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The 2016 Eastern Bering Sea Continental Shelf Bottom Trawl Survey: Results for Commercial Crab Species

By

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ABSTRACT

The eastern Bering Sea bottom trawl survey has been conducted annually since 1975 by the Resource Assessment and Conservation Engineering Division of the Alaska Fisheries Science Center, National Marine Fisheries Service. The purpose of this survey is to collect data on the distribution and abundance of crab, groundfish, and other benthic resources in the eastern Bering Sea. These data are used to estimate population abundances for the management of commercially important species in the region. This document includes the time series of results from 1975 to the present. In 2016, 375 standard stations were sampled on the eastern Bering Sea shelf. The biomass estimates, reported in metric tons (t) and pounds (lb) with 95% confidence intervals (± 1.96 SE) for legal-sized males of each commercial crab stock in the eastern Bering Sea, were as follows:

Commercial crab species	2016 legal or preferred-sized male biomass (±95% CI)	
	t*	lb**
Bristol Bay District red king crab (*Paralithodes camtschaticus*)	22,424 (6,580)	49,436,415 (14,507,018)
Pribilof District red king crab	3,653 (4,980)	8,054,292 (10,979,013)
Pribilof District blue king crab (*P. platypus*)	68 (133)	149,350 (292,725)
St. Matthew Is. Section blue king crab	2,305 (1,612)	5,081,091 (3,553,166)
Southern Tanner crab (*Chionoecetes bairdi*), east 166° W	14,143 (3,707)	31,179,086 (8,171,664)
Southern Tanner crab, east 166° W ≥ 4.9 inches	10,695 (2,992)	23,578,378 (6,596,882)
Southern Tanner crab, west 166° W	31,252 (7,757)	68,898,479 (17,100,997)
Southern Tanner crab, west 166° W ≥ 4.9 inches	18,326 (5,168)	40,401,779 (11,393,507)
Snow crab, all Districts (*C. opilio*)	51,670 (10,928)	113,912,293 (24,091,861)
Snow crab, all Districts ≥ 4.0 inches	21,997 (5,482)	48,494,850 (12,086,818)

*Estimates for preferred size classes are those with sizes listed in the left column.

**Biomass estimates in pounds were derived by converting the raw length data to pounds using regressions in Table 3 prior to calculating the area swept estimates.

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INTRODUCTION

Survey History and Purpose

The eastern Bering Sea (EBS) bottom trawl survey has been conducted by scientists in the Resource Assessment and Conservation Engineering (RACE) Division of the Alaska Fisheries Science Center (AFSC), National Marine Fisheries Service (NMFS) since the early 1970s. Starting in 1975, surveys were conducted annually and were expanded beyond Bristol Bay to include the majority of the Bering Sea continental shelf with the original purpose of assessing potential resource impacts of offshore oil development (Pereyra et al. 1978). The annual collection of data on the distribution and abundance of crab and groundfish resources provides fishery-independent estimates of population abundances and biological data for the management of commercially important species in the EBS. The crab species that have historically been assessed during the survey because of their commercial importance include: red king crab (*Paralithodes camtschaticus*), blue king crab (*P. platypus*), southern Tanner crab (*Chionoecetes bairdi*), snow crab (*C. opilio*), and hair crab (*Erimacrus isenbeckii*). The common name for *C. bairdi* changed from Tanner crab to southern Tanner crab in 2005 (McLaughlin et al. 2005) but it will still be referred to as Tanner crab in this document.

Prior to 1988, the total number of stations varied and gradually increased until they were standardized in 1988 (Fig. 1). Therefore, the pre-1988 estimates provided in this document for stocks that extend northwest of the Pribilof Islands are biased as the entire stocks were not sampled. Since 1988, 376 standard stations have been included in the survey approximately covering 140,350 square nautical mile (nmi^2) area of the EBS with station depths ranging from 20 to 200 m (Fig. 2). The annual EBS bottom trawl survey begins in the northeast section of Bristol Bay in early June and approximately 4 to 6 stations are sampled each day from each of two vessels. The standard survey is completed in late July or early August at the western edge of the survey grid, northwest of St. Matthew Island. In some years when the reproductive cycle of red king crab is delayed due to colder water temperatures (i.e., 1999, 2000, 2006-2012), a small portion of the inner Bristol Bay area is resampled after the conclusion of the standard survey (see Methods). Because station Z-04 (see Fig. 2) has a limited area within a trawlable depth range, tows were often completed at the northeast corner of station Z-04 (AZ-0504). We now exclude station Z-04 (AZ-0504) for crab population estimation. Thus 375 stations are used for crab analysis rather than 376 as listed in technical reports prior to 2015.

Eastern Bering Sea Crab Stock Assessment Process

Crabs included in the federal Bering Sea and Aleutian Islands (BSAI) King and Tanner Crab Fisheries Management Plan are managed by the Alaska Department of Fish and Game (ADF&G) with federal oversight by NMFS (NPFMC, 2011a). The annual stock assessment and fishery evaluation (SAFE) report prepared by the North Pacific Fishery Management Council provides current biological, ecosystem, and economic data associated with these species. The NMFS determines the procedure for setting overfishing levels and allowable biological catch while ADF&G sets the annual total allowable catch or guideline harvest level for each crab stock. Currently, the Council's Crab Plan Team and the Scientific and Statistical Committee review the

assessment, biological, economic, and modeling data to recommend biological reference points associated with the status of crab stocks. Crab stock boundaries are defined by ADF&G management units for king crab and Tanner crab species (Fitch et al. 2012); however, the Pribilof Islands blue king crab stock boundary also includes a 20 nmi column on the east side of the management unit, which was added in 2013 to account for blue king crab bycatch. Red king crab are split into Bristol Bay and Pribilof Islands stocks and blue king crab are split into Pribilof Islands and St. Matthew Island stocks for management purposes, while Tanner and snow crab fisheries are considered single stocks but are split into separate management fishery units defined by the ADF&G Board of Fisheries using 166°W and 173°W as the boundary for each east and west unit, respectively.

This report summarizes the 2016 survey results for commercially important crab resources in the EBS. Note that area-swept estimates in this document are indices of abundance and may not match the final modeled population estimates in the SAFE reports because the models include additional population dynamics information. The results of the 2016 standard EBS bottom trawl survey are presented for these crab stocks as defined by the management units. Details of the survey design and fishing gear specifications in addition to the number and weights of the groundfish species sampled at each standard station during this survey will be reported in a separate NOAA Technical Memorandum (e.g., Lauth and Conner 2014).

METHODS

Survey Area and Sampling Logistics

The 2016 standard survey was conducted onboard the chartered fishing vessels FV *Alaska Knight* and FV *Vesteraalen*, beginning 31 May in the northeast corner of Bristol Bay, moving westward, and finishing on 26 July. Vessels sampled in close proximity to each other for much of the survey; however, some areas (e.g., Bristol Bay, St. Matthew Island Section) were sampled predominantly by one vessel (Fig. 2).

The survey stations are divided into multiple districts, which are defined by ADF&G commercial crab management units (Fig. 3). Management units are defined by registration areas and districts, which are further divided into strata with either standard or high station densities. Standard-density strata have stations centered in 20 × 20 nmi (37.04 × 37.04 km) cells while high-density strata include additional stations at the corners of the 20 × 20 nmi cells. To calculate the total area for each stock strata the area for each 20 × 20 nmi cell is assumed to be 401 nmi^2 due to the effects of a spherical projection of the flat grid surface in an area as large as the EBS.

The king crab Registration Area T in Bristol Bay (south of 58 °39 ′N and east of 168 °W) is 54,536 nmi^2 and consists of 136 stations. The king crab Registration Area Q in the Bering Sea is divided into the Northern District (north of 58° 39′ N) and the Pribilof District (south of 58° 39′ N and west of 168°W). The area for the St. Matthew Island Section of the Northern District is divided into two sampling strata: 1) a high-density 7,218 nmi^2 stratum with 28 stations (one of which is not trawlable but is included in the total area surveyed) and 2) a standard-density 11,629 nmi^2 stratum with 29 stations creating a total of 56 stations within the St. Matthew Island

Section. The area of the Pribilof District is divided into two sampling strata: 1) a high-density 10,025 nmi^2 stratum with 41 total stations and 2) a standard-density 14,436 nmi^2 stratum with 36 stations creating a total of 77 stations within the stock area. For Pribilof District blue king crab, the eastern stock boundary is 20 miles east of the Pribilof District and includes nine additional stations, as indicated in the 2013 Pribilof Islands Blue King Crab Rebuilding Plan (NPFMC 2014). High-density strata have more stations (standard, corner) per area than standard-density strata.

The fishing gear used in 2016 was identical to that of previous EBS annual bottom trawl surveys since 1982 with both vessels fishing a standard 83-112 Eastern otter trawl with an 83 ft (25.3 m) headrope and a 112 ft (34.1 m) footrope (Lauth and Nichol 2013). The codend mesh size is 8.9 cm stretched and the liner is 3.2 cm. The trawls on each vessel were rotated every 20-30 consecutive tows (~5 days) to mitigate potential impacts from changes in net configuration due to fishing. Each tow was approximately 0.5 h in duration and 1.5 nmi (2.8 km) in length at a speed of 3 knots (1.54 m sec^{-1}) (see Results for details) and conducted in strict compliance with NMFS bottom trawl protocols established by the National Oceanic and Atmospheric Administration (Stauffer 2004).

Net mensuration equipment (Marport sensors) was used to monitor the net's fishing performance during each tow. A bottom contact sensor was attached to the center of the footrope to measure bottom contact of the net at 1-second intervals. The net mensuration system also consisted of an acoustic sensor attached to the headrope and two sensors attached to the port and starboard dandylines to measure net height and width during trawling operations. The bottom contact of the footrope and GPS data were used to calculate distance fished. Fishing power was assumed to be equal between the two vessels.

Surface and bottom water temperatures along with temperature-depth profiles were collected at 6-second intervals throughout the duration of each tow using a Sea-Bird SBE-39 bathythermograph continuous data recorder (Sea-Bird Electronics Inc., Bellevue, WA) attached to the headrope of the net. The temperature measurement range of the SBE-39 is -5 to 35 ± 0.002 °C with pressure sensors measuring to a maximum depth of 1,000 ± 1 m and are calibrated every year by Sea-Bird Electronics. Bottom depth was also derived from these data by adding the net height from the net mensuration system to the headrope depth recorded by the SBE-39.

Biological Data Collection

All crab were removed from the catch, sorted by species and sex, and a total catch weight was obtained for each species. Tanner and snow crab hybrids are identified by a combination of characteristics including curve of the epistome margin, eye color, carapace shape, and space between or shape of the rostrum horns (Karinen and Hoopes 1971, Urban et al. 2002). A random subsample of the total catch occurred when an exceptionally large number (approximately > 300) of a species was caught in a tow. Subsamples varied in size and composition depending on the particular tow. The subsample may have occurred at the level of the entire catch or at the level of a particular size and sex category once the catch was sorted. The total weights of the sampled crab and non-sampled crab were recorded and an expansion factor was calculated to determine the final number of each species in the catch.

Individual crab carapaces were measured (± 0.1 mm) to provide a size-frequency distribution of each sample. Crab sizes are reported as carapace width (CW) excluding spines for Tanner and snow crab, and carapace length (CL) for all king crab and hair crab (Donaldson and Byersdorfer 2005). Since 2006, individual weights were measured for blue king crabs every year, red king crab and snow crab in odd years, and for Tanner crab in even years to add to the existing length-weight data and to monitor temporal variability in length-weight regressions. For every haul in 2016, length-weight data were collected on up to five intact Tanner crab per each of the following categories: 1) male crab, 2) ovigerous crab, and 3) non-ovigerous female crab. Because of their relative rarity, weight data were collected for all intact blue king crabs encountered that met the sampling requirements (i.e., whole, live crab without regenerating limbs). Weights were collected from representative size ranges throughout the spatial distribution of each species. Collections were regionally stratified and tally sheets ensured all size ranges were equally sampled within each region.

In the absence of specific age data, shell condition classification by length and sex is necessary for apportioning stock abundance and biomass for determination of stock status, analytical stock assessment, and for establishing annual management controls. Shell condition class serves as a semi-quantitative index of molt status and time in shell post-molt. For all EBS crab stocks, and particularly those which exhibit a terminal molt at maturity (i.e., *Chionoecetes* spp.), shell condition is a requisite for setting overfishing limits and harvest quotas. Carapace shell condition was assessed for each crab sampled and assigned to one of six classes according to specific criteria (0 = premolt or molting, 1 = soft and pliable, 2 = new hardshell both firm and clean, 3 = oldshell slightly worn, 4 = oldshell worn, 5 = very oldshell).

Clutch assessment is used to estimate spawning stock biomass and overall reproductive health and to monitor demographic changes in the mating population. All female crab abdomens were evaluated to determine reproductive condition based on the color of the eggs (0 = no eggs, 2 = purple, 3 = brown, 4 = orange, 5 = purple-brown, 6 = pink), the condition of the eggs (0 = no eggs, 1 = uneyed, 2 = eyed, 3 = dead, 4 = empty egg cases), and the size of the egg clutch (0 = immature, 1 = mature female no eggs, 2 = trace to 1/8, 3 = 1/4, 4 = 1/2, 5 = 3/4, 6 = full).

For mature females, egg clutch and egg condition codes were used to identify the stage in the molt-mate cycle, where the presence of eyed embryos, empty egg cases, or absence of eggs (barren, hereafter) in morphologically mature females were indications of an incomplete cycle while mature females brooding uneyed embryos indicated completion of the cycle. The ratio of females with eyed embryos, empty egg cases, and old shell barren to uneyed embryos was derived as a measurement of the molt-mate cycle progression during the survey.

Understanding reproductive biology is critical for managing crab stocks in the Bering Sea. Spatiotemporal variability in reproductive potential including fecundity, sperm reserves, and reproductive condition likely regulates fluctuations in population abundances. Yet, most stock assessment models use spawning stock biomass (i.e., number and average weight of mature animals), but not embryo production, which can lead to different perceptions of productivity (Trippel 1999, Swiney et al. 2012). In recent years, egg clutches for red king crabs in Bristol Bay and *Chionoecetes* spp. throughout the eastern Bering Sea were collected during the survey to

support process studies to assess female reproductive potential. Red king crab and snow crab fecundity varies interannually and spatially likely due to demographic variability in crab age as measured by size and shell condition (Rugolo et al. 2005, Swiney et al. 2012). Starting in 2012, mature female red king crab samples were collected (even years only) throughout their distribution to monitor fecundity changes over time. Future analyses will consider the correlations of reproductive potential with demographic and environmental patterns.
In addition, mature female *Chionoecetes* spp. with shell condition 1-3 were collected in collaboration with ADF&G (see Table 4).

Maturity in male *Chionoecetes* spp. can be defined by morphometric characteristics of the chela where morphometrically immature and mature crab are separated into two morphometric groups based on the frequency distribution of the chela height (large claw or small claw) to carapace width ratio (Stevens et al. 1993, Tamone et al. 2007). To assess the difference between morphometric maturity and true functional maturity, additional special projects have been conducted in recent years. As standard sampling protocol, chela height and carapace width measurements were taken for male Tanner crabs during even years starting in 2008, while chela height and carapace width measurements for male snow crabs were taken in odd years starting in 2009. In 2016, chela height and carapace width measurements (± 0.1 mm) were collected from a subsample (typically < 15 crab per haul) of male Tanner crab caught at each station.

Bitter crab syndrome is caused by a parasitic dinoflagellate, *Hematodinium* sp., and is found in Tanner and snow crab throughout Alaskan waters (Meyers et al. 1996). The mortality rate of parasitized crabs is believed to be high and symptoms include lethargy, pink carapace pigmentation, and white opaque hemolymph (Meyers and Burton 2009a). Meats of parasitized crabs are harmless to humans, but are bitter tasting making the crabs unmarketable. The prevalence of bitter crab syndrome fluctuates temporally and spatially between *Chionoecetes* spp. in the eastern Bering Sea (Meyers et al. 1996) and may be affected by changes in environmental conditions (Morado et al. 2010). Black mat syndrome is caused by a parasitic fungus, *Trichomaris invadens*, and was prevalent in the 1970s and 1980s throughout Alaskan waters, primarily infecting Tanner crab, but does not pose human health concerns if infected Tanner crab meat is consumed (Meyers and Burton 2009b). Infected crabs have a dense, hard, black, tar-like covering over parts of the exoskeleton, which invades internal tissue causing destruction of the host (Meyers and Burton 2009b). Infections can prevent molting, cause blindness if eyestalks are infected, or result in mortality depending on the severity of the infection. Infected sub-legal crabs could fail to reach legal size or sexual maturity. All crab carapaces were scanned for evidence of bitter crab syndrome and black mat fungus to understand its temporal and spatial variability. In addition, Tanner and snow crab blood samples were collected in each of three index sites, which was comprised of 10 stations per index site (20 crabs were attempted to be sampled per station). Samples were set aside for further testing by scientists in the Shellfish Assessment Program, Pathobiology group at the AFSC in Seattle, Washington.

Crab Biomass Estimates

Crab density (number nmi^{-2}) was estimated at each station for legal males, or sublegal males, as well as mature and immature males and females of each stock. Maturity and legal size classes were based on literature values and State of Alaska regulations (Table 1). The ADF&G

definitions for legal size classes (CW in inches) include spines (ADF&G 2012), while CW measurements reported in this document exclude spines (Table 1). The area swept by the trawl (nmi^2) was calculated as the product of the distance traveled while the net had bottom contact by the mean net width over the duration of the tow. Prior to 2009, data reported in this annual document used a fixed width of 15.2 m (0.008 nmi) in the area-swept calculation to maintain consistency with historical calculations of crab abundances. Since 2009, all population biomass estimates for the entire time series are calculated using the variable net width based on net mensuration data (Table 2). The effective width of the trawl typically ranges from 14.6 to 18.3 m when towing at a speed of 3 knots (Weinberg 2003; Fig. 4), and changes with the depth of the tow due to changes in scope of the trawl wire (Rose and Walters 1990). For 2016 and all historical data reported in this current document, crab densities were calculated using the mean net width recorded for the duration of each tow and a mean net width-inverse scope regression relationship was calculated when net width values were not recorded during a tow (Rose and Walters 1990). From 1975 to 1981, the net width estimates used for the area-swept calculations were derived from a single width estimate calculated each year for a particular type of trawl used during the annual survey. From 1982 to 1987, the net width used in the area-swept calculations was estimated using the inverse relationship between net scope and net width developed by Rose and Walters (1990). From 1988 to 2016, the net width was estimated using the net mensuration system described above, which measures the height and width of the net throughout the duration of the tow (Table 2, Fig. 4). Distance traveled by the trawl was determined from ship GPS positions recorded at the beginning and end of each tow.

All reported historical data and the current biomass estimates are calculated for the number of individual male and female crab species at each 1 mm size category using the weight-size relationships developed by the AFSC's Kodiak Laboratory (Table 3). The size-weight relationships are described by the expression:

$$W = a\,L^{b} \quad ,$$

where W is the total weight in grams, L is either CL or CW in millimeters, a is the intercept in log scale and b is the slope. Parameters a and b for the size-weight relationships are estimated from a linear regression fitted to log-transformed size-weight data collected between 2000 and 2009.

The weights calculated at each 1 mm size category are summed within the legal male, sublegal male, mature and immature size categories for each species and sex caught at a station. The crab biomass within a district or section stratum was estimated by averaging crab densities from all stations within the defined district or section stratum and multiplied by the total area of the district or section stratum specific to that stock. Total biomass was calculated using a stratified design based on management units (standard density, high density, ADF&G-defined districts, or section stratum). Population biomass estimates were calculated in each stratum and then summed among strata. Variance of the total biomass estimate for each size class was calculated by summing the variance of each stratum. The 95% confidence intervals were calculated using the standard error of the total population multiplied by 1.96. All biomass estimates and confidence intervals (± 95%) reported in this document are reported in metric tons (t) except in the Abstract where both t and pounds (lb) are reported. Metric tons can be converted to lb by multiplying the

biomass in t by 2,204.62 for comparison with ADF&G reported values of total allowable catch (TAC) and guideline harvest levels (GHL).

In years with colder than average bottom water temperatures (1999, 2000, and 2006-2012), a small number of standard Bristol Bay stations sampled at the beginning of the survey were resampled in late July to accurately assess the percentage of ovigerous red king crab females which had extruded a new clutch of uneyed embryos. Similar to the previous 2 years, 2016 average bottom temperatures at Bristol Bay stations in June were warm relative to the long term average. All ovigerous females had uneyed embryos indicating the completion of the annual reproductive cycle. As such, Bristol Bay stations were not resampled in 2016.

The population biomass estimates reported in this document are point estimates and have substantial uncertainty due to the expanse of the area being sampled and the distributions of the resource. These point estimates are least precise for small crabs due to gear selectivity, and for females of some stocks due to crab behavior. For example, female blue king crab prefer rocky habitat, which is difficult to sample with bottom trawls. For consistent analyses and due to a lack of available data, catchability is assumed to be near or equal to one for the indices developed in this document. The stock assessment models that incorporate these survey data consider catchability when estimating abundance and biomass.

Centers of Distribution

The centers of distribution for male and female crab from 1975 to 2016 were determined by averaging the latitude and longitude of each positive tow for a particular species. Latitude and longitude were weighted by the CPUE for each size and sex class. In cold years when Bristol Bay stations were resampled (discussed in more detail below), only tows from Leg 1 were included.

Recruitment

Population fluctuations are likely influenced by variations in recruitment strength. Thus, assessing temporal variability in abundances of new individuals reaching the minimum legal size is important to predict the following season's catches. The term "recruitment" can refer to various life history stages including newly settled juveniles, individuals reaching sexual maturity, or individuals reaching the legal size limit. For the purposes of this technical memorandum, "pre-recruits" are defined as mature male crabs in the size class that will likely enter the fishery (minimum legal size limit) the following year, also referred to as "P1" crabs by some stock assessment authors (Table 1). A time series of pre-recruit abundance estimates are provided as an index for future abundances of legal crab.

RESULTS

Survey Overview

The 2016 EBS bottom trawl survey consisted of 376 total bottom trawls (375 used for this crab

analysis) conducted from 31 May to 26 July over an area of approximately 140,350 nmi^2 beginning in the southeast corner of Bristol Bay, moving east to west and finally moving from the stations northwest of St. Matthew Island to the stations along the slope edge south. The latitude and longitude of the midpoint of each successful tow along with the duration (h), distance fished (km), bottom depth (m) and bottom temperatures (°C) are listed in the Appendix. The mean distance fished across all tows was 1.53 nmi (2.83 km, SD = 0.10 nmi) with a range of 0.76 to 1.77 nmi (1.41 to 3.27 km) and the mean tow duration was 30.8 minutes (SD = 1.78 min, range = 16.0 to 34.2 min). The fishing depth of the 83-112 Eastern otter trawl ranged from 18 to 192 m with a mean gear depth of 78.9 m (SD = 34.1 m). The mean net width per tow ranged from 13.5 to 18.8 m and the average mean net width for all 375 successful tows was 16.5 m (SD = 1.01 m, Fig. 6). The 2016 net fishing performance (distance fished, tow duration, gear depth, net width) was consistent with previous years with the exception of 1975, when tow duration was 60 minutes and mean distance fished was 2.26 ± 0.18 nmi.

The bottom temperature at each station during the standard survey ranged from -1.5 °C to 9.9 °C (Fig. 5). A cold pool of water < 2°C extended onto the middle shelf between the 50 and 200 m isobaths to approximately 60 nmi south of St. Matthew Island, which was retracted relative to previous years. Warmer bottom temperatures were evident around the Pribilof Islands and in shallow waters around Nunivak Island and in Bristol Bay. Cold water temperatures persisted in the northwestern area between the 50 and 200 m isobaths and the waters surrounding St. Matthew Island. In 2016, the average bottom water temperature during the first survey leg (31 May to 16 June) was 6.0 °C (SD = 1.3), over one degree warmer during the same time period compared to 2015, which was one of the warmest years of the entire survey. For the third consecutive year, average bottom and surface temperatures were warmer in both Bristol Bay and the rest of the eastern Bering Sea relative to recent years (Fig. 6).

Population abundance and biomass of the seven commercial crab stocks sampled during this survey fluctuated dramatically from 1975 to 2016 (Figs. 7-12). Overall commercial crab mature male biomass decreased from approximately 300,000 t to below 100,000 t in the mid-1980s, increased to just below 500,000 t in the early 1990s due to increases in snow and Tanner crab, leveled out around 200,000 t between 2005 and 2015, but dropped to approximately 100,000 t in 2016 (Fig. 7).

Six special projects were conducted in addition to the standard assessment survey to collect specific biological data from particular crab species (Table 4). Four of the projects originated from the AFSC: 1) collect Tanner and snow crab blood samples at three index sites to monitor bitter crab syndrome, 2) collect female snow crabs to assess annual versus biennial reproductive cycles, 3) ocean acidification effects on red king crab, and 4) collect ovigerous female snow crabs for laboratory larval and juvenile growth studies. Two projects originated from ADF&G: 1) collection of snow, Tanner, and Tanner hybrid crabs for the evaluation of reproductive potential, and 2) collection of snow crab specimens for age determination studies.

Five hundred and thirty nine snow crab and 231 Tanner crab blood samples were collected from six index sites to monitor bitter crab syndrome. Approximately 600 snow crabs were collected for the annual versus biennial reproduction study. Fifty five ovigerous female red king crabs were collected for the ocean acidification effects project. Fifteen ovigerous female snow crabs

and fifteen ovigerous female Tanner crabs were collected for growth studies. Two hundred and sixty three mature female snow crab, 62 mature female Tanner crab, and 12 mature female *Chionoecetes* spp. hybrid crab were collected to assess female reproductive potential. One hundred and twenty snow crab were collected for the age determination project. All collections were completed within the guidelines stipulated by the ADF&G collection permit for each project (CF-16-010(1), CF-16-054, CF-16-092, CF-16-100, CF-16-011).

Bristol Bay District Red King Crab

Red king crab were caught at 73 of the 136 stations in the Bristol Bay management district in 2016. Similar to historical trends over the last 30 years, Bristol Bay red king crab were caught at an average depth of 61.8 m (SD = 14.9 m). The density of legal-sized male crab caught at a station ranged from 66 to 1,073 crab nmi^{-2} (see Appendix). Legal-sized male Bristol Bay red king crab were caught at 55 stations (Table 5; Appendix), resulting in a total biomass estimate (± 95% CI) of 22,424 ± 6,580 t (Table 6) and a total abundance estimate (± 95% CI) of 7.1 ± 2.1 million crab (Table 7) in the Bristol Bay District. The majority of mature males were concentrated in the central and southern section of Bristol Bay along the Alaska Peninsula (Figs. 13-15). The 2016 estimated biomass of legal-sized males is lower than last year, and lower than the 20-year average of 28,378 ± 4,626 t (Table 6).

Red king crab mature males were encountered at 59 of the 136 surveyed stations with no one station dominating in abundance (Fig. 15). One hundred percent of the 302 mature males and 153 immature males caught were measured (Table 5). The estimated biomass of 25,481 ± 7,302 t for mature males is 92% of the total male biomass in 2016 (Table 6) with immature male red king crab estimated at 2,077 ± 1,052 t (Table 5). The majority of both size categories were located in the central and northern Bristol Bay District (Figs. 14 and 15).

In 2016, an overall decrease in male red king crabs was observed compared to last year (Fig. 16). Forty-eight percent of legal-sized males were new hardshell crabs and 52% were oldshell and very oldshell crabs with the majority of oldshell males caught in central Bristol Bay (Fig. 17).

One objective of this multi-species bottom trawl survey is to assess the mature red king crab population when mature females are carrying newly extruded, uneyed embryos after completion of the molt-mate cycle (Otto 1986). Embryo development and larval hatching in female red king crab, followed by the molting and mating cycle, are delayed in years with cold bottom water temperatures (Chilton et al. 2010, Shirley et al. 1990, Stevens and Swiney 2007, Dew 2008). During years with colder than average bottom temperatures (1999, 2000, and 2006-2012), the ratio of eyed to uneyed embryos encountered in mature females on the survey in June was higher compared to warmer years (2001-2005, 2013-2016) (Table 8). The eyed to uneyed embryo ratio ranged from 6.54 to 0.42 in cold years, compared to 0.06 to 0.00 in the warmer years.

The determination that the molting and mating cycle has been delayed is made when high numbers of oldshell mature females either brooding eyed embryos, which were fertilized from the previous season, or with pleopods exhibiting empty egg cases, are encountered during the first leg of the survey. To determine whether it is necessary to tow the Bristol Bay red king crab

stations again, the reproductive condition of the mature female red king crab and the change in abundance of males and females between survey legs during cold years are assessed.

The relatively warm water temperatures in 2016 did not delay the molting and mating cycle in mature female red king crab. Seven hundred and sixty four of the 767 mature females sampled during the standard survey had extruded a new clutch of uneyed embryos, while 3 mature females had empty egg cases (Table 8). Average bottom temperature of Bristol Bay stations with mature female red king crab in June was 5.7 °C in 2016, which is over one degree warmer than the same time period in 2015, which was one of the warmest years in survey history. Bristol Bay stations were not resampled in 2016.

The 2016 mature female red king crab biomass estimate of 33,370 ± 17,051 t (Table 6) and abundance estimate of 22.4 ± 11.6 million crabs (Table 7) is 86% of the total female abundance with immature female red king crab biomass estimated at 772 ± 871 t (Table 6). The majority of the mature female red king crab were caught in the central area of Bristol Bay and along the Alaska Peninsula (Figs. 14 and 18).

Historically, most mature red king crab collected during the survey were new hardshell crabs (Fig. 19). Generally, a portion of the male population is in the old or very old shell condition, while almost all of the mature females have been new hardshell (Fig. 19). In 2016, 99% of female red king crab had new shells and 99% of mature females had clutches of uneyed eggs that were either 75% or 100% full (Fig. 20), which is encouraging because it shows high mating success.

Spatial distribution of red king crabs have fluctuated since the start of the survey. The centers of distribution for mature male and female red king crab shifted north and east of the southwest Bristol Bay region from 1980 to 1987 (Fig. 21). From 1988 to 1991, the mature female distribution slightly shifted south before returning to the northeastern distribution while males remained in the northeast. Loher and Armstrong (2005) hypothesized that the shift during the late 1970s and early 1980s was due to warmer bottom temperatures. Yet an alternative hypothesis suggests the disappearance of the southwestern portion of the population near the Unimak region during the late 1970s and early 1980s was caused by fishing effects (Dew, 2005). In more recent years when the cold pool extended onto the Bristol Bay shelf area (from 2008 to 2012), the distribution of mature females and males moved from the central area of Bristol Bay to the nearshore areas along the Alaska Peninsula supporting the temperature hypothesis (Chilton et al. 2010). This may be because females avoid water cold enough to delay embryogenesis during brooding (Stone et al. 1992). The centers of distribution for mature males and females in 2016 was approximately 20 nmi north relative to the previous two years (Fig. 21). While 2015 and 2014 were also relatively warm compared to the long term average, 2016 was an especially warm year, thus it is unsurprising crabs were distributed farther north.

The location of ovigerous females at larval release may impact post-larval settlement success and recruitment strength in subsequent years. Given the known current structure in Bristol Bay, larvae released from females located in southwestern Bristol Bay would have a higher likelihood of settling in inner Bristol Bay. A northward shift in adult spatial distribution may reduce larval supply along the Alaska Peninsula and in inner Bristol Bay which is likely more favorable for

juvenile survival than elsewhere in Bristol Bay (McMurray et al. 1984, Zheng and Kruse 2006). If this hypothesis is correct, reduced settlement success in warm years relative to cold years (Evans et al. 2012) may explain population trends over the past several decades. Year-class strength was high during the 1970s and early 1980s, but has been generally low since 1985 (Figs. 22 and 23). High abundances in the 1970s occurred when the spawning stock was located in southern Bristol Bay (Armstrong et al. 1993), while the low abundances starting in the mid-1980s may be caused by the warmer bottom temperatures and potentially related adult spatial shift. Despite relatively cold years in 2008-2012 and an extended cold pool, estimated population abundance has been low in recent years. A strong juvenile size group (40 mm to 50 mm CL size category) was observed in 2011 and could be associated with the colder temperatures in 2008-2012. The strong 2011 juvenile size class was not observed in 2012 or 2013, but relatively high abundances of females appeared in the 110-120 mm size class in 2014, which may be attributed to the strong juvenile size group seen in 2011 (Figs. 22 and 23). The 2016 mature male and pre-recruit population abundance estimates were lower compared to 2015. Mature female estimates are higher in 2016 compared to 2015, but still below the 20-year average of 26.2 ± 3.7 million crabs.

Pribilof District Red King Crab

Historically, red king crab were not abundant in the Pribilof District and landings were taken incidentally during the blue king crab fishery. The red king crab fishery first opened in 1993 while fishing for blue king crab was closed. A combined fishery for red and blue king crab occurred in the Pribilof District from 1995 through 1998, but due to low abundance of blue king crab, the combined fishery and the red king crab fishery have both remained closed since the 1998-1999 season (Gish 2006).

Red king crab were caught at 7 of the 77 stations in the Pribilof District, all of which were in the high-density sampling area in 2016 (Fig. 24). Pribilof District red king crab were caught at an average depth of 63.6 m (SD = 3.1 m), which is slightly deeper than the long term average (56.0 m). The density of legal-sized males caught at a station ranged from 73 to 3,007 crab nmi^{-2} (Appendix). Legal-sized male red king crab were caught at 5 of the 77 stations in the Pribilof District (Table 5) with a biomass estimate (± 95% CI) of 3,653± 4,980 t (Table 9) and an abundance estimate (± 95% CI) of 1.0 ± 1.5 million crab (Table 10). Legal-size males represented 78% of the total male biomass and were above the average of 6,480 ± 2,410 t from the previous 10 years (Table 9).

Mature males were encountered at 5 of the 77 stations in the Pribilof District, all of which were in the high-density sampling area (Fig. 25). All of the 69 mature and 26 immature males caught were measured (Table 5). Three stations accounted for 96% of all mature red king crab caught (Fig. 26). The biomass estimate of mature males was 4,150 ± 5,700 t and represented 89% of the total male biomass (Table 9) with the remaining 11% represented by 526 ± 693 t of immature male red king crab (Table 5). Mature males were distributed around St. Paul Island in the nearshore shallow water stations and to the north, south, and east of St. Paul Island (Figs. 25 and 26).

The 2016 size-frequency for red king crab males shows considerably fewer newshell legal-sized males compared to 2015 (Fig. 27). In 2016, 66% of the legal-sized males were new hardshell crabs and distributed around St. Paul Island. Thirty-four percent of the legal-sized males were in oldshell and very oldshell condition and primarily distributed to the east and south of St. Paul Island (Fig. 28).

The 2016 biomass estimate of mature red king crab females was 1,873 ± 2,241 t and abundance was 1.3 ± 1.4 million crab, representing 99% of the total female biomass collected during the survey (Tables 9 and 10). Female biomass estimates are imprecise due to the limited number of tows with positive crab catches (Appendix; Fig. 24), yet 2016 estimates indicate mature female biomass is slightly higher than the average over the last 10 years (Fig. 11). Ninety-eight percent of the mature females were new hardshell between 90 and 170 mm CL and 97% of the mature females were carrying either 75% or 100% full clutches of uneyed embryos (Fig. 29).

The centers of distribution for both males and females have moved within a 40 nmi by 40 nmi region around St. Paul Island (Fig. 30). The center of the red king crab distribution moved to within 20 nmi of the northeast side of St. Paul Island as the population abundance increased in the 1980s and remained in that region until the 1990s. Since then, the centers of distribution have been located closer to St. Paul Island. 2016 centers of distribution were located slightly farther away from St. Paul Island toward the north east.

Specific mechanisms for population fluctuations are unknown for Pribilof District red king crab. However, it is generally acknowledged that climate change impacts marine ecosystems, including Bering Sea crab and fish species. A climatic regime shift took place in the North Pacific Ocean during the winter of 1976-77, which was characterized by an abrupt transition from a negative to positive Aleutian Low Pressure Index (ALPI) and Pacific Decadal Oscillation (PDO) resulting in warmer air and sea surface temperatures relative to pre-1977 conditions. After the 1977 regime shift, a slight increase in Pribilof District red king crab occurred followed by a larger increase in the 1990s (Figs. 31 and 32). Male and female Pribilof red king crabs decreased in 2016, with a slight increase in male pre-recruits. However, the increase in pre-recruit abundance should be interpreted with caution due to the high variability in the population estimates.

Pribilof District Blue King Crab (including total stock boundary)

Blue king crab were caught at 11 of the 86 stations in the Pribilof stock boundary area; all in the high-density sampling area in 2016 (Fig. 33). Pribilof District blue king crab were caught at an average depth of 68.4 m (SD=3.7 m), which has been similar over the last 30 years. The 2016 biomass estimate (± 95% CI) of legal-sized males was 68 ± 133 t (Table 11) and abundance was 0.02 ± 0.38 million crab (Table 12), representing 34% of the total male abundance and well below the average of 898 ± 469 t for the previous 20 years (Tables 11 and 12).

Blue king crab mature males were caught at three of the 86 stations in the Pribilof stock boundary area and all of the three mature males and five immature males caught were measured (Table 5; Fig. 34). The mature male biomass estimate of 129 ± 154 t represents 88% of the total male biomass with 70 ± 67 t of immature male blue king crab estimated in the Pribilof stock

boundary area (Tables 5 and 11). All male blue king crab were captured to the north and east of St. Paul Island (Figs. 34-37).

Nineteen mature female blue king crab were caught in the Pribilof stock boundary area high-density sampling area which extrapolated to a biomass estimate of 352 ± 340 t (Table 11) and an abundance estimate of 0.36 ± 0.37 million crab, and represents 88% of the total female biomass. Estimates of female biomass are imprecise due to their preference for rocky habitat which is difficult to sample with bottom trawls. Blue king crab females are predominantly biennial spawners with only a portion of the female population carrying eyed embryos in a given year, while the remainder are in a non-embryo-bearing phase (Somerton and Macintosh 1985). Sixteen of the 19 mature female blue king crab sampled in the Pribilof stock boundary area were brooding uneyed embryos and three had empty egg cases (Fig. 38). All of the females with embryos had 100% full clutches (Fig. 38).

The centers of distribution for both males and female blue king crab are located within a 40 nmi by 40 nmi region east of St. Paul Island (Fig. 39). The center of the blue king crab distribution moved to within 20 nmi of the northeast side of St. Paul Island as the population abundance decreased in the 1980s before moving easterly in the 1990s. In 2016, the mature male and female centers of distribution were located approximately 25 nmi east of St. Paul Island.

Pribilof blue king crab production was higher in the late 1970s and early 1980s, and increased in the 1990s with female abundances at an all-time high in 1980 (Figs. 40 and 41). A pulse of male and female blue king crabs in the 55-60 mm CL size class was seen in 2005, yet this cohort was not observed at elevated abundances in subsequent years. Overall male and female blue king crab abundances have been extremely low in recent years with no evidence of increasing.

St. Matthew Island Section, Northern District Blue King Crab

The blue king crab fishery in the St. Matthew Island Section of the Northern District opened in 2009 after a 10-year rebuilding plan but was closed due to ADF&G harvest regulations in 2013. Blue king crab were caught at 16 of the 56 total stations in the St. Matthew Island Section sampling strata; 15 stations in the high density area, and one station in the standard density area (Fig. 42). St. Matthew Island blue king crab were caught at an average depth of 68.9 m (SD = 21.2 m), which is slightly shallower than the long-term average depth (72.5 m; SD=21.8 m). Fifty two legal-sized male blue king crab were caught in 2016 with a biomass estimate (± 95% CI) of 2,305 ± 1,612 t (Table 13) and abundance estimate (± 95% CI) of 1.2 ± 0.9 million crab (Table 14) representing 64% of the total male biomass which is below the average of 3,002 ± 839 t from the previous 20 years (Table 13).

Mature male blue king crab were caught at 16 of the 56 stations surveyed in the St. Matthew Island Section sampling strata and 100% of the 83 mature and 38 immature males caught were measured (Table 5, Figs. 43 and 44). Historically, one station (R-24) has greatly impacted population estimates for St. Matthew Island blue king crab. In 2016, only 17% of the mature males were caught at R-24, compared to 68% in 2015 (Fig. 44). The mature male biomass estimate in 2016 was 3,072 ± 2,273 t, representing 86% of the total male biomass (Table 13),

while the immature male biomass was estimated at 509 ± 632 t (Table 5). The majority of the immature male blue king crab were distributed within the 100 m isobath south of St. Matthew Island while the majority of mature males were caught south of St. Matthew island, with the exception of one station (R-24) north of St. Matthew Island, where 17% of the mature male were caught (Figs. 43 and 44).

Overall St. Matthew Island blue king crab male abundance decreased in 2016 compared to 2015 and 2014, including newshell and oldshell crabs (Fig. 45). In 2016, 72% of the legal-sized males were new hardshell crabs, and the two stations with the highest catches were nearshore to the north (R-24) and south (QP2423) of St. Matthew Island (Fig. 46).

The 2016 mature female blue king crab biomass estimate was 129 ± 104 t and abundance was 0.27 ± 0.23 million crab (Table 14), representing 100% of the total female biomass (Table 13). Mature females were caught at six stations in the St. Matthew Island Section sampling strata (Fig. 43). Of the twelve mature females, nine were new hardshell crabs with no eggs, one was an oldshell crab with no eggs, and two were oldshell crabs with empty egg cases (Fig. 47).

The centers of distribution for both males and female blue king crab are located within a 30 nmi by 30 nmi region around St. Matthew Island (Fig. 48). The center of the blue king crab distribution has randomly moved within this region without a clear pattern of years proximal to each other. In 2016, the mature male and female centers of distribution were located approximately 10 nmi south of St. Matthew Island (Fig. 48).

NMFS survey abundance estimates for St. Matthew blue king crab do not exist prior to 1978. As such, production cannot be compared before or after the 1977 regime shift. Size distribution abundance estimates (Figs. 49 and 50) suggest that production of male crabs has been relatively stable in recent years. In 2016, the abundance of pre-recruit male crab in the 105-119 mm size class was low compared to 2015 and 2014, and below the previous 20-year average (Fig. 12). The high variability suggest trends should be interpreted with caution. It is important to highlight that recent fluctuations in population abundance estimates are primarily caused by catch numbers in one station (R-24).

Tanner Crab

In 2011, the ADF&G Board of Fish changed the legal-size limit of Tanner crab from ≥ 5.5 inches CW (138 mm, without spines) to ≥ 4.4 inches CW (110 mm, without spines) west of 166°W and ≥ 4.8 inches CW (120 mm, without spines) east of 166°W (Table 1). According to the regulatory harvest strategy of the State of Alaska (5 AAC 35.508), the annual TAC or GHL for Tanner crab in both areas is determined by the biomass estimate of males ≥ 125 mm CW. The harvest strategy is based on the assumption that the commercial fishery will target legal size crab (Zheng and Pengilly 2011), although the industry may self-impose retention of crab ≥ 4.9 inches CW (125 mm, without spines) east and west of 166°W. We provided the 2016 biomass estimates for the two legal-size categories as well as for ≥ 4.9 inches CW east and west of 166°W in the abstract.

Tanner crab were caught at 107 of the 120 stations east of 166°W and 161 of the 255 stations west of 166°W with Tanner crab occurring at 41 and 8 stations in the high-density areas of the Pribilof District and St. Matthew Island Section, respectively (Appendix; Fig. 51). Tanner crab were caught at an average depth of 75.2 m (SD = 23.4 m) east of 166°W and 106.5 m (SD = 32.6 m) west of 166°W, which has been similar for the entire time series.

Legal-sized Tanner crab were caught at 93 of the 120 stations east of 166°W and 108 of the 255 stations west of 166°W (Table 5, Fig. 52). All of the legal-sized males caught east of 166°W were measured and 96% of the legal-sized males caught west of 166°W were measured (Table 5). The 2016 biomass estimate (± 95% CI) for legal male Tanner crab east of 166°W was 14,143 ± 3,707 t (Table 15) and abundance was 20.2 ± 5.3 million crab with 69% of those males ≥ 4.9 inches CW with a biomass estimate of 10,695 ± 2,992 t (13.9 ± 3.8 million crab; Tables 15 and 16). The 2016 biomass of legal Tanner crab in the eastern area was above the 20-year average biomass of 12,220 ± 3,121 t. The majority of the Tanner males ≥ 113 mm CW east of 166°W were distributed in the southwest section of Bristol Bay (Figs. 52 and 53).

The 2016 biomass estimate for legal male Tanner crab west of 166°W was 31,252 ± 7,757 t (Table 17) and abundance was 51.3 ± 12.6 million crab with 48% of those males ≥ 4.9 inches CW with a biomass estimate of 18,326 ± 5,168 t (24.7 ± 6.7 million crab; Tables 17 and 18). The 2016 biomass of legal Tanner crab in the western area was well above the 20-year average biomass of 14,985 ± 4,820 t. The majority of Tanner males ≥ 103 mm CW west of 166°W were distributed around the Pribilof Islands (Figs. 52 and 53).

In 2016, a total of 1,366 male Tanner crab chela height measurements were collected on the EBS bottom trawl survey. The scatterplot of the allometric relationship between chela height and carapace width using data collected in 2008, 2010, 2012, 2014, and 2016 (n = 6,822 for all years combined) graphically represents two distinct maturity groups: immature, small claw males with a ratio of less than 0.18 and mature, large claw males with a ratio greater than or equal to 0.18 (Fig. 54). The carapace widths for small claw males ranged from 10.0 to 152.3 mm compared to 61.4 to 177.1 mm for large claw males. Large claw males with carapace widths below the legal-size limit will not recruit to the fishery in the future, as morphometrically mature male *Chionoecetes* spp. crab will not molt again during their lifespan (Tamone et al. 2007).

In the areas east and west of 166°W, overall newshell males decreased slightly (Figs. 55 and 56). In both areas, most male crabs above 100 mm CW had similar proportions of new and oldshell, and were distributed in the southwest section of the EBS shelf at depths greater than 50 m (Fig. 57).

The 2016 mature female Tanner crab biomass estimate east and west of 166°W was 1,429 ± 850 t and 6,076 ± 3,664 t (7.7 ± 4.7 and 42.6 ± 27.3 million crabs), respectively, while the immature female Tanner crab biomass east and west of 166°W was 50 ± 32 t and 1,057 ± 462 t, respectively (Tables 5, 15-18). Nine-teen percent of the mature female population was distributed east of 166°W in the ADF&G Eastern management district in the central and southwestern area of the Bristol Bay District (Fig. 52). In the eastern area only, less than 1% of the mature females were softshell, while 13% were new-hardshell and 87% were oldshell and

very oldshell (Fig. 58). In the western area only, less than 1% of the mature females were softshell, while 20% were new-hardshell and 79% were oldshell and very oldshell (Fig. 59). In the eastern region 95% of the mature females carried newly extruded embryos while 5% were brooding eyed embryos, had not produced a new clutch, or were barren (Fig. 58). In the western region, 95% of the mature females carried newly extruded embryos, while less than 1% were brooding eyed embryos and 5% had empty egg cases or were barren (Fig. 59). In the eastern region, 9% of the mature females were 1/2 full, 33% were 3/4 full, and 54% were full, while in the western region 8% were 1/2 full, 28% were 3/4 full, and 51% were full (Figs. 58 and 59).

Pulses of strong recruitment to the mature male and female population appear to have been cyclical throughout the eastern Bering Sea (Figs. 60 and 61), yet it is unclear what environmental conditions triggered the pulses, or if strong cohorts are sequentially linked as theorized for snow crab (Ernst et al. 2005, Ernst et al. 2012, Parada et al. 2010). Shell condition can be used to infer if mature female Tanner crab are primiparous (first clutch of eggs) or multiparous (subsequent clutches). For example, mature newshell female crabs (shell condition 2) are assumed to be primiparous (first clutch of eggs) and likely molted to maturity during the prior winter (Ernst et al. 2005).

The shell condition time series demonstrates that the survey fails to detect portions of the population. For example, the population estimate of newshell (shell condition 2) female Tanner crab east of 166°W was 37 million in 1990, yet the estimate of oldshell (shell condition 3) mature females was 76 million in 1991 (Fig. 60). Assuming newshell females become oldshell the following year, estimates of oldshell females should be at or below levels of newshell females the year prior. Further, the shell condition time series for mature male Tanner crab should be interpreted with caution, as physiological, morphological, and functional male maturity vary by size. In most of the historical survey data, it is not possible to differentiate morphologically mature and immature males. Thus, a size cutoff is suboptimal for assessment of mature crabs, and future research will strive to refine the accuracy of estimating mature population abundances.

The centers of distribution for both males and female Tanner crab have moved within a 160 nmi by 100 nmi region east of the Pribilof Islands and west of Bristol Bay (Fig. 62). The center of the distribution moved from the eastern extent of the distribution in the 1970s to the western extent in more recent years.

There is little evidence of changes in Tanner crab production related to the 1977 regime shift (NPFMC 2011b), yet pulses of strong production have been cyclical from 1975 to the present (Figs. 63-66). A less pervasive regime shift occurred in 1989, as characterized by briefly negative ALPI and PDO indices, but the system did not return to pre-1977 conditions. A slight increase in Tanner crab production coincided with the 1989 shift, although the links between climate and crab production remain speculative. Male pre-recruit abundance both east and west of 166°W was similar relative to 2015, and levels are above the average over the past 20 years (Fig. 12). The male size frequency distribution in 2014 reveals an increase in abundance of male crabs between 100 and 125 mm CW west of 166°W, which may be related to the slight increase of crabs between 120 and 140 mm CW in 2015 and 2016 (Figs. 63-66).

Snow Crab

Although the legal minimum size limit for male snow crab is 3.1 inches CW (78 mm), processors currently prefer a minimum size of 4.0 inches CW (102 mm). The biomass estimates for male snow crab are reported for both legal and preferred size categories in the abstract.

Snow crab were caught at 241 of the 375 stations in the combined areas of the Bristol Bay District, Pribilof District, and St. Matthew Island Section sampling strata (Fig. 67). Snow crab were caught at an average depth of 84.5 m (SD = 22.0 m), which has been similar for the entire time series.

Legal-sized snow crab were caught at 206 of the 375 standard stations and 84% of the legal-sized males caught were measured (Table 5). Legal-sized male snow crab estimated biomass (± 95% CI) was 51,670 ± 10,928 t (Table 19) and abundance was 143.2 ± 32.2 million crab (Table 20) which was 6% of the total male abundance. This biomass is much lower than the 20-year average legal male snow crab biomass of 139,519 ± 34,217 t. Forty-three percent of those legal males were ≥ 4.0 inches CW with a biomass estimate of 21,997 ± 5,482 t (37.4 ± 9.3 million crab). Males ≥ 95 mm CW were distributed throughout the EBS survey area in waters deeper than 50 m (Figs. 68 and 69).

The scatterplot of the allometric relationship between chela height and carapace width using the data collected in 2009 (n = 1,303), 2011 (n = 1,130), 2013 (n = 943), and 2015 (n = 1,008) graphically represents two distinct maturity groups for snow crab; immature males (small claw) with a ratio of < 0.20 and mature males (large claw) with a ratio of ≥ 0.20 (Fig. 70). The carapace widths for small claw males ranged from 19.4 to 121.2 mm compared to 40.6 to 151.6 mm for large claw males.

An increase in the number of juvenile new hardshell males in the 30 to 75 mm size category was observed over the past 3 years; however, these strong size classes did not appear in subsequent years in larger size categories (Fig. 71). Among legal-sized male crab in 2016, less han 1% were in molting or softshell condition while approximately 54% were in new-hardshell condition and distributed between the 50 and 100 m isobaths in the middle shelf of the EBS survey area as well as between the 100 and 200 m isobaths in the northwest area of the EBS shelf (Figs. 71 and 72). Forty-six percent of the legal-sized males were oldshell and very oldshell condition crabs and primarily distributed throughout the EBS shelf between the 100 and 200 m isobaths (Fig. 72).

The mature female snow crab biomass estimate of 52,022 ± 21,010 t and abundance estimate of 818.4 ± 347.2 million crab was 49% of the total female biomass (Tables 19 and 20). The immature female crab biomass estimate was 53,788 ± 28,983 t (Tables 5 and 19). Among sampled mature females, 38% were in new-hardshell condition and 62% were oldshell and very oldshell condition (Fig. 73). Ninety-six percent of the mature females were brooding new embryos, while less than 1% had eyed embryos (Fig. 73). Three percent of the mature females had empty egg cases and 1% were barren (Fig. 73). Seventy-four percent of mature females with embryos were 75% and 100% full (Fig. 73).

Pulses of strong recruitment to the mature female population have been cyclical (Fig. 74), and it is hypothesized that strong cohorts are sequentially linked (see Ernst et al. 2012, Parada et al. 2010 for a detailed discussion). As with Tanner crab, shell condition can be used to infer if mature female snow crab are primiparous (first clutch of eggs) or multiparous (subsequent clutches). Mature newshell female crabs (shell condition 2) are assumed to be primiparous (first clutch of eggs) and likely molted to maturity during the prior winter (Ernst et al. 2005). Strong cohorts of mature primiparous females occurred approximately every 7 years starting in 1980 (Fig. 74), which matches the theoretical time required between egg extrusion of mature females and those offspring reaching maturity (Ernst et al. 2012). It is unknown what specific environmental conditions triggered the initial pulse or how long the sequence may last.

As with Tanner crab, the shell condition time series demonstrates that the survey fails to detect portions of the population. For example, population estimates of newshell (shell condition 2) female snow crab were 125 million in 1999, yet estimates of oldshell (shell condition 3) mature females was nearly 1,000 million in 2000 (Fig. 74). Estimates of oldshell females should be at or below levels of newshell females the year prior. As with Tanner crab, the shell condition time series for mature male snow crab should be interpreted with caution, as physiological, morphological, and functional male maturity vary by size, and it is not possible to differentiate morphologically mature and immature males in most survey data. Future research will strive to refine the accuracy of estimating mature population abundances.

With the exception of 1975 to 1979, the centers of distribution for both males and female snow crab have moved within a 120 nmi by 120 nmi region between St. Matthew Island and the Pribilof Islands (Fig. 75). The center of snow crab distribution moved dramatically to the northwest after 1979. Since then, the centers of distribution have moved throughout the distribution with males having a broader distribution while females are located more to the north. The 2016 mature female center of distribution was among the farthest north, located near St. Matthew Island (Fig. 75).

Mature male and female and pre-recruit-male abundance and biomass is substantially down from 2015 and 2014, and below the previous 10-year average (Figs. 8-12, 76, and 77). However, an increase in juvenile abundance over the past 3 years provides hope for strong recruitment in upcoming years (Figs. 71, 76, and 77). Ovigerous female snow crab held in water less than 1.5 °C are biennial spawners in the Bering Sea (NPFMC 2011b). Environmental conditions such as temperature and the extent of the cold pool will likely regulate recruitment strength through the numbers of biennial spawners and fecundity of females.

Chionoecetes spp. hybrid

Chionoecetes spp. hybrid crab were caught at 102 of the 375 stations in the combined areas of the Bristol Bay, Pribilof, and Northern Districts (Fig. 78, Appendix).

In this document, *Chionoecetes* spp. hybrid crab size classes for legal males and mature females are based on the size categories for snow crab (see Snow Crab section and Table 1). Legal-sized

male *Chionoecetes* spp. hybrid crab were caught at 80 stations, throughout all Districts combined, resulting in a biomass estimate (± 95% CI) of 3,894 ± 1,519 t and were primarily distributed around the Pribilof Islands between 50 and 100 m (Fig. 79). Seventy-six percent of those legal males were ≥ 4 inches in carapace width, with a biomass estimate of 2,977 ± 1,341 t. Sublegal male *Chionoecetes* spp. hybrid crab were distributed throughout the northeastern Bering Sea shelf at depths greater than 50 m (Fig. 79).

The 2016 mature female *Chionoecetes* spp. hybrid crab biomass estimate was 1,356 ± 929 t and the immature female crab biomass estimate was 26 ± 17 t. The majority of the mature female *Chionoecetes* spp. hybrid crab were primarily distributed south of the Pribilof Islands and St. Matthew Island and between 100 and 200 m in the northwestern area of the eastern Bering Sea shelf (Fig. 79). Thirty-two percent of the mature female abundance was located at one station (F-19) east of St. George Island (Fig. 78).

Other Crab Stocks and Species of Interest

Northern District Red King Crab

Red king crab were caught at 14 stations in the Northern District (Fig. 80) outside of the current management units where red king crab are commercially fished (Fig. 5). Legal-sized males were caught at 5 of those stations and the density at a station ranged from 75 to 80 crab nmi^{-2} (Appendix). The 2016 biomass estimate (± 95% CI) of legal-sized males was 450 ± 332 t while the biomass estimate of mature and immature males was 722 ± 372 and 39 ± 56 t, respectively. The biomass estimate of mature female red king crab was 452 ± 369 t. The majority of mature males and mature female red king crab were caught near the 50 m isobath at stations south and west of Nunivak Island (Fig. 80).

Northern District Blue King Crab

Blue king crab were caught at four stations not included in the blue king crab biomass estimates for the Pribilof District or the St. Matthew Island section sampling strata of the Northern District, which consisted of two mature males (137 and 107 mm CL) and two immature females (100 and 93 mm CL) (Appendix; Fig. 81).

Hair Crab

In this report, legal male hair crab are defined as > 3.25 inches CW (≥ 83 mm CL) which was specified in the previous Pribilof District fishery while the female hair crab biomass estimate is presented for all sizes combined. Hair crab were caught at 40 of the 375 stations throughout all Districts combined on the survey (Fig. 82). The 2016 density of legal male hair crab caught at a station ranged from 66 to 562 crab nmi^{-2} resulting in a biomass estimate of 716 ± 307 t (Table 21) and abundance of 1.2 ± 0.5 million crab (Table 22). Historically, hair crab have been concentrated just north of the Alaska Peninsula and near the Pribilof Islands. In 2016, legal male hair crab were primarily concentrated near St. Paul Island and distributed along the 50 m isobath near Nunivak Island (Fig. 82).

The 2016 sublegal male hair crab biomass estimate (± 95% CI) was 213 ± 102 t and the female hair crab biomass estimate was 71 ± 50 t (Table 21). Sublegal males were caught near St. Paul Island and west of Nunivak Island (Fig. 82).

The Pribilof District hair crab fishery has been closed since 2000 due to a shift in the distribution of legal males to the Northern District and, after one year of experimental fishing with minimal vessel participation, the Northern District fishery was closed in 2001 (Fitch et al. 2012). Biomass estimates of both size classes of male hair crab have been on an increasing trend between 2005 and 2013; however, the 2016 biomass estimate for legal-sized male hair crab was lower than the 20-year average of 1,995 ± 617 t (Table 21).

Golden King Crab

One 146 mm CL and one 139 mm CL newshell male golden king crab was caught at stations K-27 and L-28, respectively.

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Table 1. -- Definition of carapace size classes for crab species caught in National Marine Fisheries Service's eastern Bering Sea standard survey. Carapace length (CL) is measured for *Paralithodes* spp. and *Erimacrus isenbeckii*, while carapace width (CW excluding spines) is measured for *Chionoecetes* species. ADF&G uses size to define female maturity (presented in Table 1); however, we define female maturity based on abdominal flap morphology and egg presence throughout this document. The legal size classes defined by ADF&G (CW in inches) include spines.

Species	District		Immature	Mature	Pre-recruit	Legal Male
Paralithodes camtschaticus	Bristol Bay	male	<120 mm	≥ 120 mm	110-134 mm	≥ 135 mm CL or ≥ 6.5 in. CW
		female	< 90 mm	≥ 90 mm		
	Pribilof	male	<120 mm	≥ 120 mm	120-134 mm	≥ 135 mm CL or ≥ 6.5 in. CW
		female	< 90 mm	≥ 90 mm		
P. platypus	Pribilof	male	<120 mm	≥ 120 mm	120-134 mm	≥ 135 mm CL or ≥ 6.5 in. CW
		female	< 100 mm	≥ 100 mm		
	St. Matthew	male	< 105 mm	≥ 105 mm	105-119 mm	≥ 120 mm CL or ≥ 5.5 in. CW
		female	< 80 mm	≥ 80 mm		
Chionoecetes bairdi	East of 166° W	male	< 113 mm	≥ 113mm	113-124 mm	≥ 120 mm or ≥ 4.8 in. CW[1]
		female	< 85 mm	≥ 85 mm		
	West of 166° W	male	< 103 mm	≥ 103 mm	103-124 mm	≥ 110 mm or ≥ 4.4 in. CW[1]
		female	< 80 mm	≥ 80 mm		
C. opilio		male	< 95 mm	≥ 95 mm	95-101 mm	≥ 78 mm or ≥ 3.1 in. CW[2]
		female	< 50 mm	≥ 50 mm		
Erimacrus isenbeckii		male				≥ 83 mm CL or > 3.25 in. CW[3]
		female				

[1] The legal minimum size limit for *C. bairdi* is ≥ 4.8 inches CW (120 mm excluding spines; 122 mm including spines) east of 166° W and ≥ 4.4 inches CW (110 mm excluding spines; 112 including spines) west of 166° W (ADF&G reg. **5 AAC 35.520(b)(1)**).

[2] The legal minimum size limit for *C. opilio* is 3.1 inches CW (78 mm excluding spines; 79 mm including spines), although processors currently prefer a minimum size of 4.0 inches CW (102 mm).

[3] Legal-sized male crab for *E. isenbeckii* are larger than a minimum size of 3.25 inches CW (≥ 83 mm CL) defined by Alaska Department of Fish and Game permit guidelines.

Table 2. -- History of methods for determining trawl on bottom and estimating net width on National Marine Fisheries Service eastern Bering Sea bottom trawls.

Year	Net width (m)	Trawling methodology
1975		First and only year tow duration = 1 hour
1976-2012		Tow duration = 30 minutes
1975-1995		Brake set and haul back of winch drum wire defined trawl contact with seafloor (net on bottom)
1996-2012		Began using bottom contact sensors to determine trawl contact with seafloor
1975 - 1980	12.2	Mean width of 400-mesh eastern trawl*
1981	18.0	Mean width* of 83-112 Eastern trawl for Vessel 1
1981	13.4 or 14.3	Mean width* of 400-mesh Eastern trawl measurements different on haul 1-112 and 114-156 for Vessel 37*
1982 - 1987	Variable with each tow	Rose and Walters (1990) calculated the 83-112 net width based on an inverse relationship to net scope
1988 - 2001	Variable with each tow	All survey vessels used ScanMar acoustic sensors on the 83-112 trawl net
2001 - 2012	Variable with each tow	All survey vessels used NetMind acoustic sensors on the 83-112 trawl net
2013 - 2016	Variable with each tow	All survey vessels used Marport acoustic sensors on the 83-112 trawl net

*Single value used for net width when calculating area swept.

Table 3. -- Weight-size regression relationships used to calculate biomass of crab species caught in National Marine Fisheries Service eastern Bering Sea bottom trawl surveys.

Stock	Sex	*a*	*b*
Bristol Bay	males	0.000403	3.141334
red king crab	females	n/a	n/a
	non-ovigerous females	0.000408	3.127956
	ovigerous females	0.003593	2.666076
Pribilof Islands	males	0.000403	3.141334
red king crab	females	n/a	n/a
	non-ovigerous females	0.000408	3.127956
	ovigerous females	0.003593	2.666076
Pribilof Islands	males	0.000508	3.106409
blue king crab	females	0.02065	2.27
	non-ovigerous females	n/a	n/a
	ovigerous females	n/a	n/a
St. Matthew	males	0.000502	3.107158
blue king crab	females	0.02065	2.27
	non-ovigerous females	n/a	n/a
	ovigerous females	n/a	n/a
Tanner crab	males	0.00027	3.022134
	females	n/a	n/a
	non-ovigerous females	0.000562	2.816928
	ovigerous females	0.000441	2.898686
snow crab	males	0.000267	3.097253
	females	n/a	n/a
	non-ovigerous females	0.001047	2.708367
	ovigerous females	0.001158	2.708793
hair crab	males	0.00071731	3.02
	females	0.00119453	2.86

Table 4. -- Special projects related to crab species conducted on National Marine Fisheries Service eastern Bering Sea bottom trawl survey in 2016.

Project title	Principle Investigator	Agency
Bitter crab syndrome	Pam Jensen	RACE[1]-SAP[2]
Annual vs. biennial snow crab reproductive cycle	Kathy Swiney	RACE[1]-SAP[2]
Ocean acidification effects on red king crab	Kathy Swiney	RACE[1]-SAP[2]
Snow and Tanner crab growth	Cliff Ryer	RACE[1]-FBE[3]
Reproductive potential of female snow, Tanner, and Tanner hybrid crabs	Laura Slater	ADF&G[4]
Snow crab age determination	Joel Webb	ADF&G[4]

[1] Alaska Fisheries Science Center, Resource Assessment and Conservation Engineering Division, Seattle, Washington.

[2] AFSC, Resource Assessment and Conservation Engineering Division, Shellfish Assessment Program, Kodiak, Alaska.

[3] AFSC, Resource Assessment and Conservation Engineering Division, Fisheries Behavioral Ecology Program, Newport, Oregon.

[4] State of Alaska, Department of Fish and Game.

Table 5. -- Summary of 2016 National Marine Fisheries Service eastern Bering Sea bottom trawl survey details for seven commercial crab stocks. Size categories are defined in Table 1.

		Tows in District	Tows with crab	Crab measured	Crab caught	Biomass (t)	CI (± 95%)
Bristol Bay District	Immature male	136	32	153	153	2,077	1,052
Red King Crab	Mature Male	136	59	302	302	25,481	7,302
	Legal	136	55	241	241	22,424	6,580
	Immature female	136	18	116	116	772	871
	Mature female	136	57	767	767	33,370	17,051
Pribilof District	Immature male	77	3	26	26	526	693
Red King Crab	Mature Male	77	5	69	69	4,150	5,700
	Legal	77	5	53	53	3,653	4,980
	Immature female	77	1	2	2	26	50
	Mature female	77	5	66	66	1,873	2,241
Pribilof District	Immature male	86	4	5	5	70	67
Blue King Crab	Mature Male	86	3	3	3	129	154
	Legal	86	1	1	1	68	133
	Immature female	86	4	5	5	49	48
	Mature female	86	7	19	19	352	340
St. Matthew Is.	Immature male	56	6	38	38	509	632
Blue King Crab	Mature Male	56	16	83	83	3,072	2,273
	Legal	56	14	52	52	2,305	1,612
	Immature female	56	0	0	0	0	0
	Mature female	56	6	12	12	129	104
Tanner Crab	Immature male	120	98	816	816	6,997	3,949
east of 166ºW	Mature Male	120	99	1,011	1,011	18,523	4,755
	Legal	120	93	696	696	14,143	3,707
	Immature female	120	19	93	93	50	32
	Mature female	120	38	279	279	1,429	850
Tanner Crab	Immature male	255	155	2,708	3,147	8,196	2,624
west of 166ºW	Mature Male	255	112	2,669	2,797	35,119	8,671
	Legal	255	108	2,217	2,316	31,252	7,757
	Immature female	255	95	1,490	1,708	1,057	462
	Mature female	255	62	1,341	1,661	6,076	3,664
Opilio Tanner Crab	Immature male	375	208	12,800	86,374	103,747	37,836
	Mature Male	375	190	1,887	2,191	29,961	6,869
	Legal	375	206	4,671	5,530	51,670	10,928
	Immature female	375	126	4,816	76,105	53,788	28,983
	Mature female	375	122	5,348	30,774	52,022	21,010

Table 6. -- Time series of biomass estimates (t) for Bristol Bay District red king crab (*Paralithodes camtschaticus*) by size category (CL) and sex from the National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1977 data.

Year	Immature male < 120 mm	Mature male ≥ 120 mm	Mature male ± CI	Legal male ≥ 135 mm	Immature female	Mature female	Mature female ± CI
1978	54,371	146,682	66,417	98,241	3,795	141,265	54,370
1979	16,886	86,906	43,304	63,107	5,132	59,165	21,521
1980	37,369	129,829	65,411	106,655	7,594	73,712	46,197
1981	27,294	41,520	12,659	27,368	4,215	59,099	30,597
1982	51,268	23,038	8,656	10,184	21,932	48,913	18,738
1983	25,675	9,796	2,494	2,867	7,257	7,237	2,683
1984	79,710	16,849	8,751	7,623	38,806	17,529	14,374
1985	12,823	14,006	4,130	5,356	1,602	5,723	2,805
1986	12,382	28,189	27,164	13,033	1,847	5,062	2,860
1987	16,626	30,197	14,575	18,167	7,074	15,427	9,677
1988	9,513	25,861	9,178	19,117	1,205	18,019	14,900
1989	7,059	35,503	15,936	27,552	1,322	11,615	7,455
1990	6,344	32,481	14,786	24,527	2,871	17,995	14,579
1991	6,395	60,142	69,981	52,119	1,826	15,553	13,342
1992	6,787	18,327	6,835	13,747	1,088	11,163	5,657
1993	6,939	28,740	12,766	19,839	1,170	16,101	7,849
1994	3,601	19,775	6,740	13,371	1,104	8,283	3,558
1995	6,359	20,939	14,711	15,570	2,992	7,868	3,839
1996	9,067	18,111	7,309	15,073	5,380	12,042	6,829
1997	27,126	32,533	13,321	27,403	3,051	21,365	14,033
1998	13,035	33,297	10,450	19,409	2,161	35,849	17,889
1999	5,093	39,870	16,942	30,005	1,163	19,126	13,276
2000	6,961	31,450	10,638	22,090	2,615	26,387	18,086
2001	8,942	19,060	5,746	15,360	1,692	22,866	13,703
2002	12,113	33,359	12,655	25,241	5,150	19,144	10,306
2003	11,514	63,271	57,913	51,115	5,642	35,587	16,085
2004	27,917	63,159	54,053	53,895	6,162	34,826	18,589
2005	17,036	38,105	14,021	28,373	8,455	42,715	17,805
2006	11,756	39,808	17,766	32,148	6,521	37,005	14,306
2007	14,043	44,115	17,880	34,226	2,257	42,931	19,123
2008	15,840	51,375	35,542	38,155	1,675	44,194	28,234
2009	8,926	34,250	25,727	21,996	760	46,616	30,241
2010	5,441	33,586	16,497	24,891	535	40,951	21,869
2011	7,952	21,990	9,231	16,622	3,515	38,035	19,244
2012	5,841	24,837	13,411	19,858	2,881	27,282	17,713
2013	5,515	34,141	14,164	28,358	547	22,031	15,783
2014	12,621	48,038	17,559	36,130	1,560	50,926	22,953
2015	4,984	32,121	11,019	27,209	838	26,296	15,078
2016	2,077	25,481	7,302	22,424	772	33,370	17,051

Table 7. -- Time series of abundance estimates (in millions) for Bristol Bay District red king crab (*Paralithodes camtschaticus*) by size category (CL) and sex from the National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1977 data.

Year	Immature male < 120 mm	Mature male ≥ 120 mm	Mature male ± CI	Legal male ≥ 135 mm	Immature female	Mature female	Mature female ± CI
1978	89.5	67.9	30.7	38.5	27.8	161.3	61.9
1979	33.4	38.0	19.1	23.6	22.1	57.9	20.3
1980	70.8	51.3	25.3	37.5	34.4	87.9	66.4
1981	41.1	18.4	5.4	9.7	13.1	58.4	29.6
1982	110.9	12.0	4.9	4.0	72.4	52.9	21.8
1983	46.2	5.7	1.5	1.3	23.8	8.7	3.6
1984	164.9	9.1	4.7	3.3	109.8	27.4	23.9
1985	16.8	7.6	2.2	2.3	4.3	8.4	4.1
1986	15.2	14.8	14.6	5.6	5.2	6.4	3.6
1987	24.4	14.6	7.0	7.3	17.4	18.5	11.4
1988	11.3	11.6	4.0	7.5	2.5	20.1	17.0
1989	10.0	15.1	6.5	10.4	3.9	13.2	8.6
1990	9.7	13.7	6.1	8.9	7.8	17.0	13.8
1991	9.7	23.2	26.1	18.5	4.8	14.9	13.8
1992	8.3	7.5	3.0	4.6	2.3	10.2	4.9
1993	8.2	12.5	5.6	7.0	2.8	14.0	7.0
1994	7.1	8.6	2.9	4.8	3.8	6.1	2.5
1995	11.0	9.1	6.9	5.9	6.1	6.3	3.0
1996	17.5	7.2	2.8	5.3	14.3	9.8	5.6
1997	32.6	12.3	4.8	9.2	5.1	21.8	17.1
1998	16.8	15.4	5.0	6.8	6.3	31.7	17.5
1999	11.3	17.4	7.7	11.7	4.1	15.4	10.8
2000	10.7	14.0	4.9	8.4	6.3	21.0	13.6
2001	12.0	7.4	2.2	5.1	4.3	20.9	12.9
2002	22.9	13.6	5.2	8.6	17.6	17.0	9.7
2003	18.8	24.4	19.4	17.1	13.2	28.3	13.2
2004	43.3	23.7	19.8	18.0	19.7	31.7	18.9
2005	31.5	15.6	5.4	9.6	23.6	35.6	15.3
2006	21.2	16.4	7.2	11.8	16.9	31.0	12.2
2007	17.5	18.2	7.1	12.3	4.5	35.8	16.3
2008	17.1	20.9	13.8	12.9	3.7	36.8	24.3
2009	9.6	15.6	11.5	8.3	1.7	35.8	22.4
2010	6.5	14.7	7.0	9.4	1.2	31.5	17.4
2011	37.5	9.3	3.9	6.1	33.0	29.3	15.1
2012	8.0	9.7	4.9	6.7	7.6	19.6	13.2
2013	6.7	12.9	5.3	9.4	1.3	15.6	11.1
2014	15.5	19.7	7.3	12.4	2.8	36.9	17.0
2015	6.7	11.6	4.0	8.7	2.4	18.4	10.6
2016	4.7	9.0	2.6	7.1	3.6	22.4	11.6

Table 8. -- Average bottom water temperatures collected at stations with mature female Bristol Bay red king crab (*Paralithodes camtschaticus*) on the National Marine Fisheries Service eastern Bering Sea bottom trawl survey and the ratio of eyed to uneyed embryos in mature red king crab females with the warm years highlighted in gray. Bristol Bay stations were sampled twice during the cold years. An * indicates statistical significance within the year using a two sample t-test, alpha = 0.95 and $P < 0.001$.

Sample event	Average bottom temperature (°C)	Standard deviation (n = stations)	Two sample t-test values	Eyed to uneyed embryo ratio
May 1999	0.1	0.8 (41)	t = -11.9	6.54
July 1999	2.5*	0.8 (31)		0.02
May 2000	1.7	0.5 (49)	t = -9.2	1.45
July 2000	4.6*	1.6 (23)		0.01
June 2001	3.5	0.3 (40)		0.01
June 2002	3.4	0.6 (52)		0.06
June 2003	4.2	0.4 (51)		0.01
June 2004	3.9	0.5 (61)		0.03
June 2005	4.3	0.5 (49)		0.01
June 2006	2.2	0.7 (69)	t = -12.5	0.59
July 2006	4.2*	0.8 (30)		0.01
June 2007	1.8	0.9 (68)	t = -7.4	0.86
July 2007	3.4*	1.0 (32)		0.01
June 2008	1.4	0.7 (76)	t = -9.5	0.45
July 2008	3.6*	1.1 (32)		0.00
June 2009	1.5	1.6 (73)	t = -8.6	0.42
July 2009	4.5*	1.5 (32)		0.00
June 2010	2	0.9 (40)	t = -10.9	0.64
July 2010	4.8*	1.0 (23)		0.03
June 2011	2.9	0.8 (46)	t = -8.6	0.80
July 2011	5.9*	1.1 (20)		0.06
June 2012	0.9	1.2 (40)	t = -8.4	0.91
July 2012	4.0*	1.3 (15)		0.00
June 2013	2.9	1.1 (35)		0.02
June 2014	4.4	0.8 (40)		0.00
June 2015	4.6	0.4 (44)		0.00
June 2016	5.7	0.7 (57)		0.00

Table 9. -- Time series of biomass estimates (t) for Pribilof District red king crab (*Paralithodes camtschaticus*) by size category (CL) and sex from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1977 data.

Year	Immature male < 120 mm	Mature male ≥ 120 mm	Mature male ± CI	Legal male ≥ 135 mm	Immature female	Mature female	Mature female ± CI
1978	0	1,250	2,022	1,250	0	52	102
1979	0	556	561	488	0	93	182
1980	18	1,269	950	1,269	0	262	374
1981	0	312	358	312	0	35	68
1982	18	1,464	2,002	1,464	14	919	1,402
1983	26	527	551	493	0	309	292
1984	0	317	341	283	0	112	125
1985	0	61	121	61	0	0	0
1986	0	138	188	138	0	79	154
1987	0	54	105	54	31	0	0
1988	713	107	209	44	283	553	940
1989	675	1,529	2,728	871	924	1,327	2,140
1990	7,477	1,141	2,077	138	522	2,200	3,048
1991	640	4,430	6,913	1,321	66	4,967	5,864
1992	274	3,305	3,864	2,528	278	3,153	5,620
1993	282	9,873	17,834	9,189	7	6,471	9,096
1994	430	9,139	13,748	8,117	47	3,917	6,772
1995	431	18,056	21,267	16,793	315	4,834	6,393
1996	68	2,361	1,720	2,330	31	1,976	2,867
1997	1,510	6,159	7,515	5,940	218	1,744	2,018
1998	416	2,324	1,639	1,778	50	1,669	2,487
1999	3,358	5,523	7,217	4,472	4,117	1,302	1,826
2000	157	4,320	3,164	3,843	8	987	1,214
2001	2,339	8,603	13,262	5,770	406	5,369	10,462
2002	8	7,037	9,461	7,014	12	775	803
2003	0	5,373	6,928	5,275	1	2,268	4,032
2004	152	3,622	4,183	3,622	105	1,187	1,238
2005	55	1,238	1,420	1,238	0	3,118	4,791
2006	109	7,003	5,252	6,696	10	2,173	2,627
2007	214	5,224	5,042	5,007	50	1,760	2,647
2008	332	5,462	5,418	5,102	192	2,825	3,701
2009	44	2,500	3,125	2,127	15	811	841
2010	53	4,405	3,767	3,973	0	840	1,167
2011	44	3,834	4,872	3,751	3	814	1,165
2012	336	4,477	5,031	4,360	0	663	710
2013	104	7,749	9,409	7,567	0	169	194
2014	82	12,047	18,525	11,433	0	1,093	2,015
2015	113	15,173	21,971	14,788	0	3,859	7,270
2016	526	4,150	5,700	3,653	26	1,873	2,241

Table 10. -- Time series of abundance estimates (in millions) for Pribilof District red king crab (*Paralithodes camtschaticus*) by size category (CL) and sex from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1978 data.

Year	Immature male < 120 mm	Mature male ≥ 120 mm	Mature male ± CI	Legal male ≥ 135 mm	Immature female	Mature female	Mature female ± CI
1979	0.0	0.2	0.2	0.2	0.0	0.1	0.1
1980	0.1	0.4	0.3	0.4	0.0	0.1	0.2
1981	0.0	0.1	0.1	0.1	0.0	0.0	0.0
1982	0.0	0.3	0.4	0.3	0.0	0.5	0.7
1983	0.0	0.1	0.1	0.1	0.0	0.2	0.1
1984	0.0	0.1	0.1	0.1	0.0	0.1	0.1
1985	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1986	0.0	0.0	0.1	0.0	0.0	0.0	0.1
1987	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1988	1.9	0.1	0.1	0.0	1.6	0.4	0.7
1989	1.1	0.8	1.4	0.4	1.8	1.1	1.7
1990	7.1	0.8	1.4	0.1	0.7	2.3	3.0
1991	0.7	2.4	3.8	0.6	0.3	4.3	5.1
1992	0.4	1.5	1.8	1.0	0.4	2.4	4.4
1993	0.3	3.5	6.4	3.1	0.0	4.5	6.4
1994	0.4	3.1	4.7	2.4	0.1	2.4	4.2
1995	0.5	5.2	5.9	4.4	0.3	3.0	3.9
1996	0.1	0.6	0.4	0.5	0.0	1.1	1.6
1997	1.6	1.6	1.7	1.4	0.3	1.0	1.1
1998	0.4	0.8	0.6	0.4	0.1	1.0	1.4
1999	7.2	1.9	2.2	1.3	9.5	0.9	1.1
2000	0.1	1.5	1.2	1.3	0.0	0.7	0.8
2001	2.5	3.7	6.1	1.9	0.6	3.8	7.5
2002	0.0	1.9	2.5	1.9	0.0	0.4	0.4
2003	0.0	1.5	2.0	1.4	0.0	1.2	2.1
2004	1.4	0.8	0.9	0.8	1.1	0.5	0.6
2005	0.1	0.2	0.3	0.2	0.0	1.3	2.0
2006	0.1	1.4	1.1	1.2	0.0	1.0	1.1
2007	0.2	1.2	1.3	1.1	0.1	0.8	1.3
2008	0.4	1.3	1.2	1.1	0.2	1.5	2.1
2009	0.0	0.9	1.2	0.7	0.0	0.3	0.3
2010	0.1	1.4	1.3	1.2	0.0	0.6	0.8
2011	0.0	1.0	1.3	1.0	0.0	0.5	0.6
2012	0.4	1.2	1.5	1.2	0.0	0.4	0.5
2013	0.1	1.7	2.0	1.6	0.0	0.1	0.1
2014	0.1	3.0	4.2	2.6	0.0	0.5	0.9
2015	0.1	3.5	4.9	3.3	0.0	1.8	3.3
2016	0.5	1.3	1.9	1.0	0.04	1.3	1.4

Table 11. -- Time series of biomass estimates (t) for blue king crab (*Paralithodes platypus*) by size category (CL) and sex in the Pribilof District from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1978 data.

Year	Immature male < 120 mm	Mature male ≥ 120 mm	Mature male ± CI	Legal male ≥ 135 mm	Immature female	Mature female	Mature female ± CI
1979	61	10,959	6,775	9,040	92	1,097	1,706
1980	2,084	23,553	19,846	20,679	699	211,604	408,004
1981	1,704	11,628	3,963	10,554	497	5,987	5,507
1982	1,152	7,389	2,712	6,893	553	8,824	11,724
1983	962	5,409	1,882	4,474	258	9,990	15,495
1984	130	2,216	993	1,824	15	3,070	2,292
1985	39	1,055	551	755	5	520	457
1986	4	1,505	893	1,473	11	2,420	4,272
1987	191	2,923	2,357	2,781	119	795	909
1988	170	842	873	842	190	528	508
1989	1,275	827	1,034	827	801	945	1,075
1990	2,004	3,078	3,617	1,514	1,118	1,810	1,803
1991	1,377	4,690	3,544	3,326	343	2,433	1,973
1992	1,801	4,391	3,637	3,035	802	1,848	1,737
1993	1,088	4,556	2,743	3,203	444	1,647	1,489
1994	619	3,410	2,305	2,806	87	4,806	4,207
1995	968	8,360	9,898	6,787	331	3,948	4,017
1996	745	4,641	2,444	3,873	177	5,408	5,318
1997	381	3,233	1,749	2,765	194	2,835	2,386
1998	692	2,798	1,367	2,510	267	1,914	1,654
1999	161	1,729	1,141	1,426	0	2,868	2,625
2000	113	2,091	1,212	1,746	0	1,462	1,319
2001	87	1,599	2,302	1,461	0	1,816	2,571
2002	0	680	674	647	0	1,401	2,129
2003	19	702	550	671	21	1,286	1,880
2004	36	107	122	48	25	98	114
2005	326	344	479	344	477	370	413
2006	87	166	196	139	38	538	801
2007	197	306	479	206	59	223	384
2008	212	46	90	46	222	450	560
2009	254	497	695	187	80	545	907
2010	92	303	274	190	84	310	401
2011	0	461	763	399	3	34	49
2012	165	644	928	459	9	229	296
2013	15	250	391	190	12	154	211
2014	83	233	320	233	16	91	108
2015	82	622	480	428	0	160	207
2016	70	129	154	68	49	352	340

Table 12. -- Time series of abundance estimates (in millions) by size category (CL) and sex for blue king crab (*Paralithodes platypus*) in the Pribilof District from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1978 data.

Year	Immature male < 120 mm	Mature male ≥ 120 mm	Mature male ± CI	Legal male ≥ 135 mm	Immature female	Mature female	Mature female ± CI
1979	0.1	4.1	2.6	3.0	0.1	1.2	1.9
1980	2.7	7.8	6.3	6.2	0.8	182.9	350.4
1981	2.1	3.8	1.3	3.2	0.8	5.4	4.7
1982	1.4	2.4	0.8	2.1	0.9	7.8	10.0
1983	1.0	1.9	0.7	1.3	0.5	9.3	14.2
1984	0.5	0.8	0.3	0.6	0.5	2.8	2.1
1985	0.1	0.4	0.2	0.3	0.3	0.5	0.4
1986	0.0	0.5	0.3	0.5	0.0	2.1	3.7
1987	0.6	0.9	0.7	0.8	0.4	0.7	0.8
1988	1.2	0.2	0.2	0.2	0.9	0.5	0.4
1989	3.5	0.2	0.3	0.2	2.6	1.1	1.5
1990	2.4	1.5	1.8	0.6	2.2	2.0	2.2
1991	1.9	2.0	1.4	1.2	0.8	2.8	2.3
1992	2.4	1.9	1.6	1.2	1.8	2.1	2.1
1993	1.5	1.9	1.1	1.1	0.9	1.8	1.6
1994	0.6	1.3	0.9	0.9	0.1	5.0	4.4
1995	1.1	3.1	3.6	2.2	0.7	4.0	4.1
1996	0.7	1.7	0.9	1.3	0.3	5.0	4.8
1997	0.5	1.2	0.7	0.9	0.3	2.6	2.2
1998	0.9	1.0	0.5	0.8	0.5	1.8	1.6
1999	0.2	0.6	0.4	0.5	0.0	2.8	2.6
2000	0.2	0.7	0.4	0.5	0.0	1.4	1.2
2001	0.1	0.5	0.7	0.4	0.0	1.7	2.5
2002	0.0	0.2	0.2	0.2	0.0	1.2	1.9
2003	0.0	0.2	0.2	0.2	0.1	1.1	1.7
2004	0.1	0.0	0.1	0.0	0.1	0.1	0.1
2005	2.0	0.1	0.1	0.1	2.3	0.3	0.3
2006	0.1	0.1	0.1	0.0	0.1	0.4	0.6
2007	0.2	0.1	0.2	0.1	0.1	0.2	0.3
2008	0.2	0.0	0.0	0.0	0.3	0.4	0.6
2009	0.3	0.2	0.4	0.1	0.2	0.5	0.8
2010	0.1	0.1	0.1	0.1	0.2	0.2	0.3
2011	0.0	0.2	0.3	0.1	0.0	0.0	0.0
2012	0.2	0.3	0.4	0.2	0.0	0.3	0.5
2013	0.1	0.1	0.2	0.1	0.0	0.2	0.2
2014	0.1	0.1	0.1	0.1	0.0	0.1	0.1
2015	0.1	0.2	0.2	0.1	0.0	0.2	0.3
2016	0.1	0.1	0.1	0.02	0.1	0.4	0.4

Table 13. -- Time series of biomass estimates (t) for blue king crab (*Paralithodes platypus*) by size category (CL) and sex in the St. Matthew Island Section sampling stratum of the Northern District from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1978-1979 data.

Year	Immature male < 105 mm	Mature male ≥ 105 mm	Mature male ± CI	Legal male ≥ 120 mm	Immature female	Mature female	Mature female ± CI
1980	2,646	7,826	7,151	4,786	423	737	1,248
1981	527	6,175	4,894	4,715	97	63	71
1982	1,758	14,934	9,259	12,065	416	0	0
1983	1,162	8,834	4,907	6,919	78	1,597	2,183
1984	539	3,737	1,358	3,145	42	216	285
1985	404	2,831	1,208	2,405	95	38	60
1986	252	1,267	971	725	99	13	25
1987	495	2,022	1,130	1,284	205	35	49
1988	702	2,830	1,346	1,880	612	123	147
1989	3,041	4,790	2,344	3,415	1,219	504	448
1990	1,122	5,931	3,073	4,707	336	13	25
1991	1,664	6,073	2,918	4,099	521	270	506
1992	1,250	6,279	2,513	4,608	280	216	250
1993	2,106	8,425	2,685	6,258	643	1,635	3,026
1994	916	5,812	2,008	4,246	99	128	131
1995	1,038	4,889	1,653	3,448	182	21	28
1996	1,291	8,494	4,013	6,218	364	432	770
1997	1,342	10,005	6,471	7,341	287	407	707
1998	902	7,478	5,269	5,487	210	243	261
1999	272	1,423	507	1,163	93	14	28
2000	315	1,880	1,136	1,534	52	37	52
2001	483	2,512	1,254	1,937	145	43	48
2002	119	1,640	1,033	1,371	1	89	120
2003	542	1,233	765	918	94	339	430
2004	443	1,341	754	1,139	194	66	82
2005	449	1,396	987	1,016	93	52	76
2006	1,050	3,223	2,262	2,460	145	14	28
2007	2,618	4,564	3,113	2,217	247	47	47
2008	1,972	3,655	2,059	2,701	214	40	45
2009	1,891	5,079	2,630	2,571	218	192	191
2010	3,974	8,141	5,955	4,317	112	456	856
2011	1,699	9,516	10,167	5,701	122	32	46
2012	907	5,652	3,668	3,313	52	74	64
2013	446	2,022	860	1,485	85	27	38
2014	796	5,472	4,750	3,568	40	62	75
2015	825	5,134	7,656	3,592	5	24	35
2016	509	3,072	2,273	2,305	0	129	104

Table 14. -- Time series of abundance estimates (in millions) for blue king crab (*Paralithodes platypus*) by size category (CL) and sex in the St. Matthew Island Section sampling stratum of the Northern District from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1978-1979 data.

Year	Immature male < 105 mm	Mature male ≥ 105 mm	Mature male ± CI	Legal male ≥ 120 mm	Immature female	Mature female	Mature female ± CI
1980	4.2	5.1	5.1	2.5	1.1	1.3	2.2
1981	0.9	3.5	2.5	2.3	0.2	0.1	0.1
1982	3.0	8.3	5.5	5.9	0.9	0.0	0.0
1983	2.0	5.0	2.9	3.3	0.4	2.6	3.5
1984	1.3	1.9	0.7	1.5	0.2	0.3	0.4
1985	0.7	1.5	0.7	1.1	0.3	0.1	0.1
1986	0.6	0.8	0.7	0.4	0.3	0.0	0.0
1987	1.0	1.3	0.8	0.7	0.6	0.1	0.1
1988	1.5	1.8	0.9	1.0	1.6	0.2	0.2
1989	6.2	2.9	1.5	1.8	3.2	1.0	0.8
1990	1.9	3.4	1.8	2.3	0.8	0.0	0.0
1991	3.3	3.9	1.9	2.2	1.4	0.4	0.8
1992	2.2	3.7	1.5	2.3	0.8	0.5	0.5
1993	4.2	5.1	1.7	3.3	1.7	2.3	4.3
1994	1.4	3.6	1.3	2.3	0.2	0.2	0.2
1995	1.7	2.9	1.0	1.7	0.6	0.0	0.1
1996	2.4	5.0	2.5	3.1	1.1	0.7	1.2
1997	2.3	6.0	4.2	3.8	0.8	0.6	1.1
1998	2.1	4.5	3.4	2.8	0.6	0.4	0.4
1999	0.5	0.8	0.3	0.6	0.3	0.0	0.0
2000	0.5	1.0	0.6	0.7	0.1	0.1	0.1
2001	0.8	1.4	0.7	0.9	0.4	0.1	0.1
2002	0.2	0.9	0.5	0.6	0.0	0.1	0.2
2003	1.2	0.7	0.5	0.5	0.3	0.6	0.7
2004	0.9	0.7	0.5	0.6	0.5	0.1	0.1
2005	0.9	0.8	0.6	0.5	0.3	0.1	0.1
2006	1.8	1.9	1.4	1.2	0.3	0.0	0.0
2007	4.5	3.2	2.3	1.2	0.8	0.1	0.1
2008	3.8	2.3	1.3	1.5	0.7	0.1	0.1
2009	3.4	3.6	2.0	1.4	0.6	0.4	0.4
2010	6.2	5.7	4.6	2.5	0.4	1.0	1.9
2011	2.6	6.5	7.2	3.2	0.4	0.1	0.1
2012	1.6	3.8	2.6	1.8	0.2	0.1	0.1
2013	0.8	1.3	0.5	0.8	0.3	0.1	0.1
2014	1.3	3.4	3.4	1.8	0.1	0.1	0.1
2015	1.2	3.2	4.8	2.0	0.0	0.1	0.1
2016	0.8	1.8	1.5	1.2	0.0	0.3	0.2

Table 15. -- Time series of biomass estimates (t) for Tanner crab (*Chionoecetes bairdi*) by size category (CW) and sex from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys, east of 166° W. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1978 data.

Year	Immature male < 113 mm	Mature male ≥ 113 mm	Mature male ± CI	Legal male ≥ 120 mm	Immature female	Mature female	Mature female ± CI
1979	2,278	15,700	5,632	14,652	591	2,858	2,042
1980	8,433	40,546	25,266	37,082	1,321	11,562	8,541
1981	4,668	18,722	8,004	16,324	893	7,684	4,249
1982	5,518	11,084	3,934	9,415	1,310	6,797	3,505
1983	3,289	10,047	4,708	8,572	913	4,438	2,368
1984	2,522	9,498	4,010	8,376	671	4,129	3,590
1985	1,735	6,495	3,007	5,971	324	2,836	2,350
1986	4,583	5,043	3,078	4,005	1,499	2,006	1,000
1987	17,778	11,085	4,604	9,840	11,912	3,097	1,426
1988	26,460	31,670	29,201	22,482	3,703	19,182	11,150
1989	27,575	60,142	20,624	49,413	6,666	12,309	4,797
1990	23,938	52,942	18,111	47,567	5,990	19,032	8,996
1991	25,932	63,893	40,349	54,968	3,633	27,708	17,830
1992	15,381	74,538	47,450	66,517	346	11,013	4,847
1993	8,056	45,337	17,552	40,826	153	5,171	2,167
1994	3,217	29,086	9,786	26,534	65	5,268	3,096
1995	1,985	17,687	8,332	16,321	250	5,732	3,442
1996	3,435	16,545	10,642	15,562	1,015	5,533	3,885
1997	3,301	5,787	2,014	5,026	967	1,947	857
1998	3,175	5,229	1,580	4,259	550	1,202	492
1999	8,470	6,365	3,007	4,498	1,089	2,272	1,486
2000	5,297	11,131	6,847	8,913	729	2,885	2,197
2001	5,780	10,451	4,498	9,036	2,617	1,314	618
2002	4,359	10,043	4,434	9,030	1,768	1,701	1,106
2003	6,281	10,883	4,939	9,175	705	2,090	940
2004	3,444	9,011	5,060	7,773	267	863	341
2005	5,325	12,118	5,182	10,289	1,673	2,820	2,022
2006	15,136	13,500	5,467	10,921	2,451	4,025	2,318
2007	12,137	15,802	8,749	11,884	696	5,916	4,373
2008	10,424	26,753	28,996	22,447	622	4,457	2,665
2009	3,849	10,937	5,728	8,947	533	4,021	3,045
2010	3,674	10,752	5,420	9,137	795	2,115	1,752
2011	11,865	11,525	6,302	9,814	4,390	2,225	1,174
2012	30,882	14,485	6,790	10,602	5,694	8,550	5,264
2013	25,423	39,157	25,944	23,823	2,344	11,054	7,122
2014	18,262	39,934	12,430	30,404	489	8,159	7,538
2015	7,853	27,241	6,936	22,853	628	4,675	3,126
2016	6,997	18,523	4,755	14,143	50	1,429	850

Table 16. -- Time series of abundance estimates (in millions) for Tanner crab (*Chionoecetes bairdi*) by size category (CW) and sex from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys, east of 166° W. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1978 data.

Year	Immature male < 113 mm	Mature male ≥ 113 mm	Mature male ± CI	Legal male ≥ 120 mm	Immature female	Mature female	Mature female ± CI
1979	12.7	20.1	7.0	17.8	7.7	13.0	9.5
1980	40.5	50.4	30.6	43.0	15.6	50.5	37.7
1981	29.2	26.2	11.3	21.0	16.1	35.1	20.4
1982	28.2	16.3	6.0	12.7	14.7	31.2	16.6
1983	38.6	15.2	7.1	12.1	30.2	18.3	10.0
1984	27.4	13.0	5.3	10.6	19.5	16.3	13.1
1985	12.0	8.5	3.7	7.4	5.4	10.8	8.0
1986	50.6	7.3	3.8	5.1	37.5	8.7	3.9
1987	136.0	15.7	5.9	13.0	123.1	13.4	5.5
1988	138.2	49.3	41.4	29.6	56.3	84.4	47.9
1989	243.7	89.5	30.2	66.4	183.1	57.8	22.9
1990	167.4	68.1	22.0	56.7	98.7	101.5	47.2
1991	123.4	90.2	61.3	71.3	41.8	145.9	103.7
1992	54.7	105.7	67.0	88.5	5.1	53.9	23.2
1993	30.0	63.8	25.1	54.2	2.9	24.9	10.8
1994	12.8	39.4	13.4	34.0	2.7	27.0	17.2
1995	10.6	24.0	11.0	21.2	5.6	30.2	18.5
1996	29.3	21.8	13.8	19.8	18.1	28.9	20.4
1997	36.5	7.9	2.6	6.3	34.7	11.1	5.2
1998	24.9	7.8	2.4	5.8	13.4	6.7	2.9
1999	50.1	10.1	4.8	6.1	21.3	12.6	7.8
2000	32.7	16.8	10.0	12.1	16.6	15.0	11.2
2001	118.0	14.5	5.6	11.5	112.2	7.1	3.3
2002	45.8	13.2	5.3	11.0	36.4	10.8	7.9
2003	41.8	14.9	5.8	11.2	13.6	12.0	5.7
2004	18.2	12.4	5.3	9.7	8.6	4.5	2.1
2005	41.9	17.5	6.4	13.5	39.3	16.1	12.1
2006	84.0	20.1	7.7	14.6	29.1	21.9	12.0
2007	52.2	24.7	13.0	16.2	11.5	30.5	21.1
2008	42.1	37.8	36.2	28.7	8.9	24.6	15.2
2009	32.8	16.1	8.1	11.8	23.9	22.1	16.9
2010	39.1	15.3	7.3	11.9	29.7	10.6	8.4
2011	135.2	16.0	7.5	12.4	88.8	12.2	6.2
2012	167.6	22.7	10.7	14.4	65.8	52.4	35.7
2013	110.0	69.6	49.7	37.0	33.2	60.8	42.5
2014	75.5	62.3	19.0	41.9	15.1	44.7	42.0
2015	40.2	40.0	9.4	30.7	14.5	27.6	19.2
2016	24.6	29.6	7.7	20.2	1.4	7.7	4.7

Table 17. -- Time series of biomass estimates (t) for Tanner crab (*Chionoecetes bairdi*) by size category (CW) and sex from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys, west of 166° W. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1978 data.

Year	Immature male < 103 mm	Mature male ≥ 103 mm	Mature male ± CI	Legal male ≥ 110 mm	Immature female	Mature female	Mature female ± CI
1979	16,462	15,596	6,183	12,913	3,236	16,465	11,111
1980	64,467	39,038	17,099	27,984	12,199	52,221	33,389
1981	29,763	26,777	8,029	18,061	631	34,893	20,587
1982	14,735	34,520	12,749	25,512	410	57,347	32,263
1983	7,761	16,947	6,540	13,195	1,426	15,993	6,928
1984	5,865	12,625	4,735	10,016	1,573	10,785	5,490
1985	2,533	4,143	1,442	3,169	675	2,718	1,636
1986	6,228	5,758	4,123	3,286	1,210	1,360	831
1987	8,047	8,601	3,960	6,994	3,095	2,042	837
1988	19,282	21,812	12,530	17,868	6,484	6,184	3,169
1989	15,988	29,119	12,768	24,883	5,165	7,090	3,186
1990	16,029	39,509	22,820	35,175	3,869	18,663	17,538
1991	17,926	38,059	13,836	34,230	3,390	17,056	7,234
1992	11,419	26,255	11,787	23,410	1,644	15,213	6,889
1993	7,226	12,651	4,912	10,873	913	6,470	2,484
1994	5,070	10,962	3,745	9,526	1,137	4,579	2,492
1995	3,553	11,757	6,911	10,592	808	6,667	4,052
1996	2,927	7,863	6,170	6,682	424	4,047	3,539
1997	1,986	3,575	1,185	2,873	442	1,451	884
1998	3,041	3,563	1,227	2,602	1,413	1,076	505
1999	4,409	2,311	961	1,679	1,793	1,554	635
2000	4,116	2,787	850	2,003	1,753	1,246	622
2001	8,171	4,918	2,069	3,943	3,741	3,247	1,915
2002	8,691	4,318	1,595	3,029	3,733	2,766	1,375
2003	12,528	8,133	3,789	6,424	3,984	6,313	3,007
2004	13,064	13,404	7,012	9,732	3,866	3,865	1,569
2005	18,964	27,348	10,511	23,655	8,710	8,759	3,745
2006	33,861	39,045	19,584	32,859	10,808	10,914	4,484
2007	35,745	40,540	25,656	31,673	4,944	7,521	2,312
2008	15,705	32,031	17,342	26,351	2,238	7,206	3,191
2009	9,673	22,980	9,143	19,770	2,039	4,456	1,569
2010	8,305	26,296	14,128	23,372	3,008	3,358	1,567
2011	13,198	26,123	17,353	23,259	6,001	3,189	983
2012	19,737	15,027	4,271	11,928	5,982	3,805	1,338
2013	18,417	20,423	9,311	15,939	4,071	6,795	2,393
2014	17,345	33,394	8,146	24,859	2,023	6,705	3,547
2015	8,036	31,122	9,281	27,067	1,038	6,536	4,526
2016	8,196	35,119	8,671	31,252	1,057	6,076	3,664

Table 18. -- Time series of abundance estimates (in millions) for Tanner crab (*Chionoecetes bairdi*) by size category (CW) and sex from National Marine Fisheries Service eastern Bering Sea bottom trawl surveys, west of 166° W. The 95% confidence intervals (CI) are 1.96 SE. See authors for 1975-1978 data.

Year	Immature male < 103 mm	Mature male ≥ 103 mm	Mature male ± CI	Legal male ≥ 110 mm	Immature female	Mature female	Mature female ± CI
1979	135.8	28.2	10.9	20.7	49.0	118.3	80.6
1980	476.3	80.0	33.1	49.0	159.2	380.4	259.6
1981	156.1	56.8	16.8	32.3	10.3	268.7	170.6
1982	74.3	71.3	26.1	46.0	15.5	433.1	265.7
1983	108.0	34.6	13.5	24.1	96.5	109.9	48.3
1984	67.2	25.8	9.6	18.5	59.0	70.1	36.8
1985	28.6	8.4	2.9	5.7	21.0	18.6	12.3
1986	49.3	13.5	10.5	6.5	24.1	8.3	4.6
1987	91.0	16.2	6.6	11.6	74.9	12.9	5.3
1988	198.0	39.9	21.1	28.8	129.9	38.1	18.6
1989	156.4	50.2	19.6	38.3	101.9	43.3	19.2
1990	130.0	65.5	35.9	53.4	75.1	107.5	91.6
1991	162.7	65.2	22.5	54.4	84.1	109.2	48.3
1992	101.9	43.2	15.5	35.1	48.6	97.0	43.1
1993	58.1	23.4	8.4	18.4	26.4	42.6	16.4
1994	46.8	20.0	6.4	15.9	34.3	29.2	15.6
1995	32.4	21.3	12.3	18.1	20.6	43.1	25.9
1996	24.3	15.0	11.1	11.7	15.0	26.2	22.3
1997	24.6	7.3	2.3	5.3	22.6	9.0	5.4
1998	49.1	7.4	2.5	4.7	44.7	6.6	3.1
1999	83.4	5.0	2.2	3.2	79.7	10.1	4.0
2000	71.5	6.0	1.8	3.8	57.0	7.3	3.6
2001	145.2	9.8	3.7	7.0	127.2	21.0	11.5
2002	128.8	9.1	3.2	5.5	111.6	19.1	10.9
2003	171.5	16.4	7.2	11.6	123.8	48.5	26.2
2004	207.5	29.2	15.9	18.9	169.9	27.7	13.5
2005	241.1	49.5	17.8	39.2	215.7	60.7	27.9
2006	287.0	72.3	30.4	54.8	178.1	76.4	31.2
2007	279.4	80.2	45.3	55.1	114.3	51.5	16.3
2008	110.8	62.2	29.9	46.2	53.4	48.6	21.8
2009	98.3	42.7	16.6	33.7	71.4	29.2	10.0
2010	114.2	45.7	21.5	37.5	91.6	21.9	10.1
2011	186.6	42.9	22.9	34.8	157.6	20.3	6.0
2012	223.8	28.7	8.1	20.0	122.0	25.6	8.9
2013	183.9	39.7	17.1	27.0	97.2	48.0	17.0
2014	140.4	68.0	17.8	43.8	90.4	43.6	23.7
2015	67.7	57.4	16.5	46.0	36.3	45.4	33.7
2016	75.2	62.2	15.5	51.3	42.1	42.6	27.3

Table 19. -- Time series of biomass estimates (t) for eastern Bering Sea snow crab (*Chionoecetes opilio*) by size category (CW) and sex from National Marine Fisheries Service bottom trawl surveys, all Districts combined. The 95% confidence intervals (CI) are 1.96 SE.

Year	Immature male < 95 mm	Mature male ≥ 95 mm	Mature male ± CI	Legal male ≥ 78 mm	Immature female	Mature female*	Mature female ± CI*
1980	236,814	99,240	30,937	180,837	27,575	271,682	174,119
1981	166,540	38,042	8,061	97,286	10,988	118,845	40,403
1982	250,475	65,864	19,430	177,794	3,654	141,492	43,943
1983	184,837	68,047	18,468	163,096	3,622	82,182	32,620
1984	119,438	119,971	32,543	183,321	14,119	39,369	15,417
1985	44,214	55,691	12,225	79,334	5,364	5,889	2,487
1986	83,408	58,725	14,454	84,159	26,043	15,174	6,209
1987	266,342	107,536	23,901	178,662	107,989	119,551	44,272
1988	331,332	144,135	53,992	246,515	36,803	165,619	57,314
1989	372,788	143,216	29,275	291,753	23,265	256,728	163,114
1990	306,733	347,750	102,169	521,713	38,213	174,942	72,149
1991	293,255	347,976	105,727	477,618	68,925	199,020	94,676
1992	179,621	166,483	35,962	223,585	49,374	123,479	48,802
1993	273,570	98,857	22,246	143,013	74,921	127,081	41,412
1994	289,633	57,386	12,134	109,683	68,240	122,604	33,649
1995	368,026	61,758	20,003	158,155	31,019	164,959	44,039
1996	341,043	143,856	52,118	312,771	9,274	104,429	31,008
1997	209,131	232,388	57,042	362,928	5,452	101,393	39,142
1998	100,536	164,119	32,216	219,422	13,324	70,183	38,534
1999	44,127	67,352	13,850	87,096	6,160	29,849	13,945
2000	77,782	53,942	16,022	76,830	12,480	93,882	99,120
2001	167,671	56,449	11,370	106,070	17,033	74,840	43,557
2002	83,002	55,907	26,886	100,734	4,388	29,508	18,448
2003	81,606	44,423	10,558	72,396	14,838	38,761	30,847
2004	89,330	44,162	14,554	61,726	30,472	47,743	26,154
2005	184,025	50,072	10,120	105,971	55,125	62,603	27,395
2006	124,579	90,152	61,487	141,960	28,090	50,592	20,186
2007	140,003	99,875	36,249	162,108	27,875	54,449	34,546
2008	114,297	79,600	16,993	123,530	8,994	49,352	22,756
2009	98,468	103,188	30,883	149,588	29,660	50,002	22,623
2010	146,025	105,278	27,471	134,170	90,479	94,956	34,177
2011	149,214	111,662	25,824	145,916	41,232	169,117	63,699
2012	123,683	67,476	18,910	104,438	41,425	143,268	65,922
2013	100,506	58,389	14,779	99,733	31,364	125,672	50,923
2014	140,092	105,441	41,571	151,453	54,523	111,362	46,704
2015	85,434	46,410	14,071	71,550	35,701	81,628	29,256
2016	103,747	29,961	6,869	51,670	53,788	52,022	21,010

* Differences from previous six reports due to reanalysis of length-weight regression data.

Table 20. -- Time series of abundance estimates (in millions) for eastern Bering Sea snow crab (*Chionoecetes opilio*) by size category (CW) and sex from National Marine Fisheries Service bottom trawl surveys, all Districts combined. The 95% confidence intervals (CI) are 1.96 SE.

Year	Immature male < 95 mm	Mature male ≥ 95 mm	Mature male ± CI	Legal male ≥ 78 mm	Immature female	Mature female	Mature female ± CI
1980	2,567.0	194.8	65.0	513.4	898.5	4,830.3	3,219.6
1981	1,575.4	79.8	17.7	318.8	233.3	2,047.8	713.9
1982	1,779.0	145.3	44.0	591.1	79.9	2,317.2	770.8
1983	1,486.0	150.3	41.2	511.7	240.5	1,466.0	611.0
1984	1,223.6	237.6	62.8	476.1	551.9	670.0	273.8
1985	444.6	105.9	23.3	195.9	213.0	103.4	44.7
1986	1,143.1	110.6	27.0	211.2	842.1	267.4	110.5
1987	3,758.6	215.7	48.8	493.3	2,955.5	2,040.2	768.0
1988	3,677.9	276.9	94.8	683.8	1,045.8	2,795.6	975.4
1989	3,111.0	292.3	60.6	882.5	564.7	4,625.9	3,417.8
1990	2,263.9	710.4	214.0	1,348.1	1,043.9	3,008.7	1,392.7
1991	3,331.8	618.3	179.4	1,093.8	2,270.7	3,545.4	1,930.8
1992	2,776.2	293.2	62.7	512.9	1,862.2	2,068.9	849.0
1993	4,805.5	182.8	41.9	355.8	2,909.2	2,396.3	818.2
1994	4,116.9	106.4	22.2	320.6	2,684.2	2,204.8	552.4
1995	3,635.3	128.0	43.9	515.7	1,021.7	3,109.1	825.9
1996	2,309.8	302.4	105.2	958.6	258.4	2,107.2	680.4
1997	1,204.4	447.1	100.4	945.8	142.9	2,001.0	813.2
1998	778.2	308.4	59.3	514.6	336.0	1,386.7	791.2
1999	422.4	124.9	23.9	198.8	187.6	551.0	270.0
2000	971.1	102.4	31.8	191.1	391.9	1,649.1	1,711.0
2001	1,529.4	111.3	24.1	312.7	470.9	1,243.8	727.5
2002	596.3	114.7	54.8	284.5	121.1	502.8	342.5
2003	1,073.7	88.1	21.3	196.0	542.4	680.2	601.4
2004	1,491.2	79.9	24.2	147.8	1,375.9	931.9	525.2
2005	1,890.3	89.2	17.6	312.5	1,512.2	1,110.9	498.3
2006	1,178.4	171.9	119.4	377.6	765.7	744.3	304.8
2007	1,260.8	196.7	67.0	435.0	620.4	839.6	623.2
2008	1,008.8	154.3	31.6	325.2	395.9	747.7	445.2
2009	1,055.4	195.7	57.9	371.5	1,059.9	747.2	356.6
2010	2,460.5	184.4	45.1	293.7	3,027.6	1,777.8	654.1
2011	1,829.8	194.1	45.7	330.8	1,175.4	3,137.0	1,190.0
2012	1,384.9	123.5	34.3	274.1	1,165.5	2,656.1	1,309.6
2013	1,055.9	112.6	27.6	280.0	1,029.4	2,222.2	994.7
2014	1,527.8	204.2	76.8	385.3	1,590.8	1,815.6	894.7
2015	1,504.2	84.2	22.3	183.8	1,461.0	1,238.6	497.4
2016	2,361.9	57.8	13.2	143.2	2,131.6	818.4	347.2

Table 21. -- Time series of biomass estimates (t) for hair crab (*Erimacrus isenbeckii*) by size category (CL) and sex from National Marine Fisheries Service bottom trawl surveys, all Districts combined. The 95% confidence intervals (CI) are 1.96 SE.

Year	Sublegal males < 83 mm	Legal males ≥ 83 mm	Legal males ± CI	Total female	Total female ± CI
1980	988	16,164	11,703	758	1,041
1981	183	10,091	3,658	182	114
1982	182	6,717	3,942	120	70
1983	67	4,231	1,331	296	152
1984	310	3,048	999	106	94
1985	83	2,084	1,041	73	57
1986	207	1,482	787	100	69
1987	355	1,083	607	208	110
1988	631	618	354	168	89
1989	2,955	404	240	43	40
1990	2,540	783	453	255	155
1991	1,393	795	434	230	130
1992	778	591	300	80	53
1993	1,111	2,296	1,588	217	148
1994	1,324	2,413	1,253	194	133
1995	1,396	4,326	2,791	158	84
1996	1,152	3,163	1,738	277	132
1997	584	3,103	1,289	92	56
1998	213	1,984	798	361	241
1999	196	1,735	510	308	125
2000	180	2,873	1,259	331	180
2001	132	1,287	521	565	243
2002	65	1,375	529	101	64
2003	357	659	275	83	49
2004	204	491	191	83	71
2005	328	212	132	273	134
2006	357	661	415	877	954
2007	575	1,278	519	357	168
2008	623	1,346	631	387	174
2009	1,104	1,916	731	464	250
2010	903	1,610	677	469	186
2011	1,752	2,129	935	377	162
2012	3,626	2,878	1,128	534	234
2013	3,357	6,469	2,626	1,055	433
2014	1,144	3,391	1,298	304	139
2015	616	1,338	511	127	74
2016	213	716	307	71	50

Table 22. -- Time series of abundance estimates (in millions) for hair crab (*Erimacrus isenbeckii*) by size category (CL) and sex from National Marine Fisheries Service bottom trawl surveys, all Districts combined. The 95% confidence intervals (CI) are 1.96 SE.

Year	Sublegal males < 83 mm	Legal males ≥ 83 mm	Legal males ± CI	Total female	Total female ± CI
1980	3.0	20.8	15.2	4.8	7.8
1981	0.5	12.2	4.5	0.5	0.3
1982	0.6	8.4	4.9	0.4	0.2
1983	0.3	5.3	1.7	0.9	0.5
1984	1.1	3.8	1.3	0.4	0.3
1985	0.3	2.5	1.3	0.3	0.2
1986	0.7	1.9	1.0	0.4	0.3
1987	1.6	1.4	0.7	0.9	0.4
1988	3.9	0.8	0.4	0.9	0.7
1989	12.6	0.5	0.3	0.1	0.1
1990	10.1	1.2	0.8	1.0	0.6
1991	4.8	1.3	0.7	1.2	0.7
1992	2.5	1.1	0.6	0.5	0.4
1993	3.8	3.9	2.6	1.3	1.0
1994	5.0	4.0	2.1	1.3	1.1
1995	5.0	6.6	4.3	0.7	0.3
1996	3.6	5.1	2.7	1.0	0.5
1997	1.7	4.6	1.8	0.4	0.2
1998	0.6	2.9	1.1	1.3	0.8
1999	0.6	2.4	0.7	1.2	0.4
2000	0.5	4.1	1.7	1.2	0.7
2001	0.5	1.8	0.7	2.2	1.0
2002	0.3	2.0	0.8	0.5	0.3
2003	1.3	0.9	0.4	0.5	0.3
2004	0.6	0.8	0.3	0.3	0.2
2005	1.0	0.3	0.2	0.8	0.5
2006	1.2	1.0	0.7	3.6	4.6
2007	2.3	1.9	0.7	1.3	0.9
2008	2.3	2.2	1.0	1.4	0.6
2009	3.6	3.1	1.1	1.7	0.9
2010	3.3	2.5	1.0	2.2	1.1
2011	6.9	3.5	1.4	1.6	0.6
2012	11.8	4.6	1.8	2.2	0.8
2013	10.3	10.7	4.6	4.0	1.7
2014	3.3	5.4	2.0	1.0	0.4
2015	1.8	2.1	0.8	0.6	0.3
2016	0.6	1.2	0.5	0.3	0.3

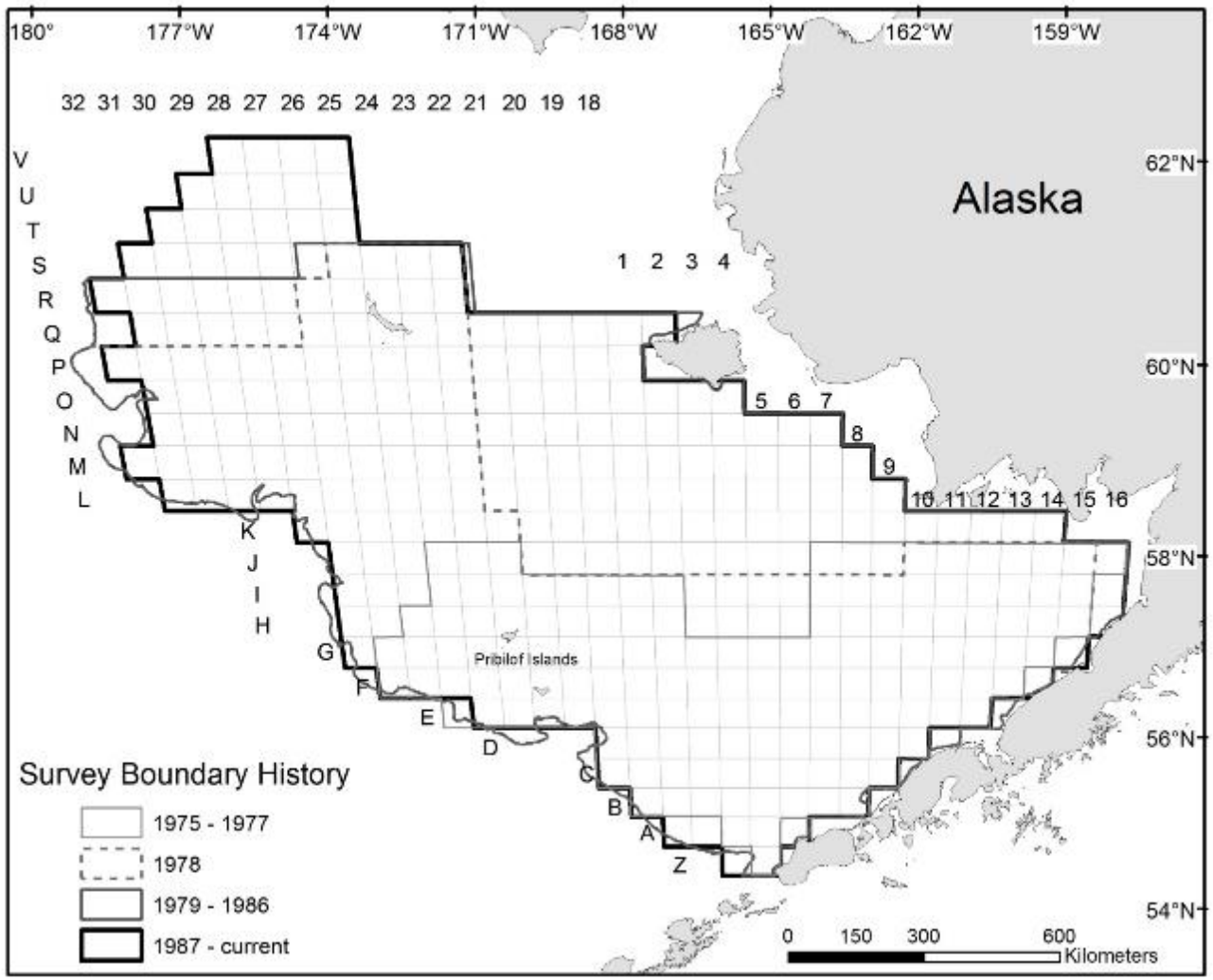

Figure 1. -- National Marine Fisheries Service eastern Bering Sea bottom trawl survey boundary from 1975 to present indicating four major stanzas in total coverage.

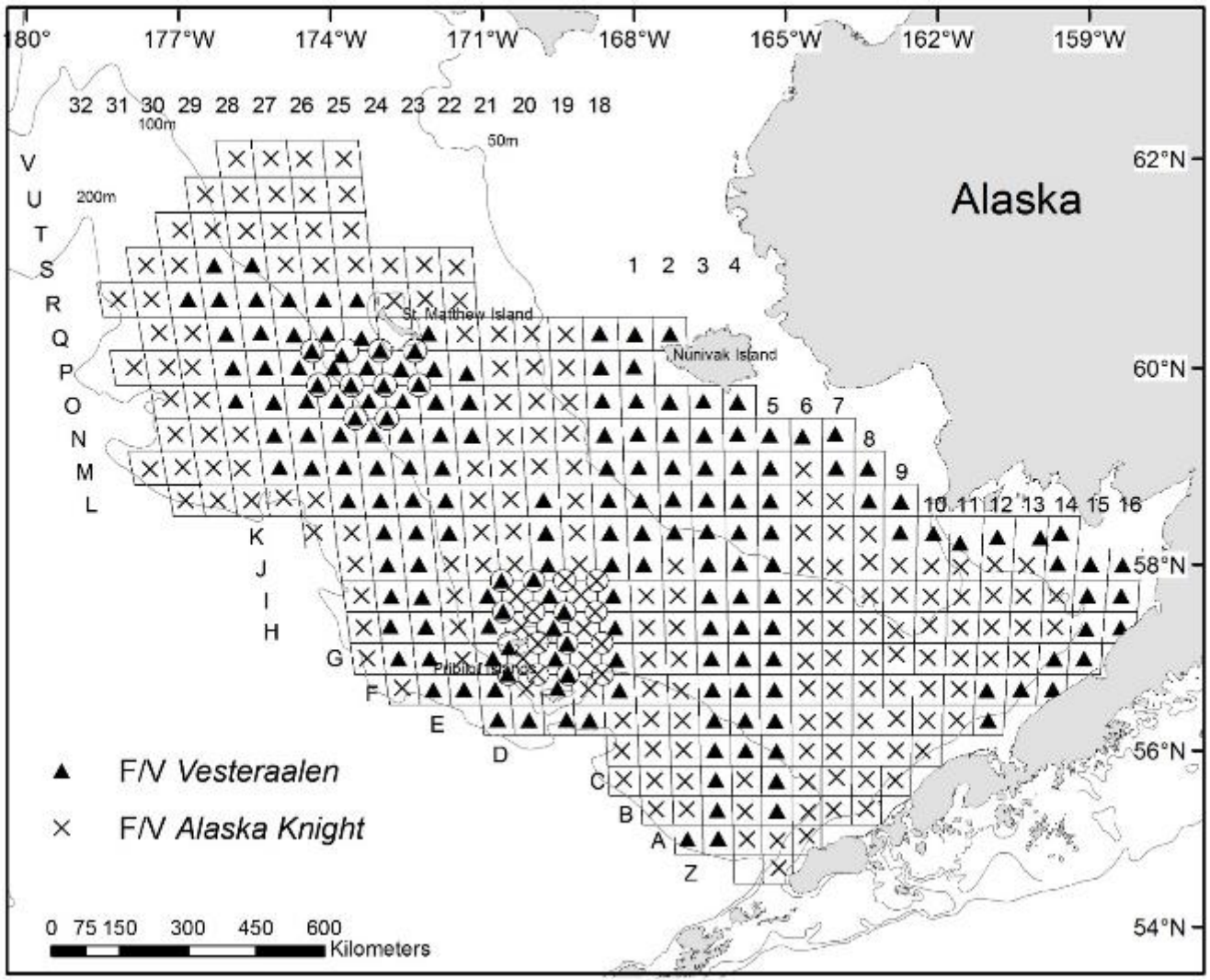

Figure 2. -- National Marine Fisheries Service eastern Bering Sea standard bottom trawl area surveyed by the FV *Alaska Knight* and the FV *Vesteraalen* from 31 May to 26 July 2016.

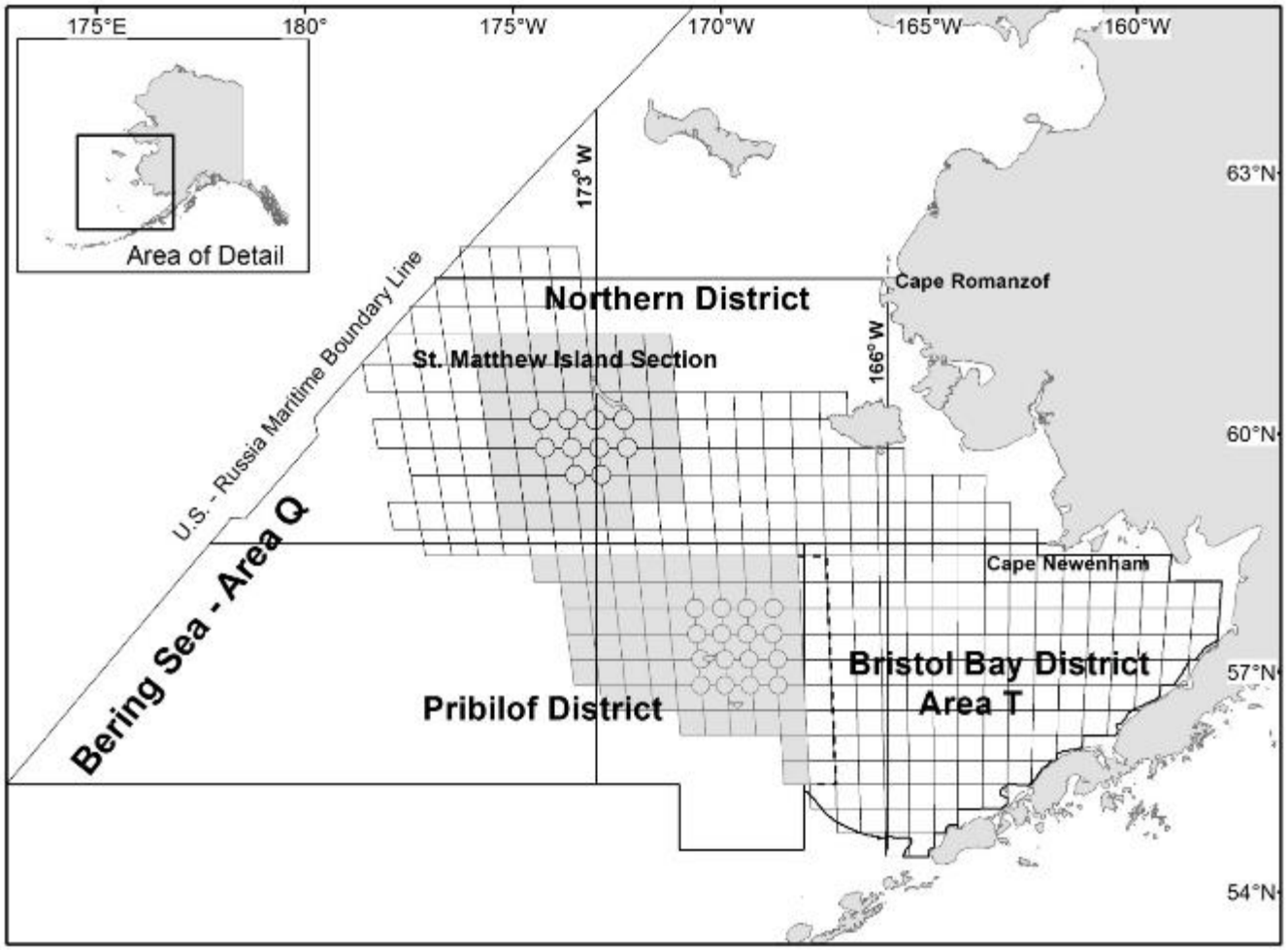

Figure 3. -- Alaska Department of Fish and Game commercial crab management units within the 2016 eastern Bering Sea bottom trawl survey area. Grey areas represent stations included in the Pribilof District (dashed line indicates expanded stock boundary for blue king crab) and St. Matthew Island Section, Northern District sampling strata and circles represent the high-density sampling areas.

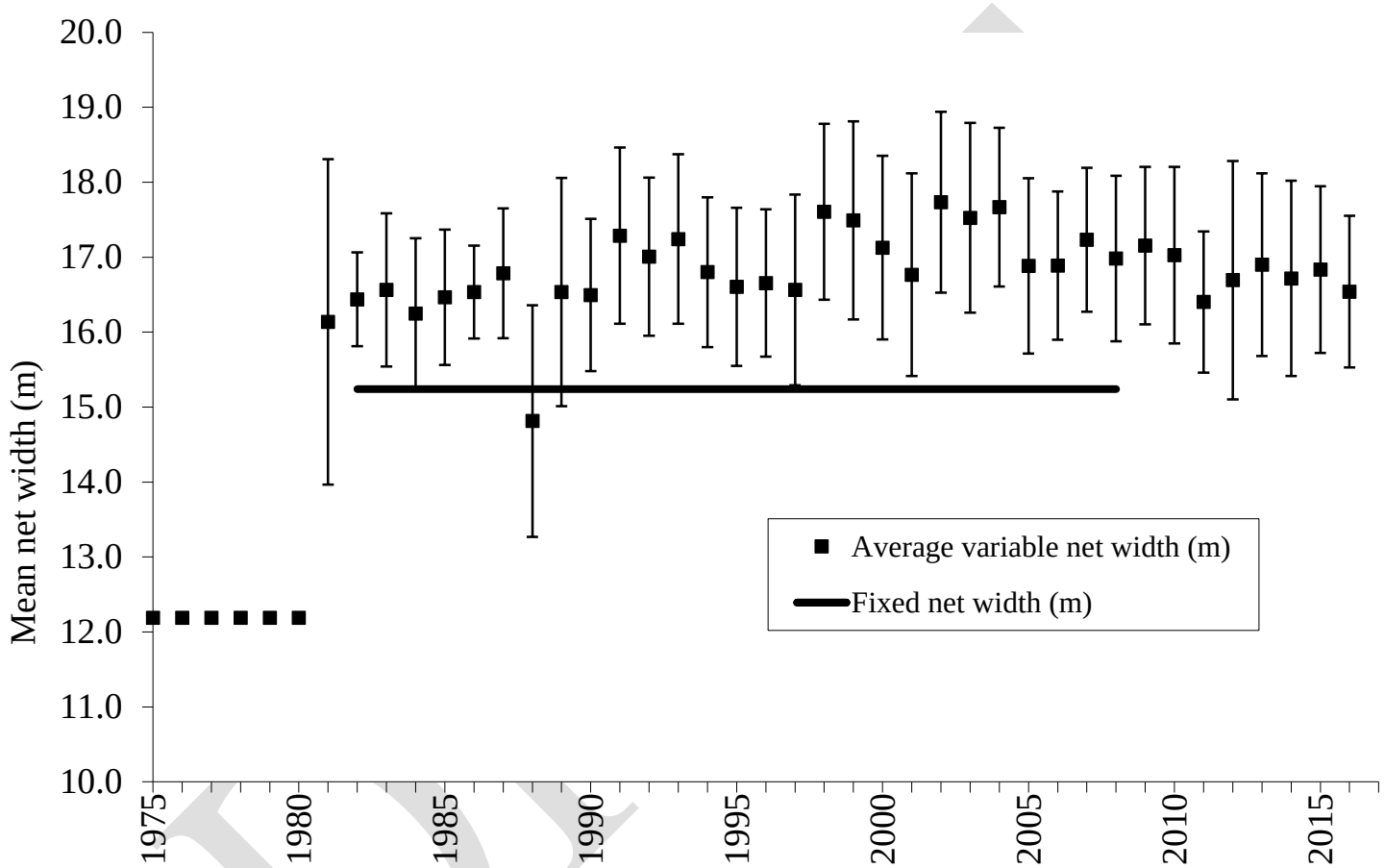

Figure 4. -- Fixed and average variable net widths (± SD) used to calculate area swept by National Marine Fisheries Service eastern Bering Sea standard bottom trawls from 1975 to the present.

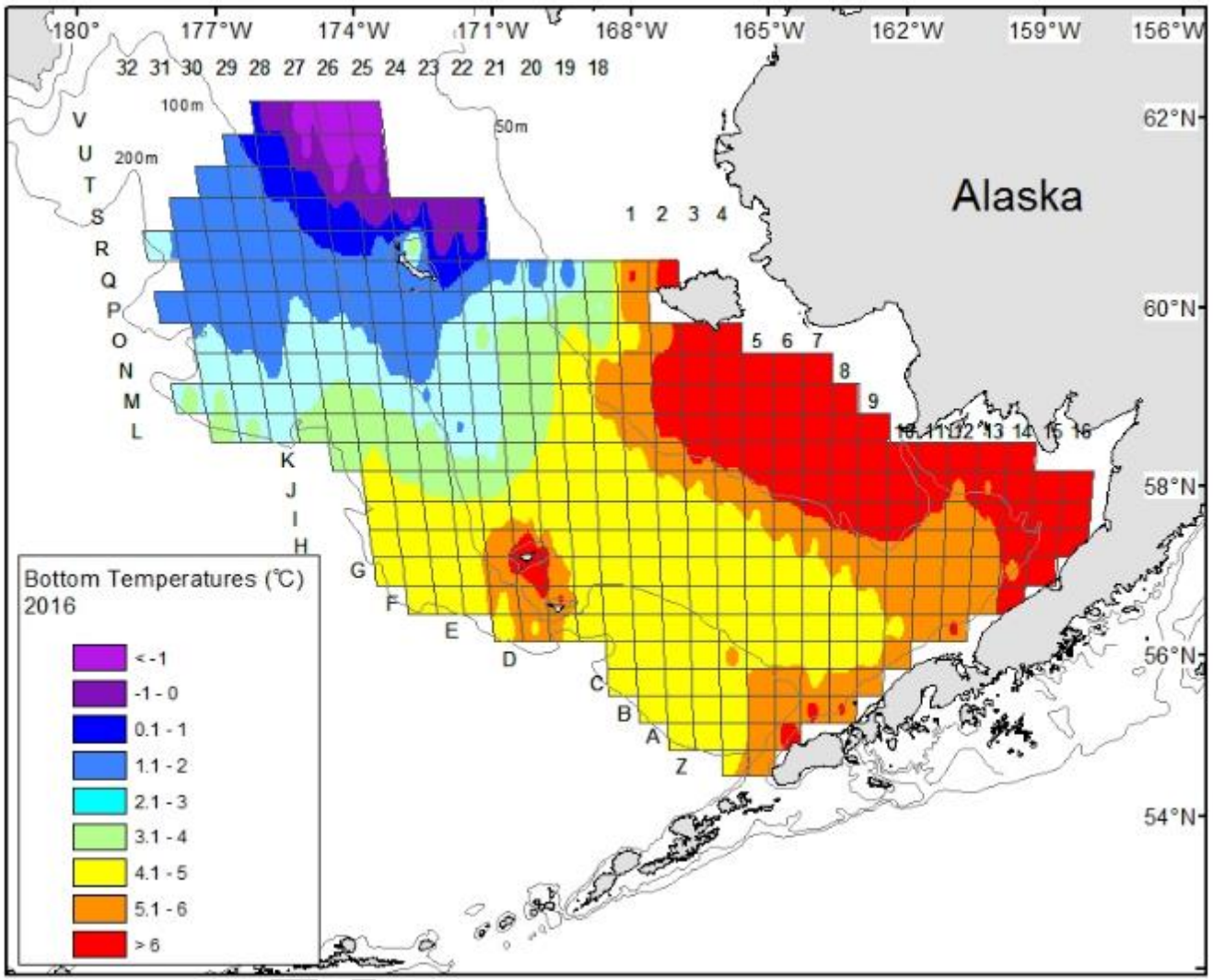

Figure 5. -- Bottom temperatures (°C) measured at stations from the National Marine Fisheries Service eastern Bering Sea bottom trawl survey, beginning 31 May 2016 in Bristol Bay and ending on 26 July 2016 at the western edge of the survey.

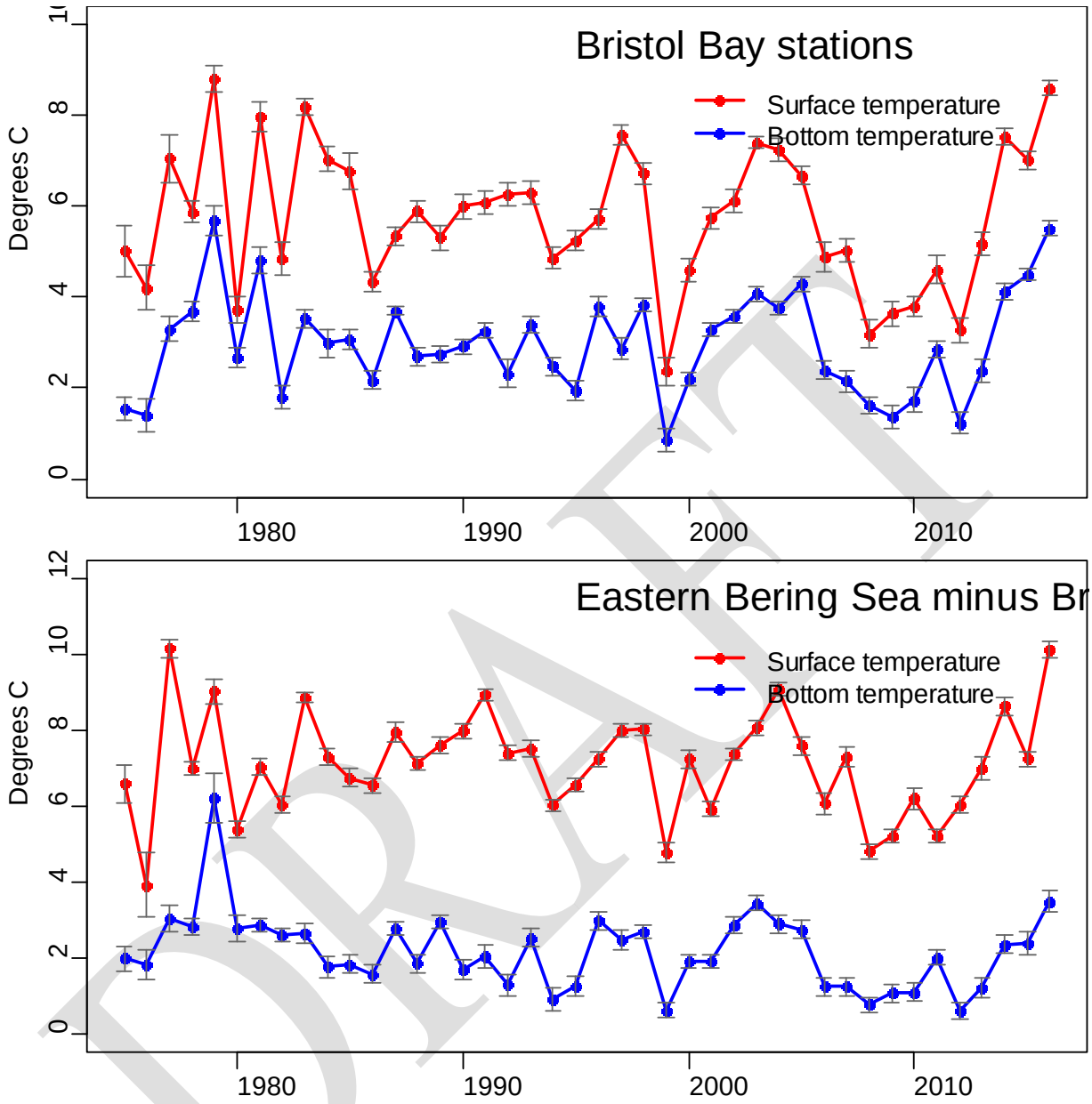

Figure 6. -- Average (± 95% CI) bottom (blue) and surface (red) temperatures for Bristol Bay stations and the rest of the eastern Bering Sea during the National Marine Fisheries Service's eastern Bering Sea bottom trawl survey. The number of stations used to calculate averages was inconsistent among years, particularly as the survey boundary expanded from 1975 to 1987.

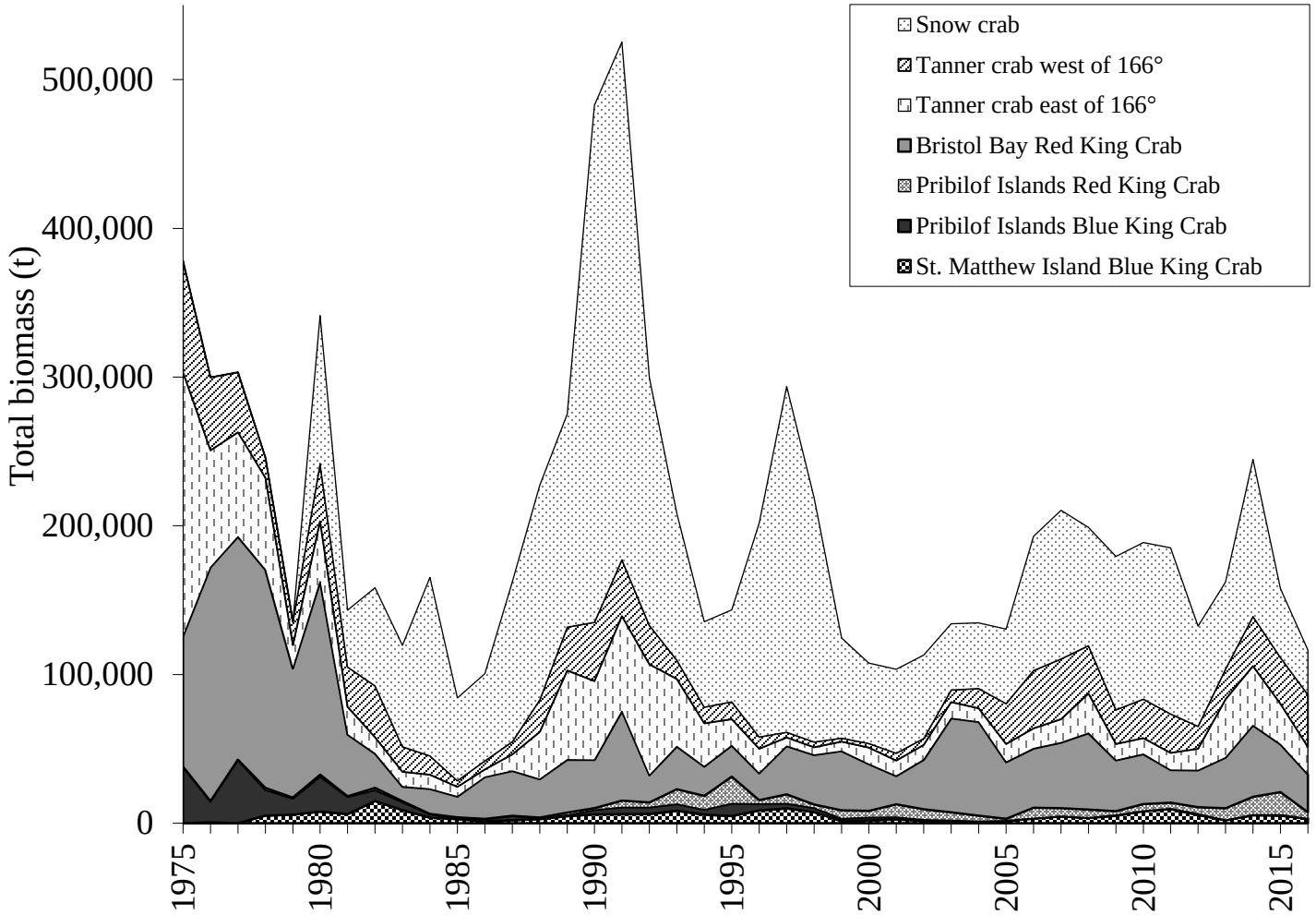

Figure 7. -- Historical mature male biomass (t) for six commercial species caught on National Marine Fisheries Service eastern Bering Sea bottom trawl surveys.

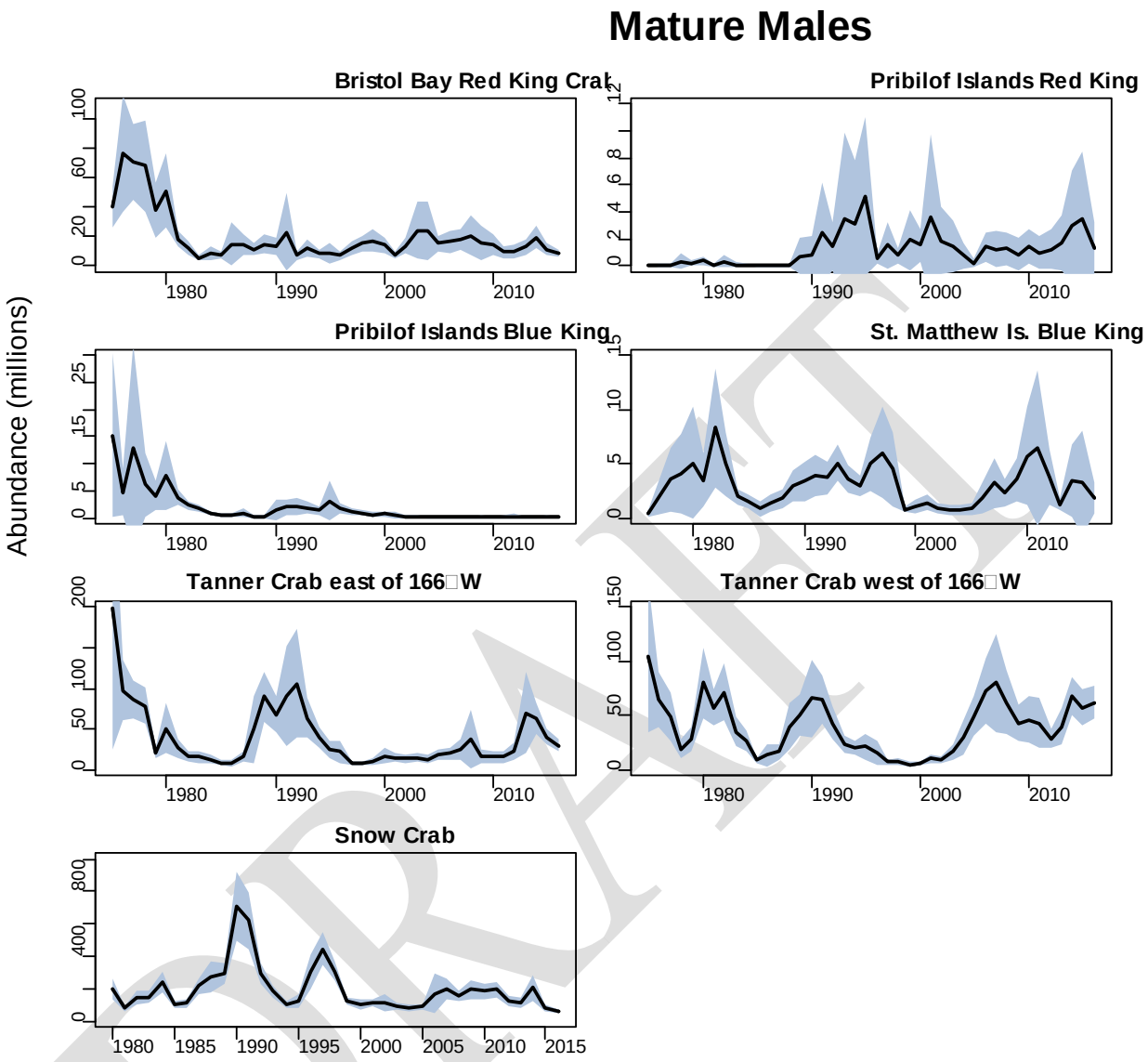

Figure 8. -- Historical mature male abundance (millions, gray area indicates ± 95% CI) for six commercial species caught on the National Marine Fisheries Service eastern Bering Sea bottom trawl surveys (1975-2016).

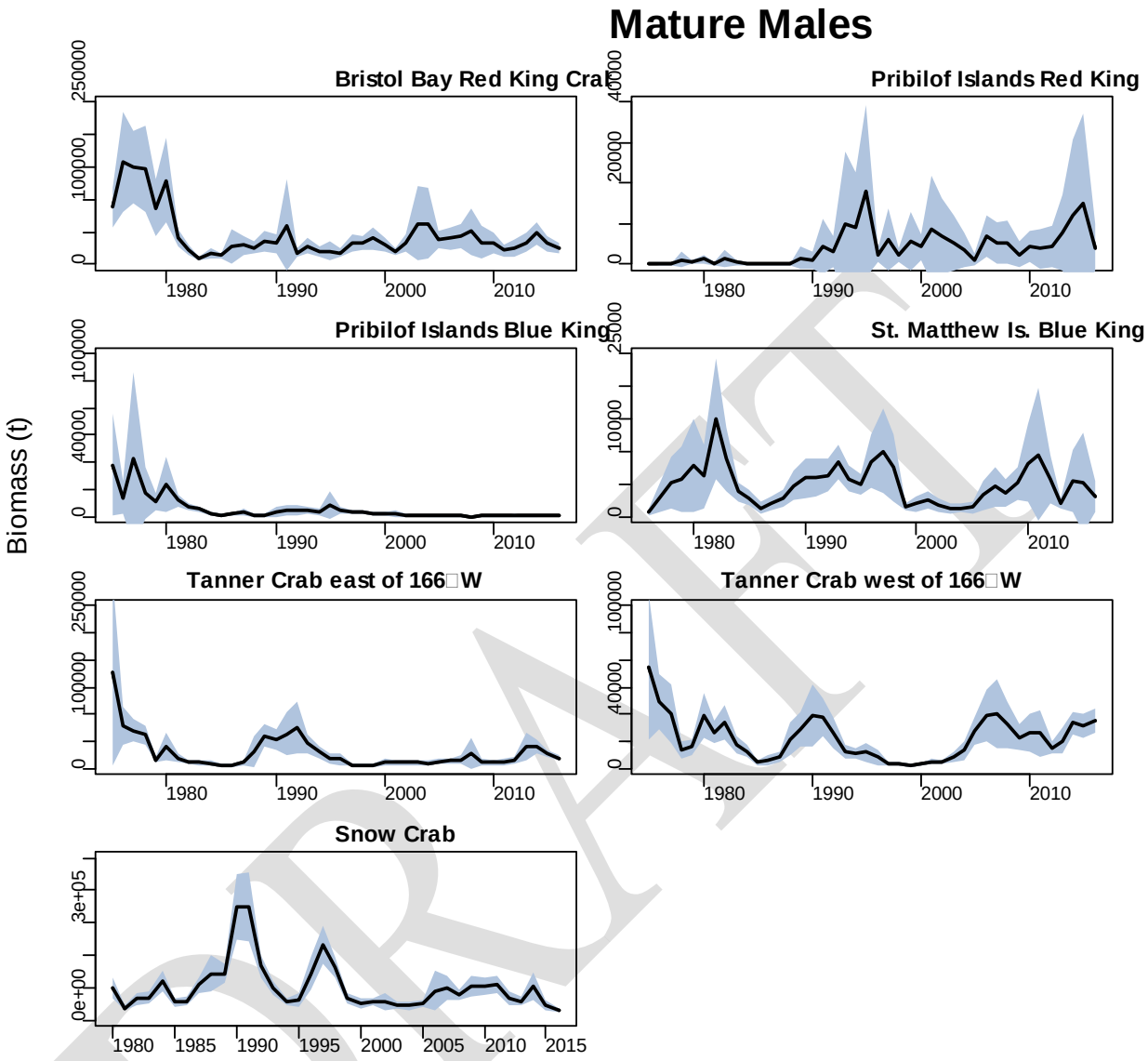

Figure 9. -- Historical mature male biomass (t, gray area indicates ± 95% CI) for six commercial species caught on the National Marine Fisheries Service eastern Bering Sea bottom trawl surveys (1975-2016).

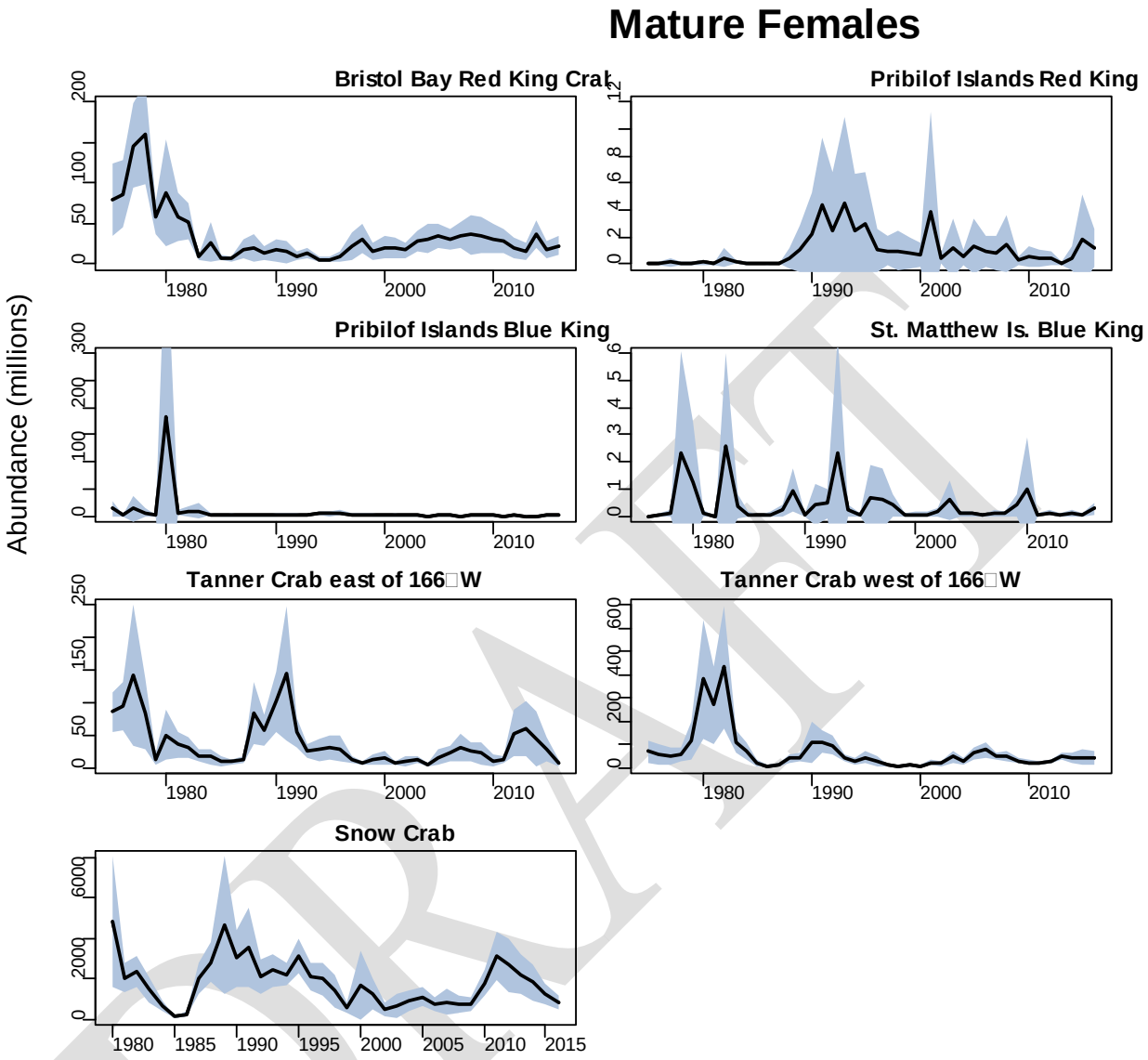

Figure 10. -- Historical mature female abundance (millions, gray area indicates ± 95% CI) for six commercial species caught on the National Marine Fisheries Service eastern Bering Sea bottom trawl survey (1975-2016). Abundance was calculated using actual maturity (abdominal flap morphology and clutch fullness index) as opposed to the size cut-off method used for males.

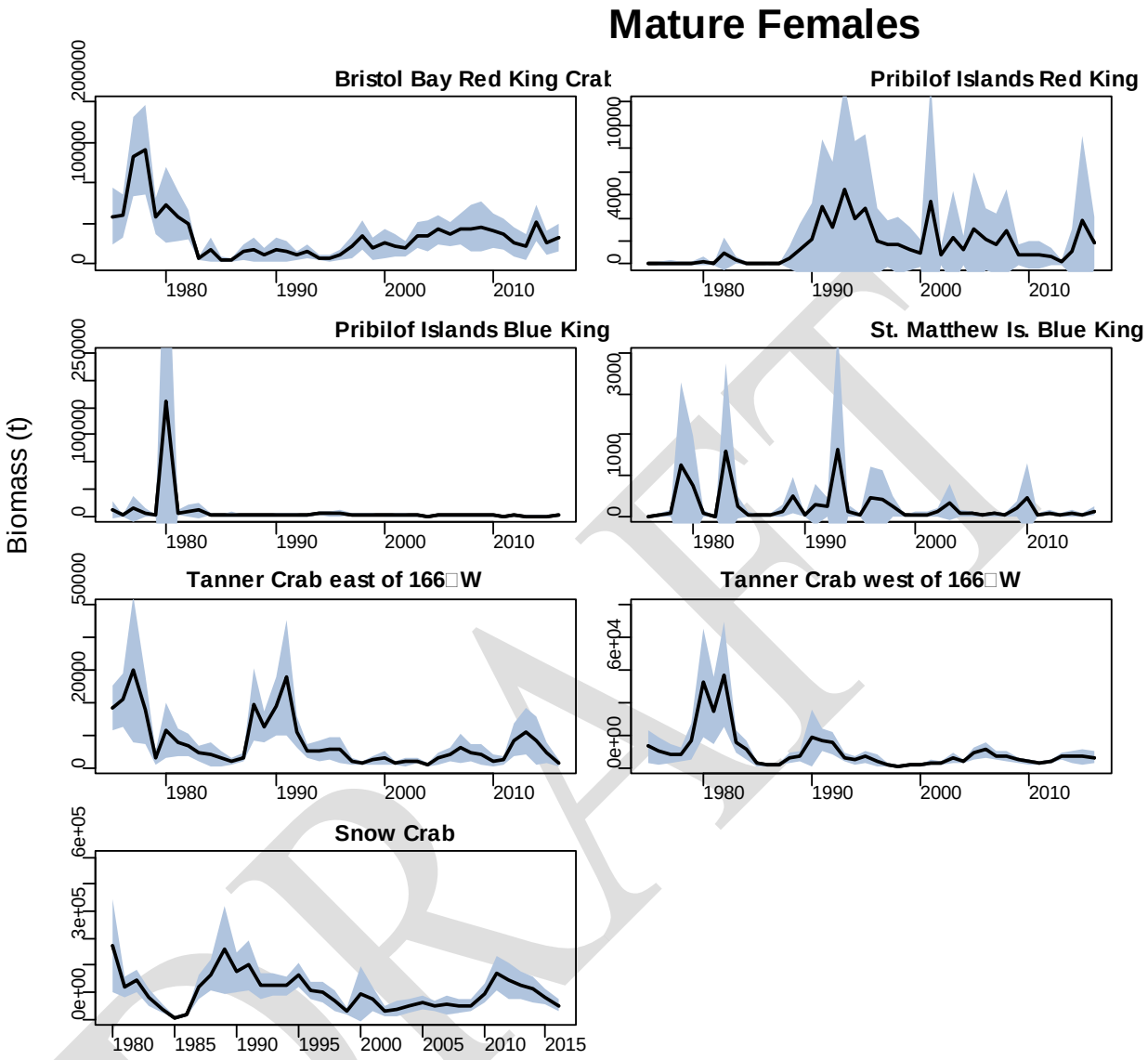

Figure 11. -- Historical mature female biomass (t, gray area indicates ± 95% CI) for six commercial species caught on the National Marine Fisheries Service eastern Bering Sea bottom trawl survey (1975-2016). Biomass was calculated using actual maturity (abdominal flap morphology and clutch fullness index), as opposed to the size cut-off method used for males.

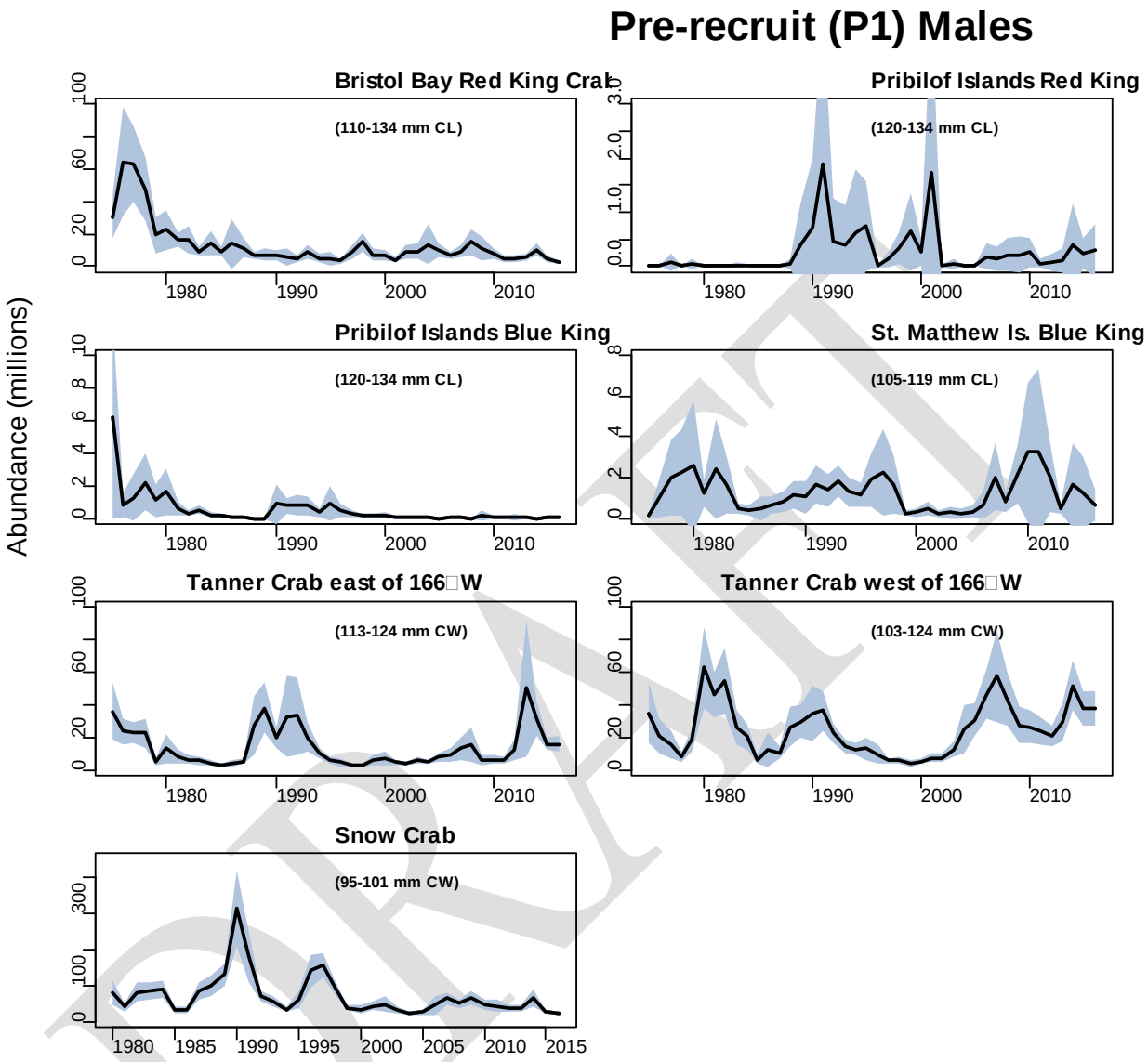

Figure 12. -- Historical abundance (millions, gray area indicates ± 95% CI) of pre-recruit (P1) males for six commercial species caught on the National Marine Fisheries Service eastern Bering Sea bottom trawl survey (1975-2016).

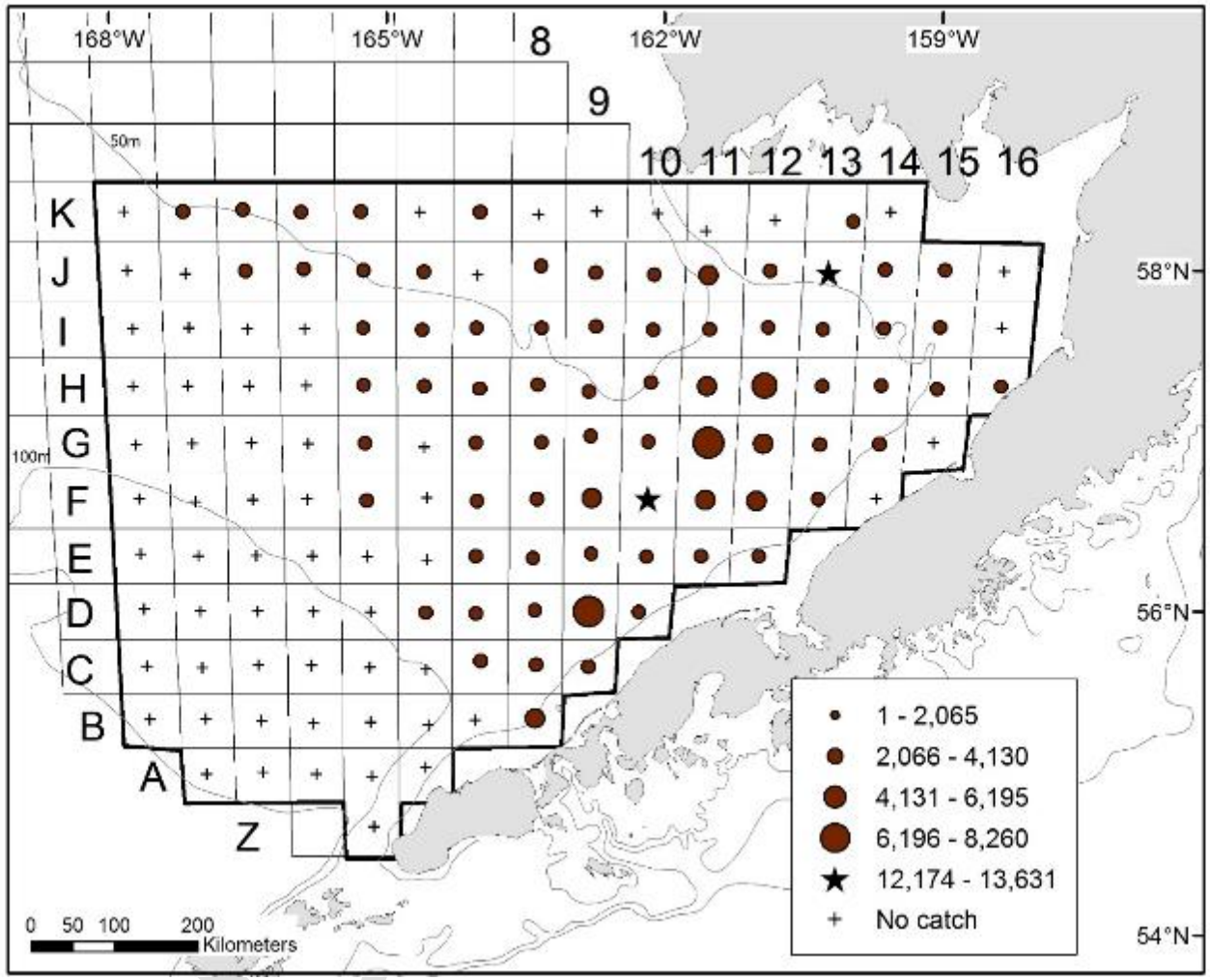

Figure 13. -- Total density (number nmi^{-2}) of red king crab (*Paralithodes camtschaticus*) at each station sampled in the 2016 Bristol Bay District. Data depicted by circles are equal interval densities, while stars represent densities larger than the standard scale. The outlined area depicts the management district.

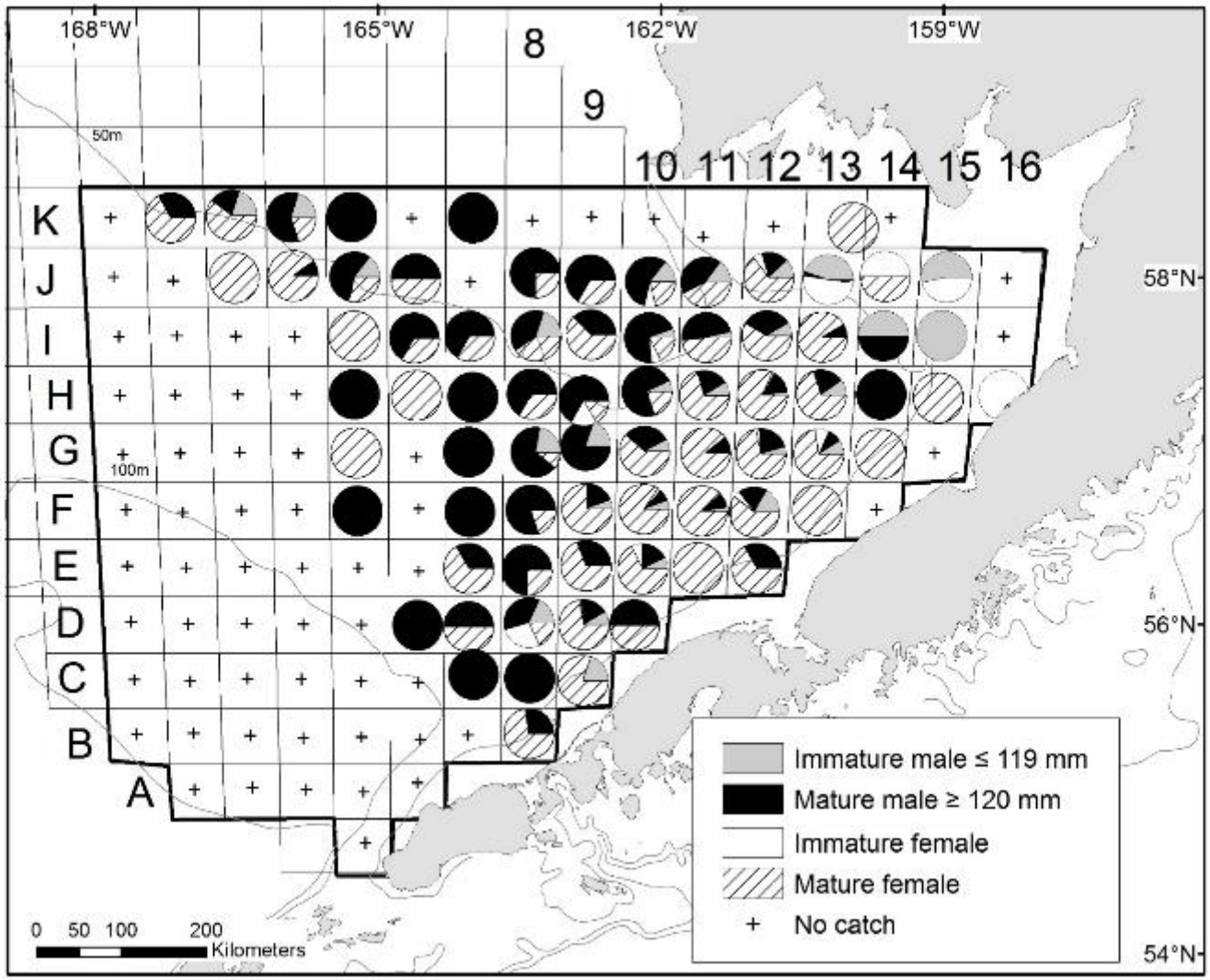

Figure 14. -- Percentage of male and female red king crab (*Paralithodes camtschaticus*) maturity classes caught at each station of the Bristol Bay District in 2016. The outlined area depicts management district.

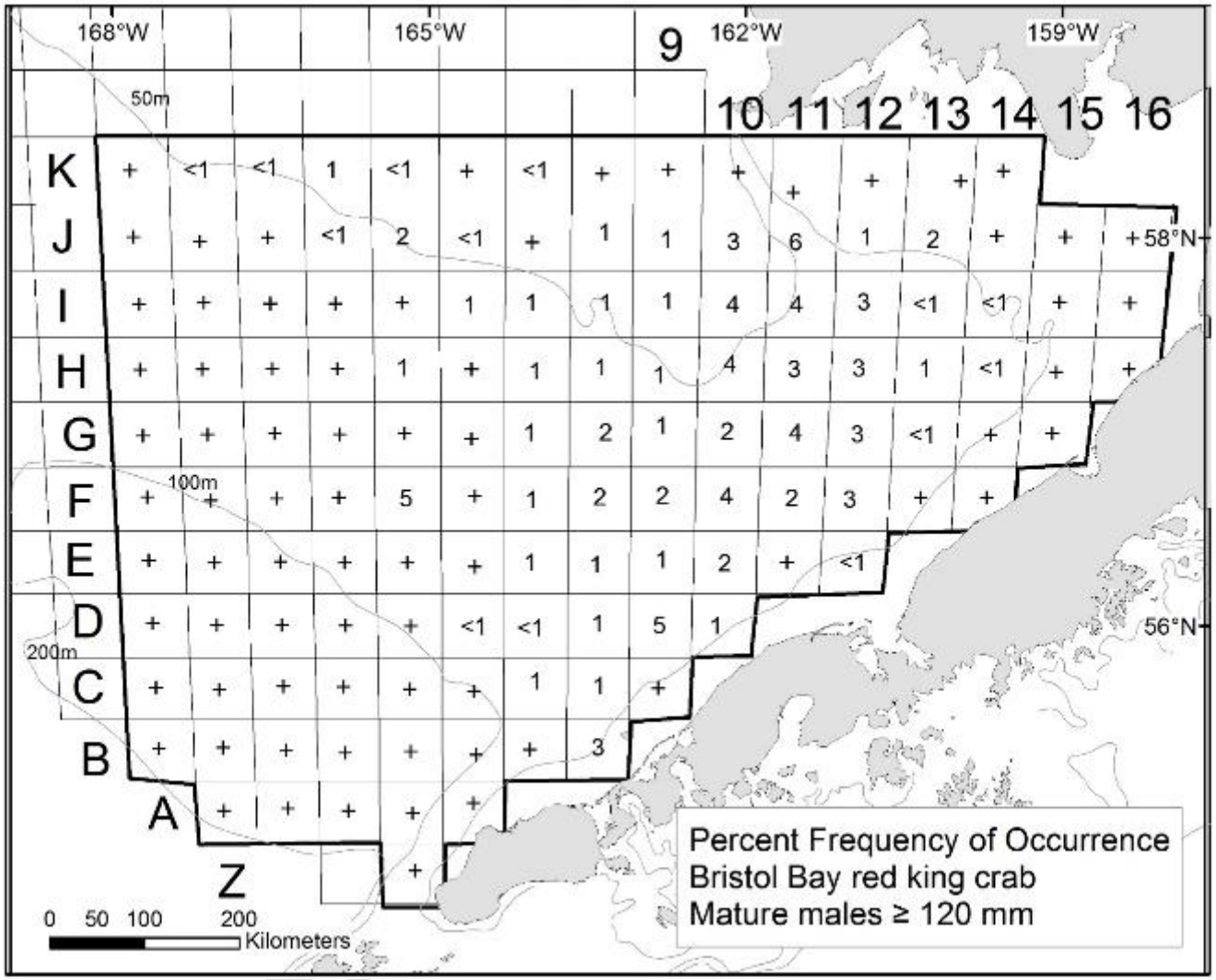

Figure 15. -- Percent frequency of occurrence of mature male red king crab (*Paralithodes camtschaticus*) at stations sampled in the 2016 Bristol Bay District. The outlined area depicts management district.

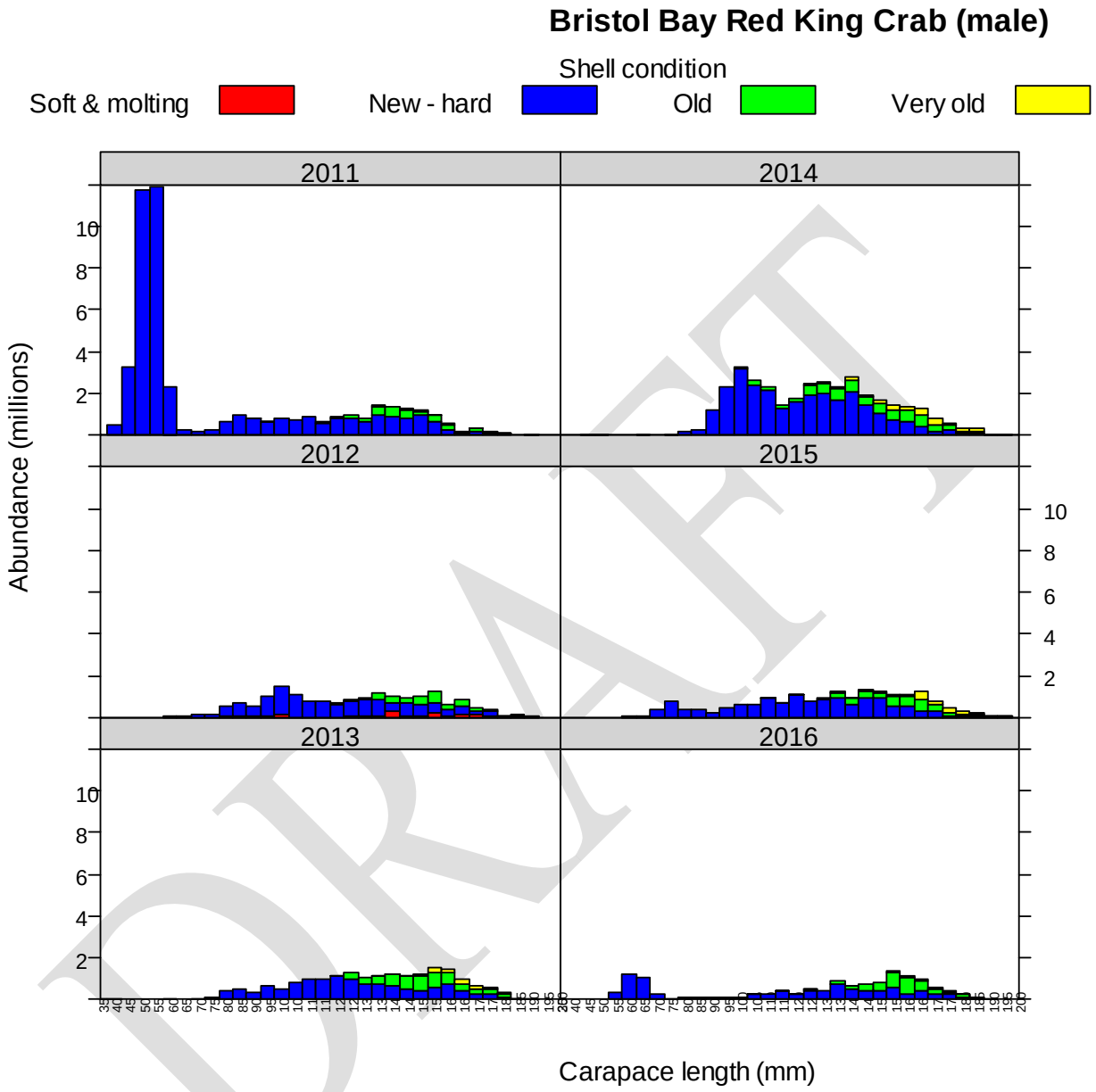

Figure 16. -- Size frequency by shell condition of Bristol Bay District male red king crab (*Paralithodes camtschaticus*) by 5 mm length classes, 2011-2016.

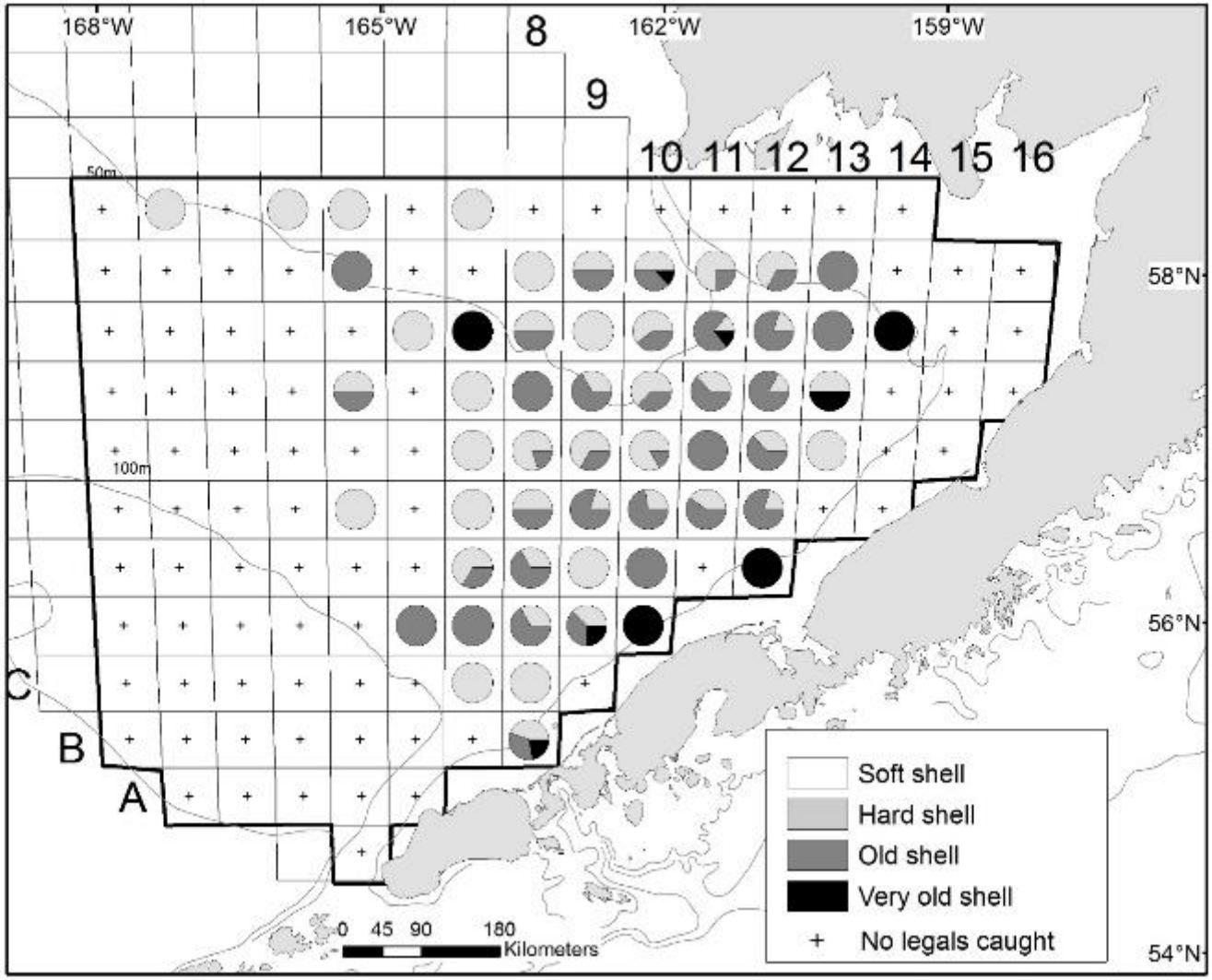

Figure 17. -- Distribution of legal-sized male red king crab (*Paralithodes camtschaticus*) caught at each station in the 2016 Bristol Bay District distinguished by shell condition. The outlined area depicts management district.

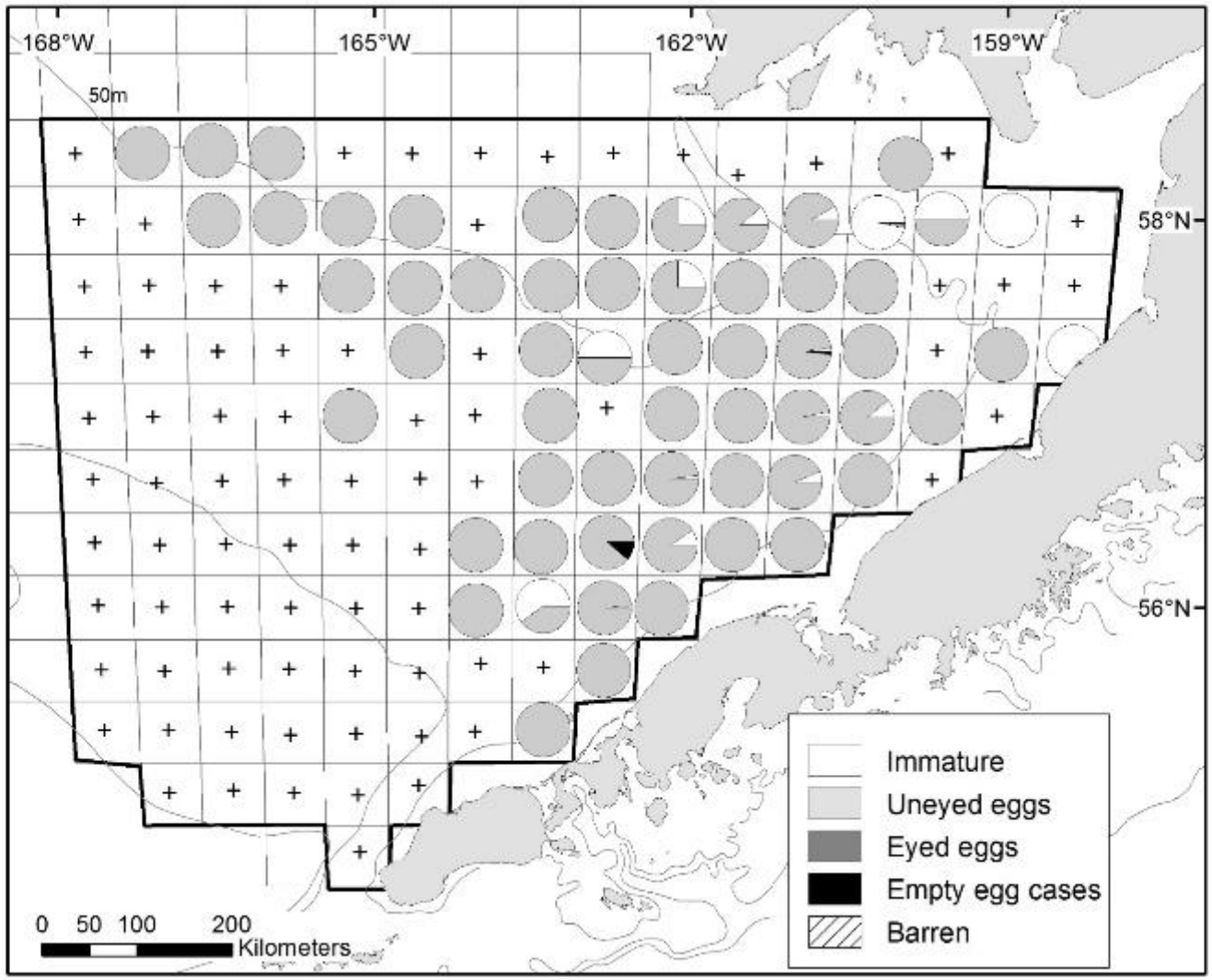

Figure 18. -- Distribution and egg condition of female red king crab (*Paralithodes camtschaticus*) in the Bristol Bay District in 2016. The outlined area depicts management district.

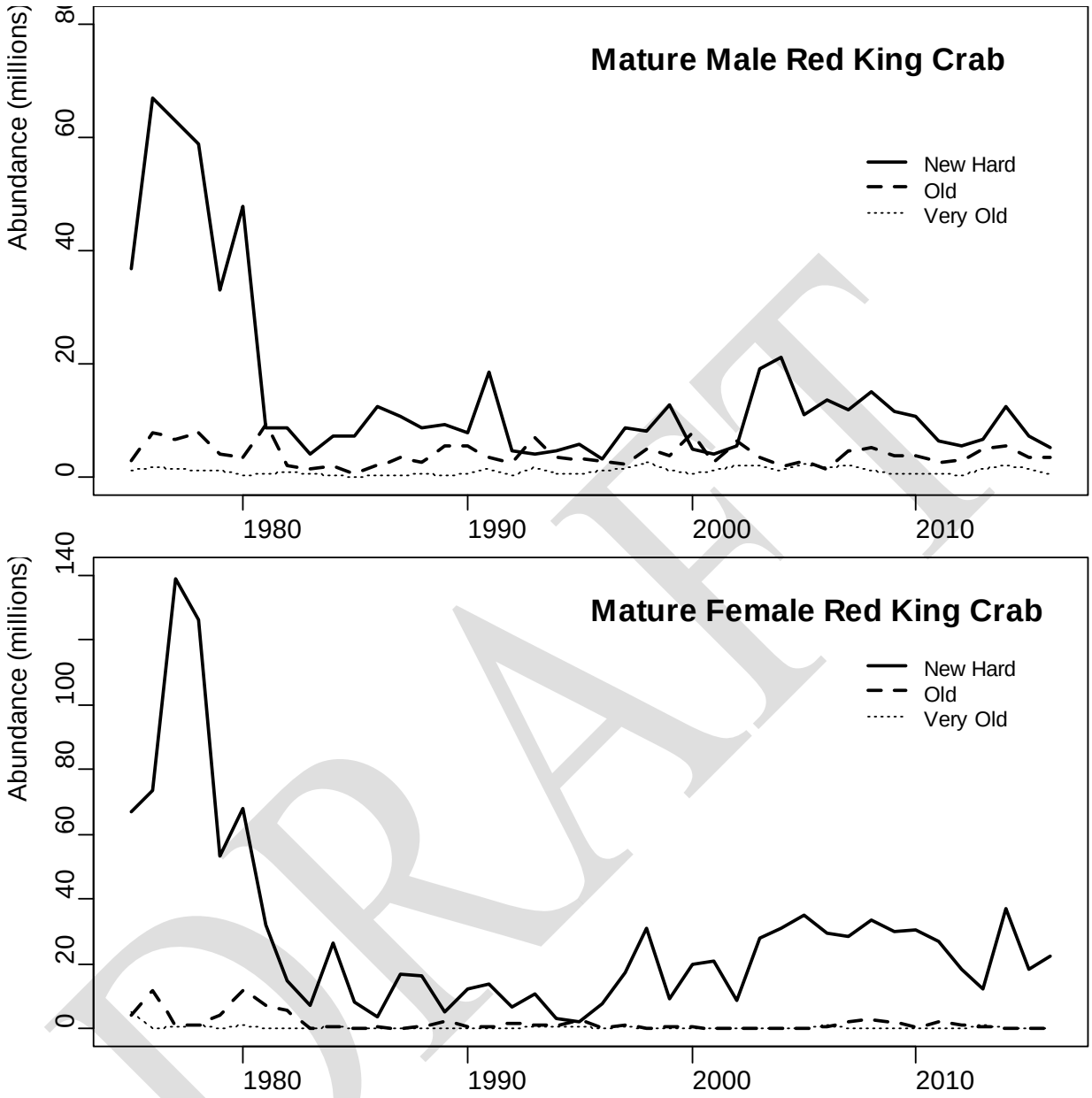

Figure 19. -- Time series of mature male (≥120 mm CL) and female (actual maturity) Bristol Bay District red king crab (*Paralithodes camtschaticus*) by shell condition, 1975-2016. New- Hard = shell condition 2; Old = shell condition 3; Very Old = shell condition 4 and 5 combined.

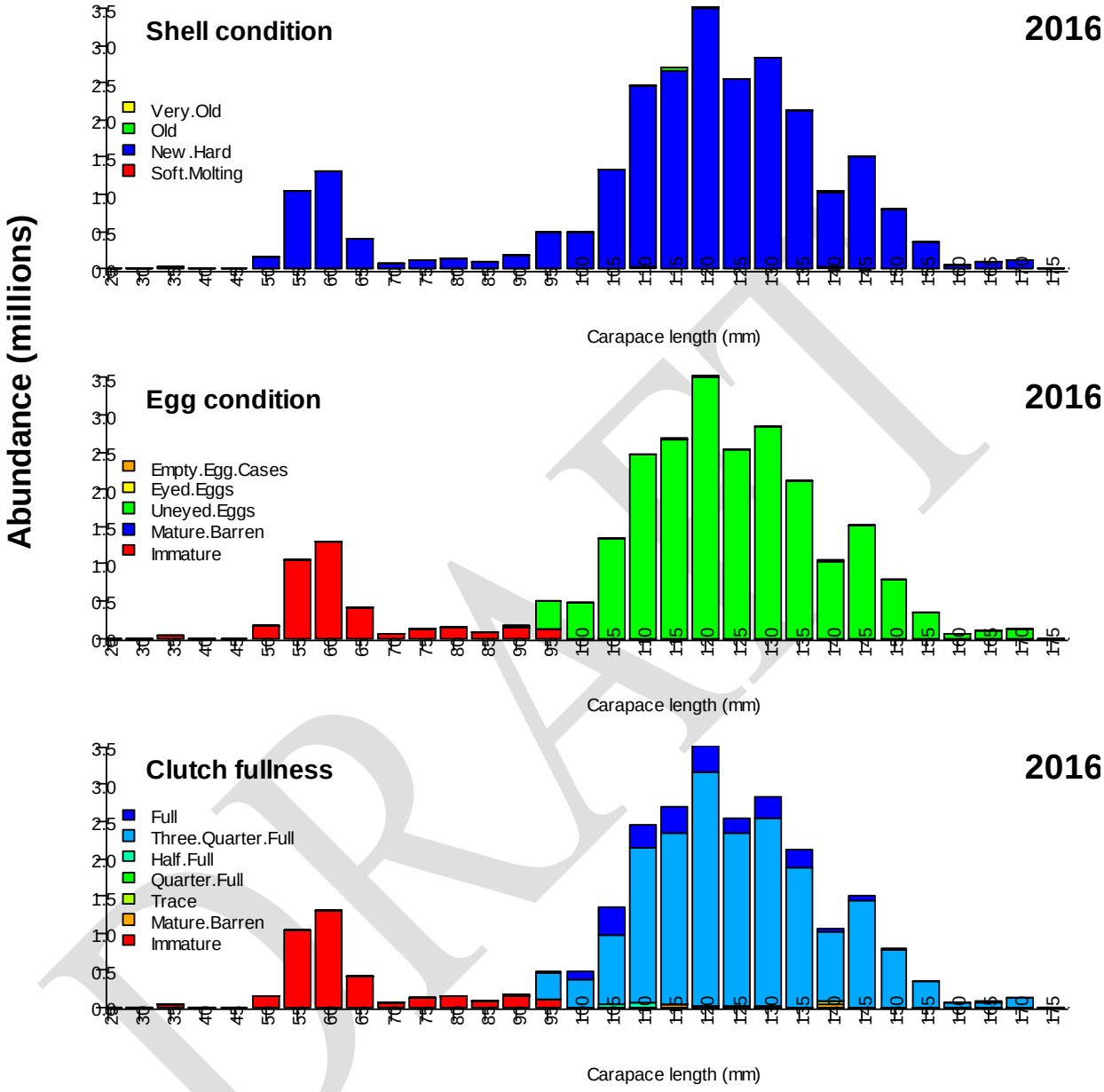

Figure 20. -- Size frequency by shell condition, egg condition, and clutch fullness of Bristol Bay District female red king crab (*Paralithodes camtschaticus*) by 5 mm length classes in 2016.

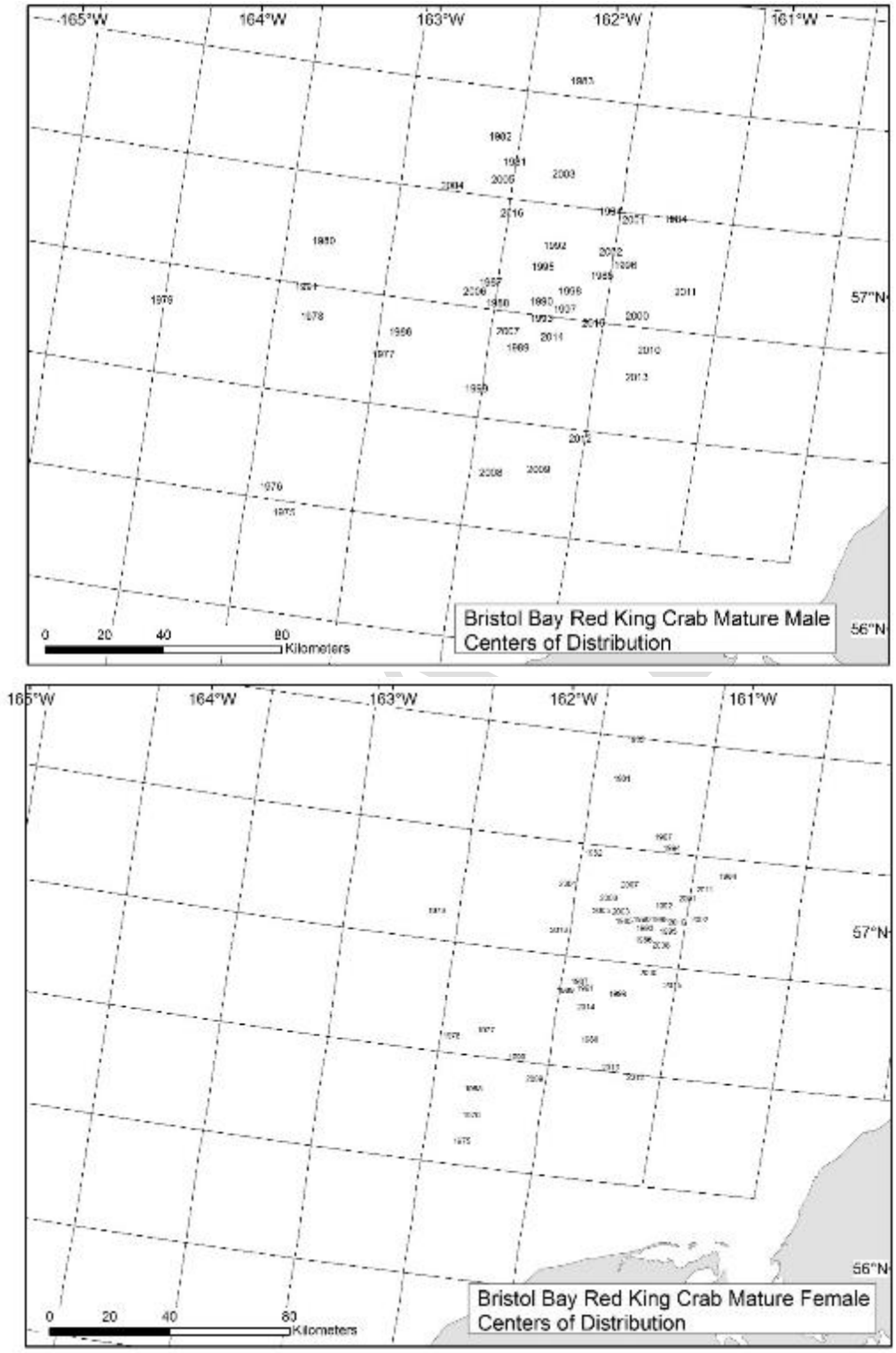

Figure 21. -- Centers of stock distribution of Bristol Bay District mature male and female red king crab (*Paralithodes camtschaticus*) from 1975 to 2016.

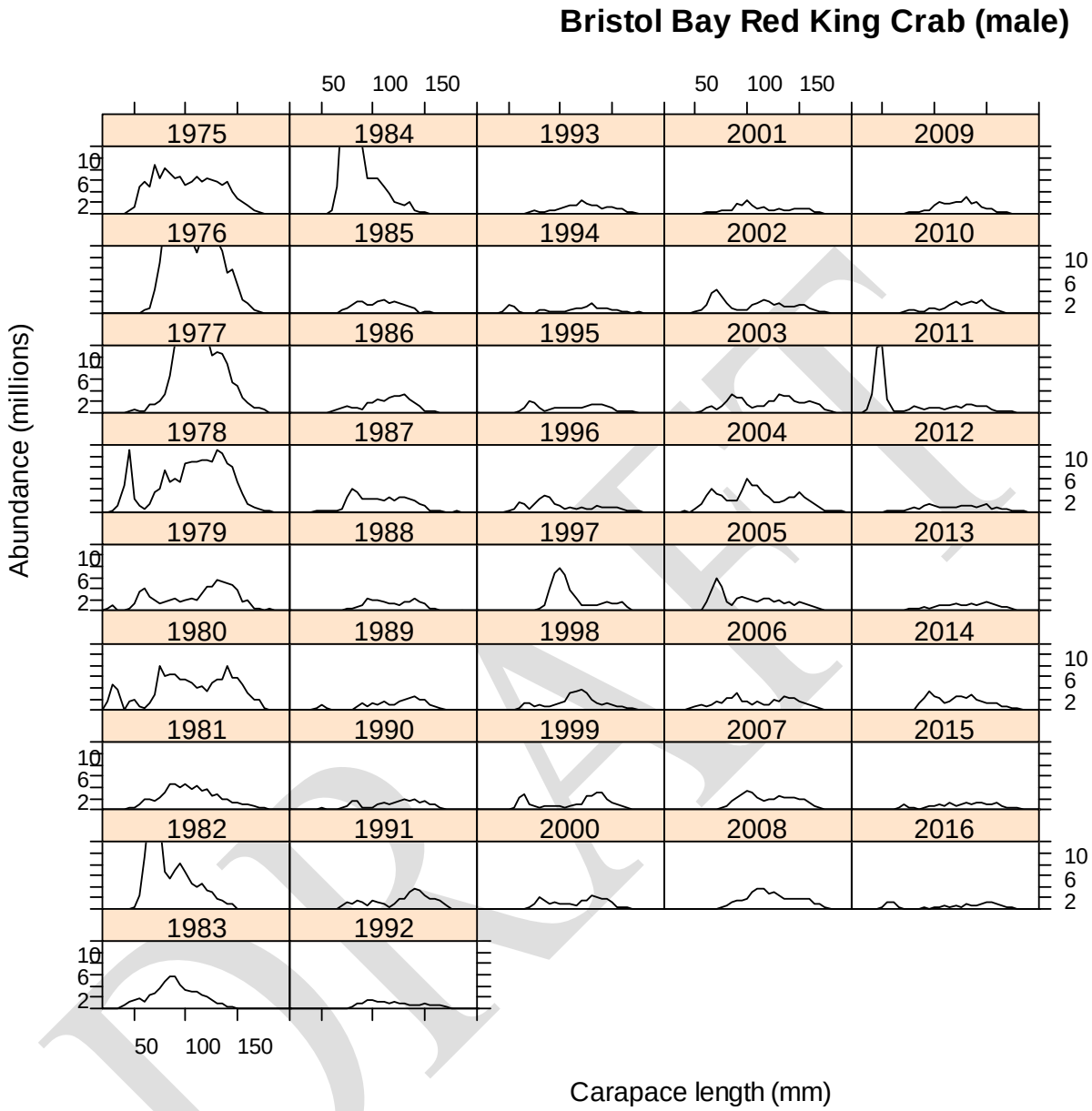

Figure 22. -- Historical size frequency by 5 mm length classes of Bristol Bay District male red king crab (*Paralithodes camtschaticus*), 1975 to 2016.

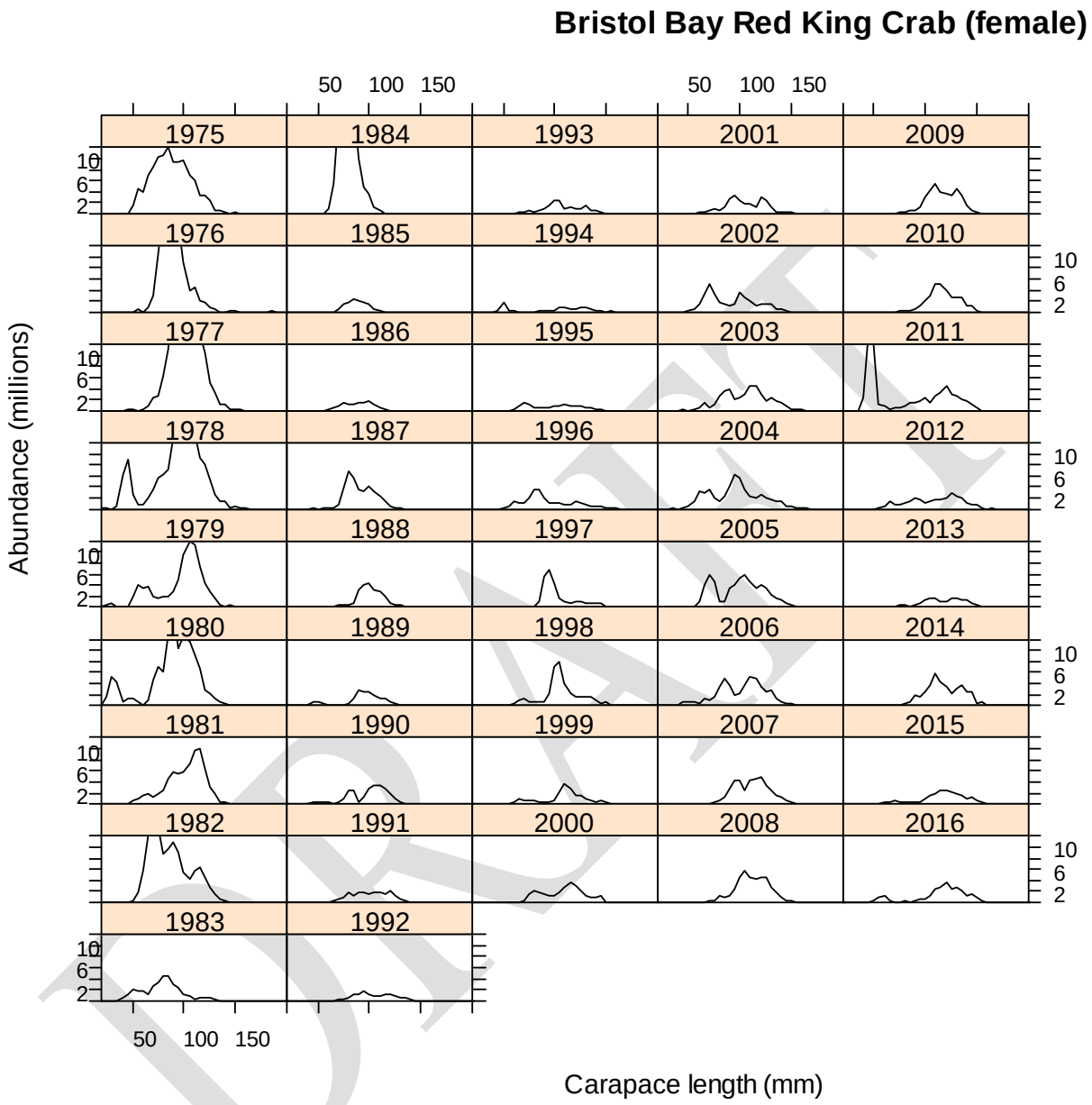

Figure 23. -- Historical size frequency by 5 mm length classes of Bristol Bay District female red king crab (*Paralithodes camtschaticus*), 1975 to 2016.

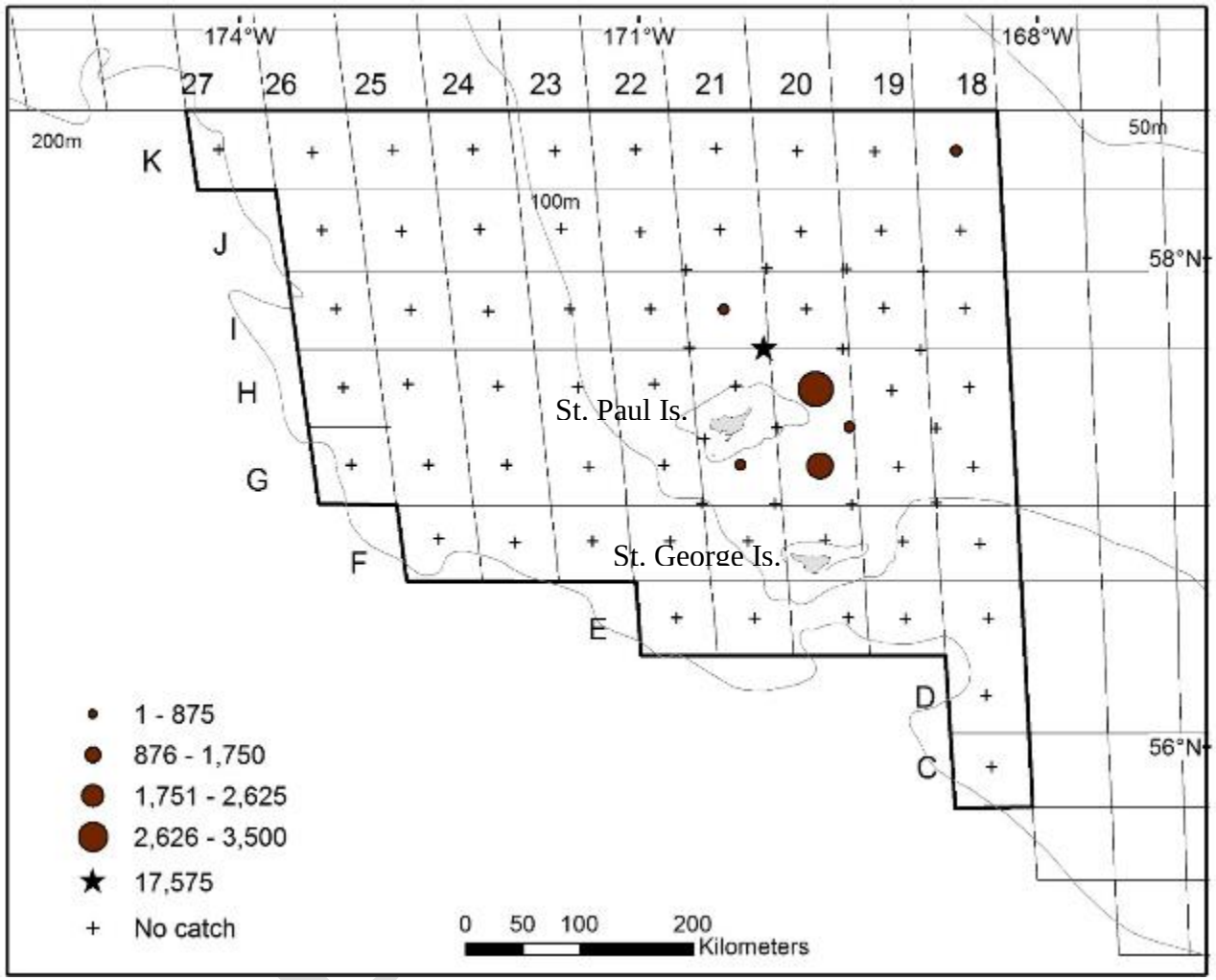

Figure 24. -- Total density (number nmi^{-2}) of red king crab (*Paralithodes camtschaticus*) at each station sampled in the Pribilof District in 2016. Data depicted by circles are equal interval densities, while stars represent densities larger than the standard scale. The outlined area depicts stations within the management district.

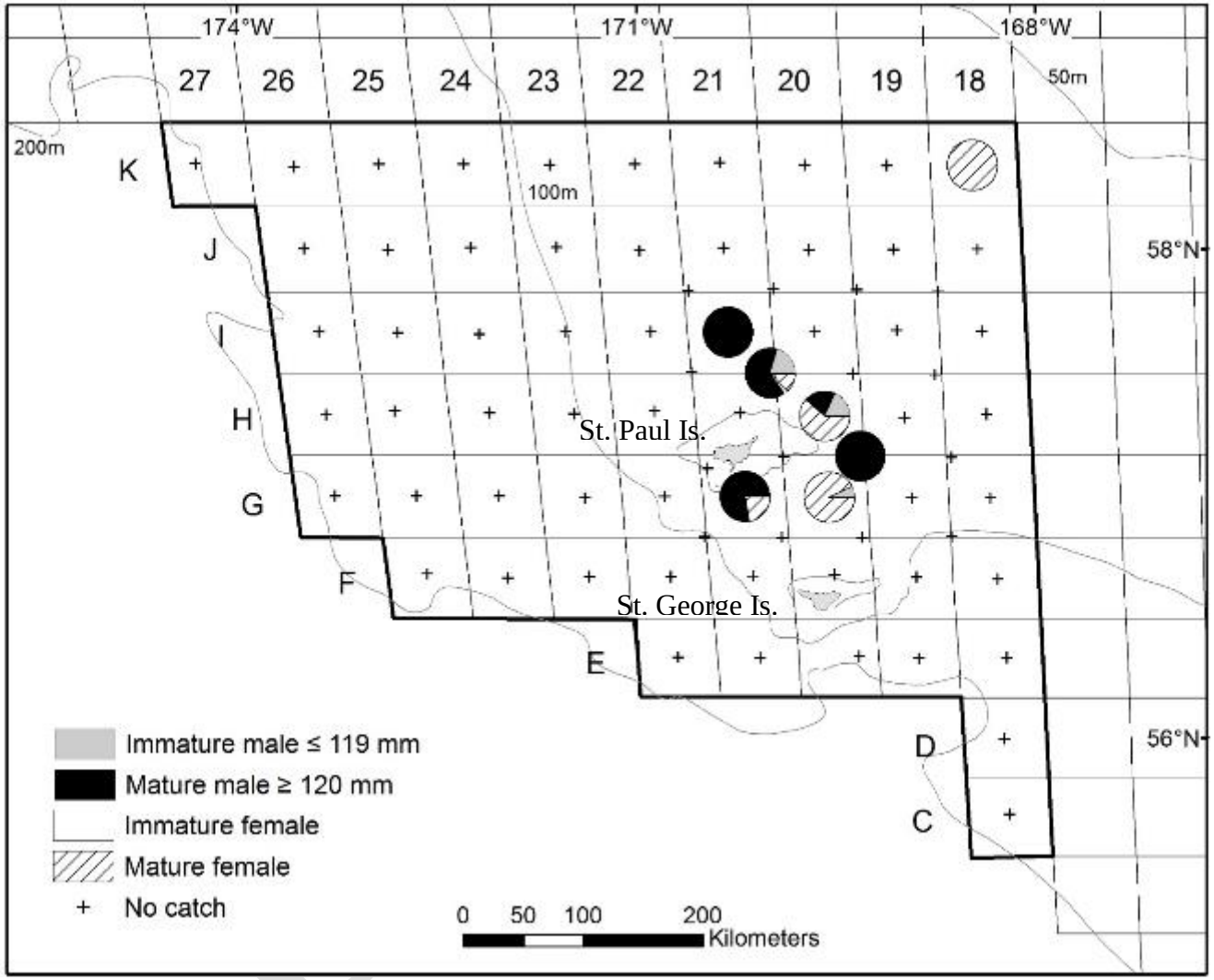

Figure 25. -- Percentage of male and female red king crab (*Paralithodes camtschaticus*) maturity classes at each station of the Pribilof District in 2016. The outlined area depicts stations within the management district.

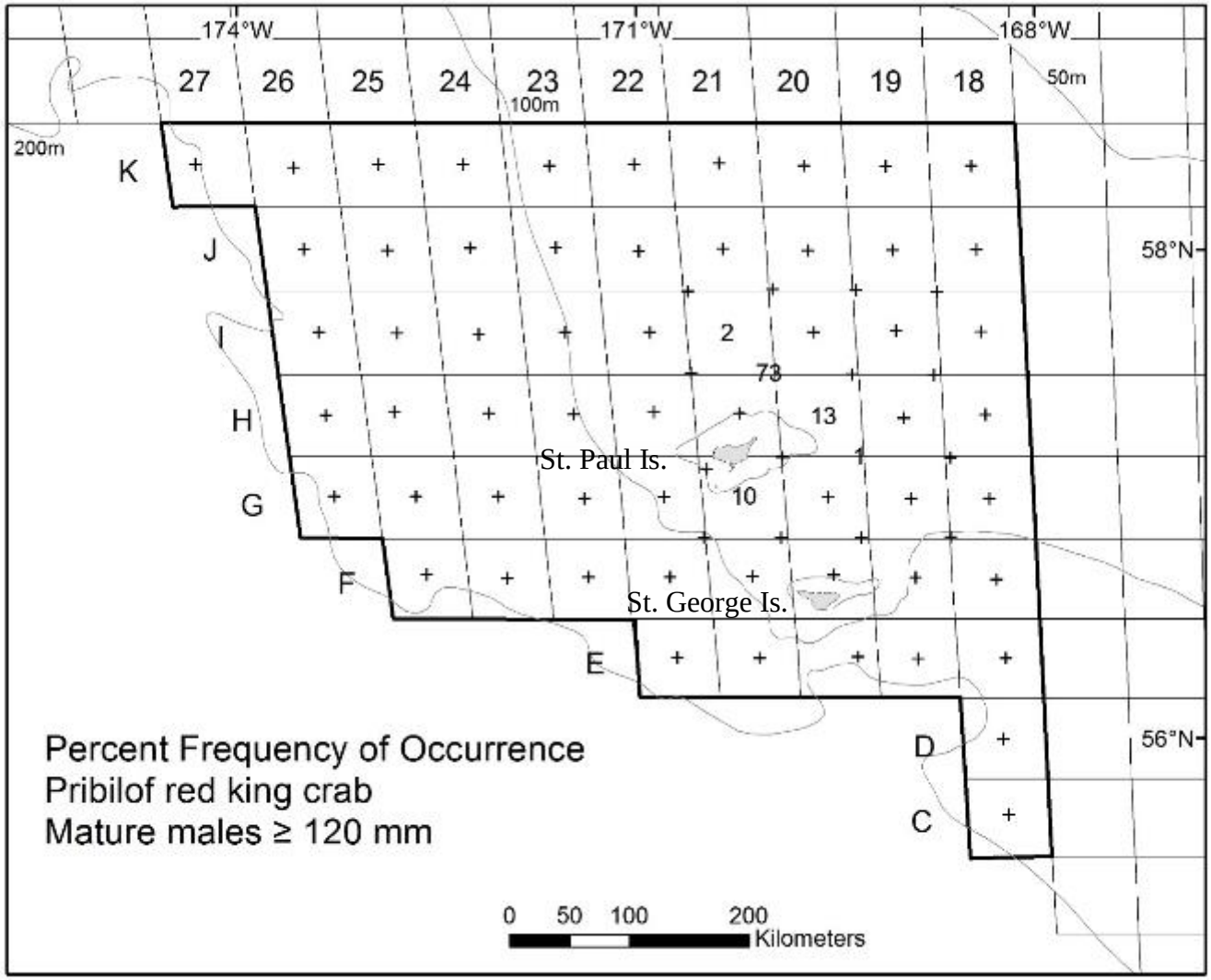

Figure 26. -- Percent frequency of occurrence of mature male red king crab (*Paralithodes camtschaticus*) at stations sampled in the 2016 Pribilof District.

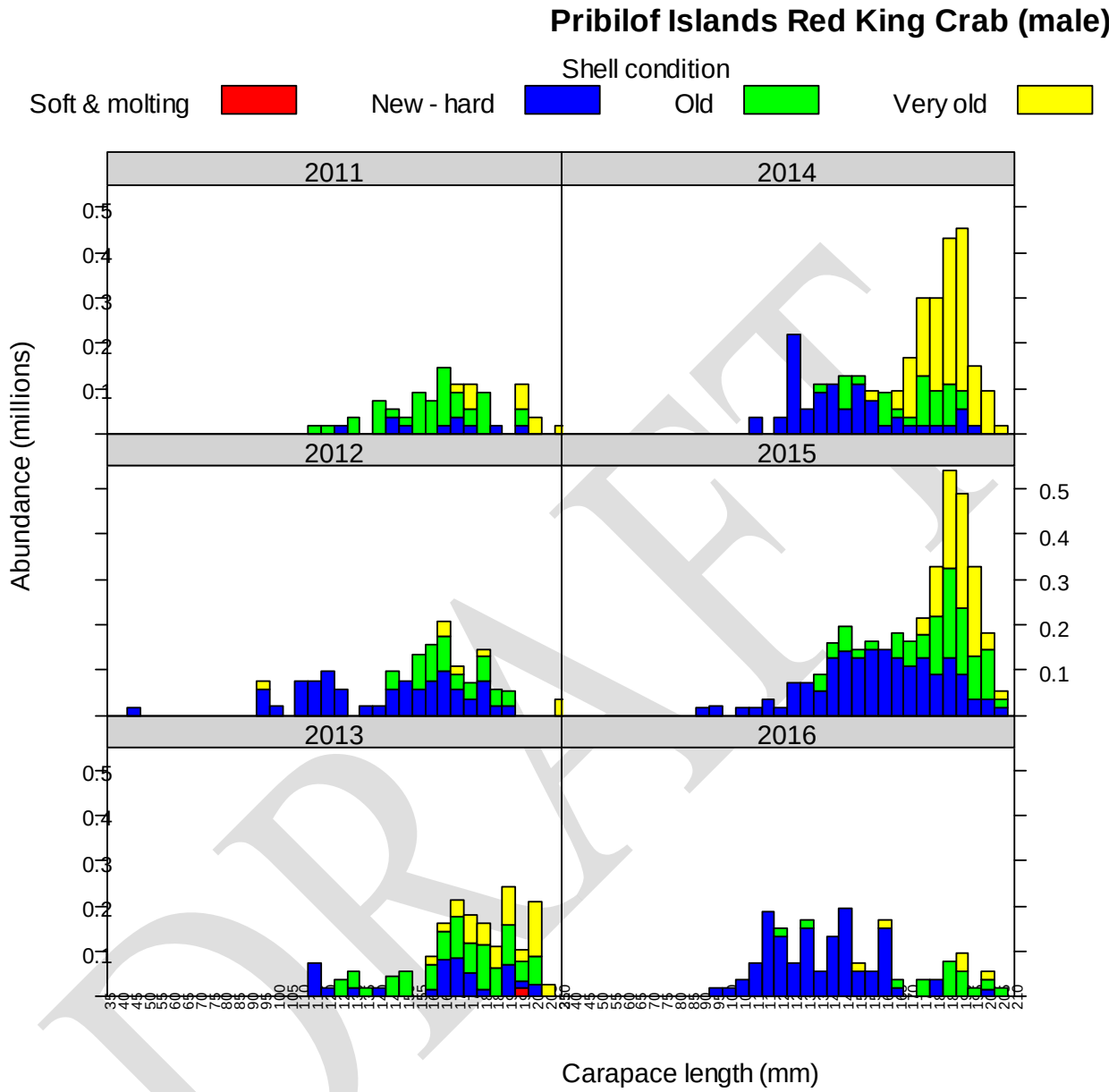

Figure 27. -- Size frequency by shell condition of Pribilof District male red king crab (*Paralithodes camtschaticus*) by 5 mm length classes, 2011-2016.

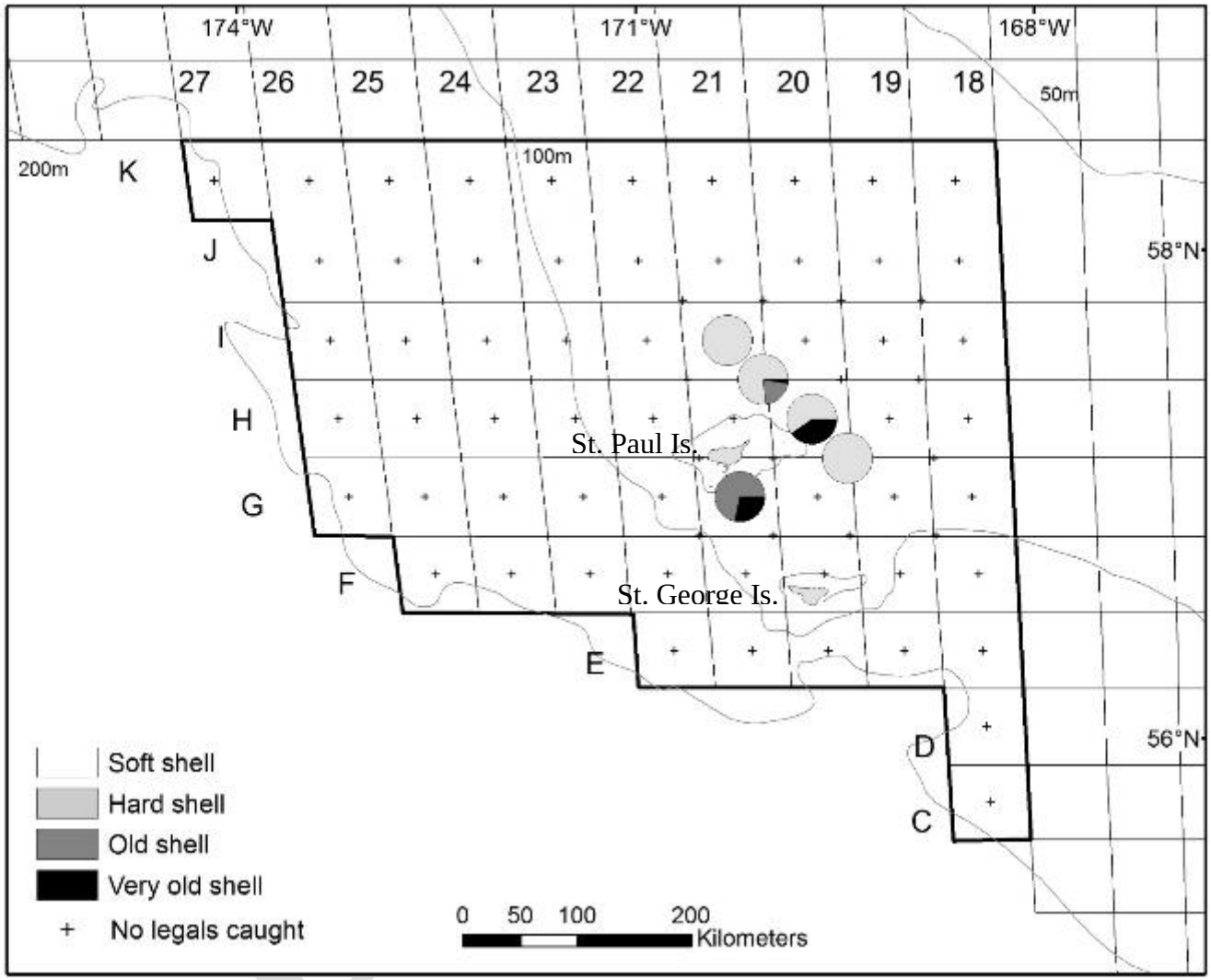

Figure 28. -- Distribution of legal-sized male red king crab (*Paralithodes camtschaticus*) caught at each station of the Pribilof District in 2016 and distinguished by shell condition. The outlined area depicts stations within the management district.

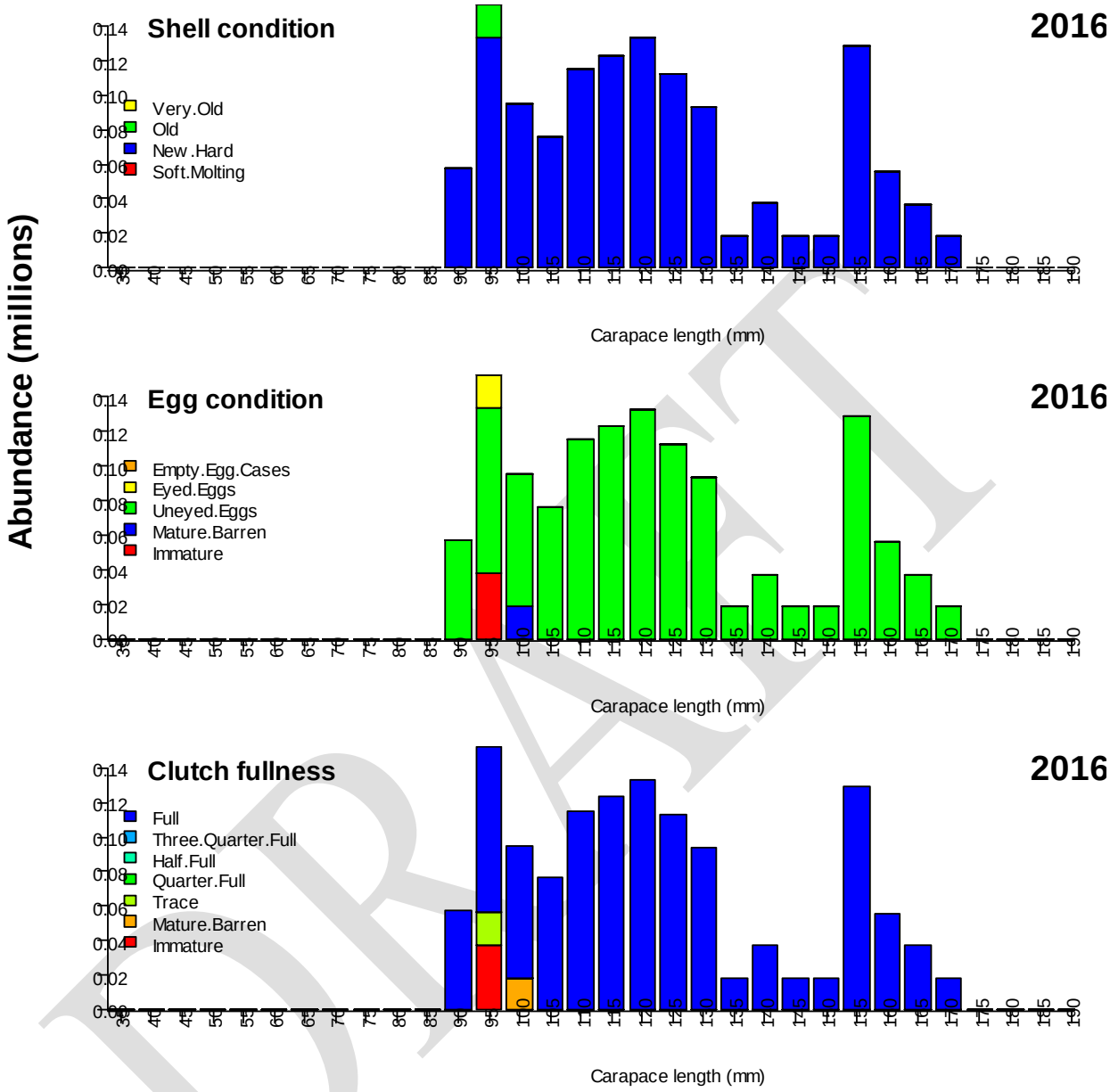

Figure 29. -- Size frequency by shell condition, egg condition, and clutch fullness of Pribilof District female red king crab (*Paralithodes camtschaticus*) by 5 mm length classes in 2016.

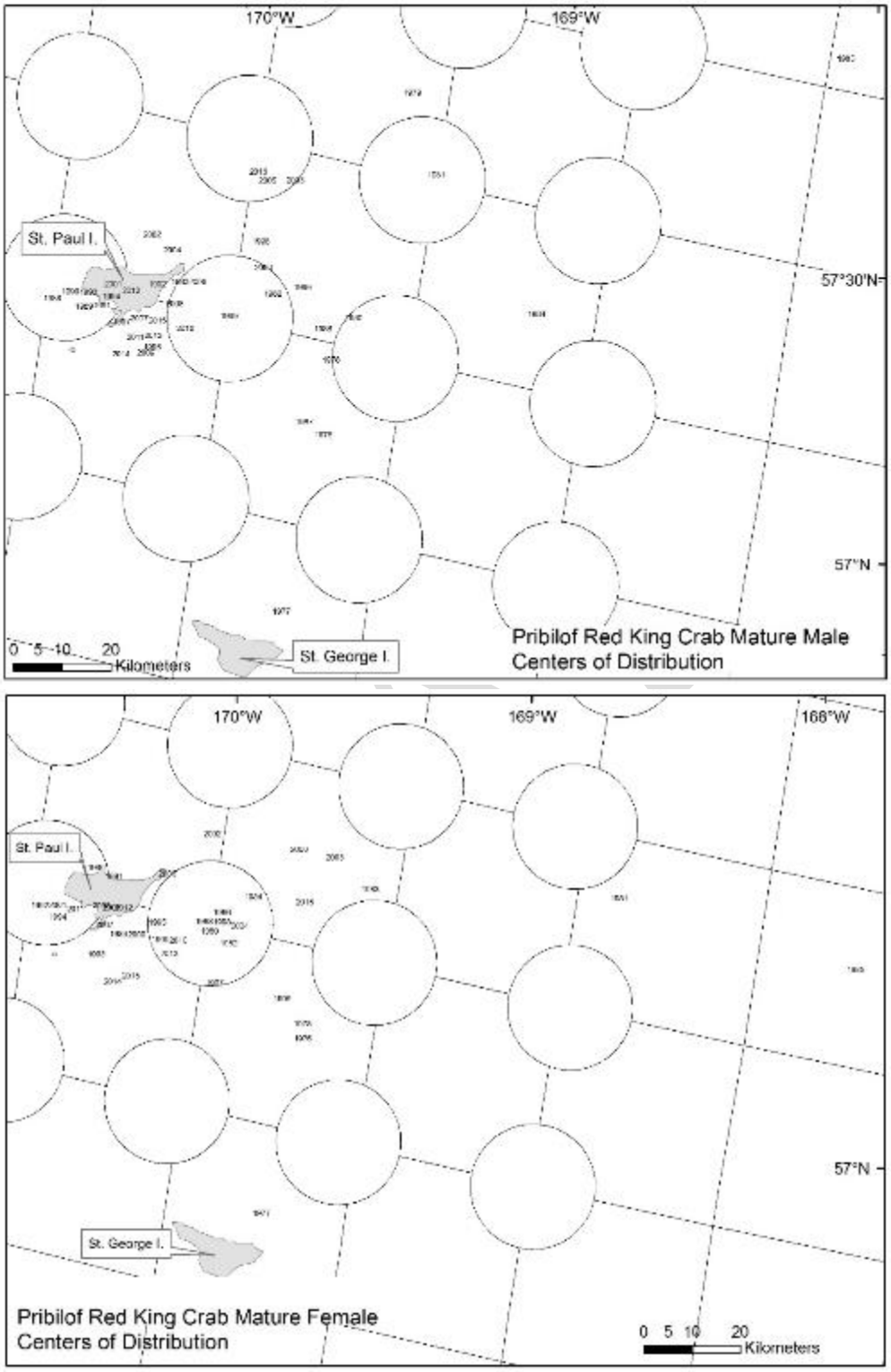

Figure 30. -- Centers of stock distribution of Pribilof Islands male and female red king crab (*Paralithodes camtschaticus*) from 1975 to 2016.

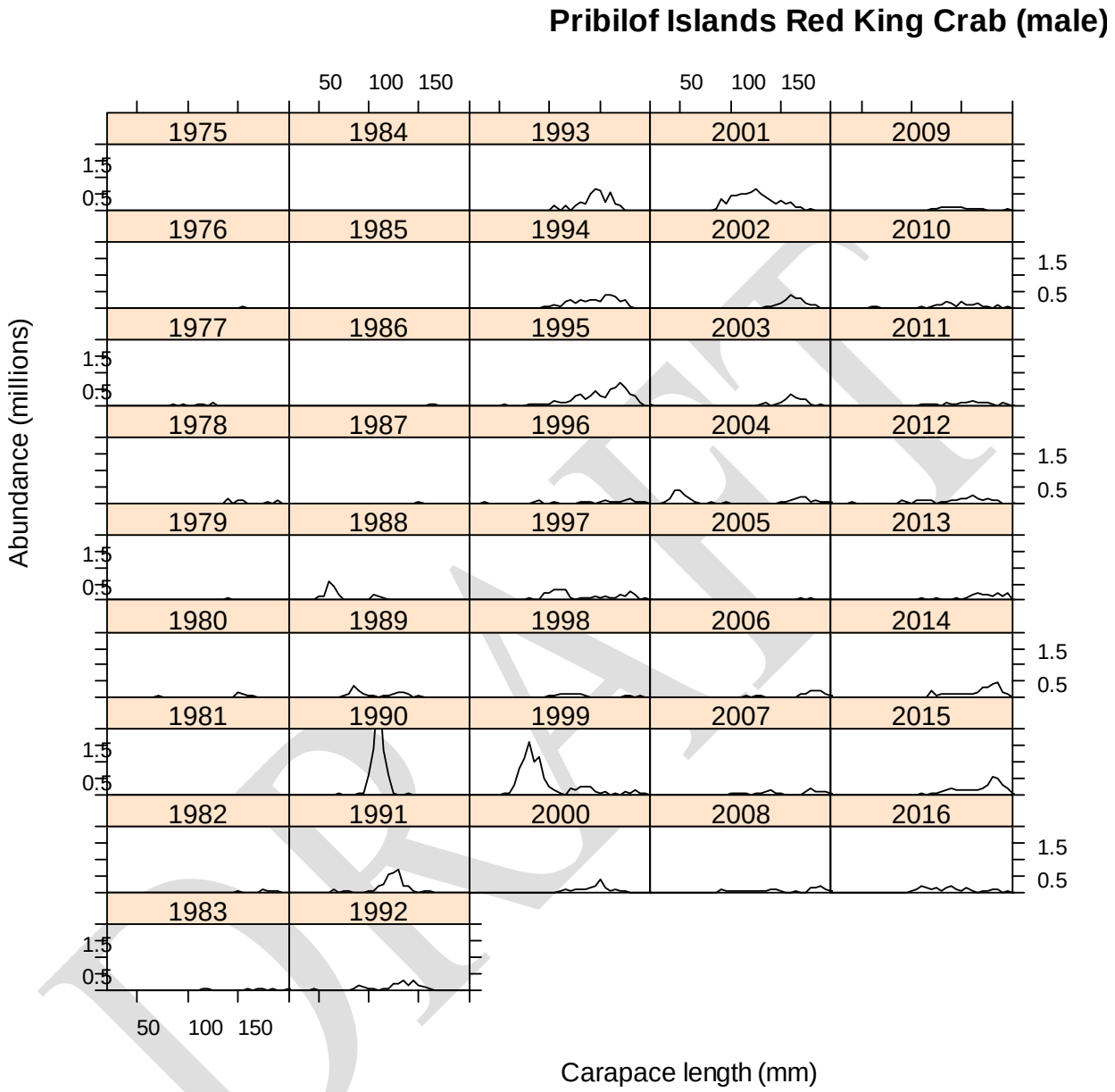

Figure 31. -- Size frequency by 5 mm length classes of Pribilof Islands male red king crab (*Paralithodes camtschaticus*) from 1975 to 2016.

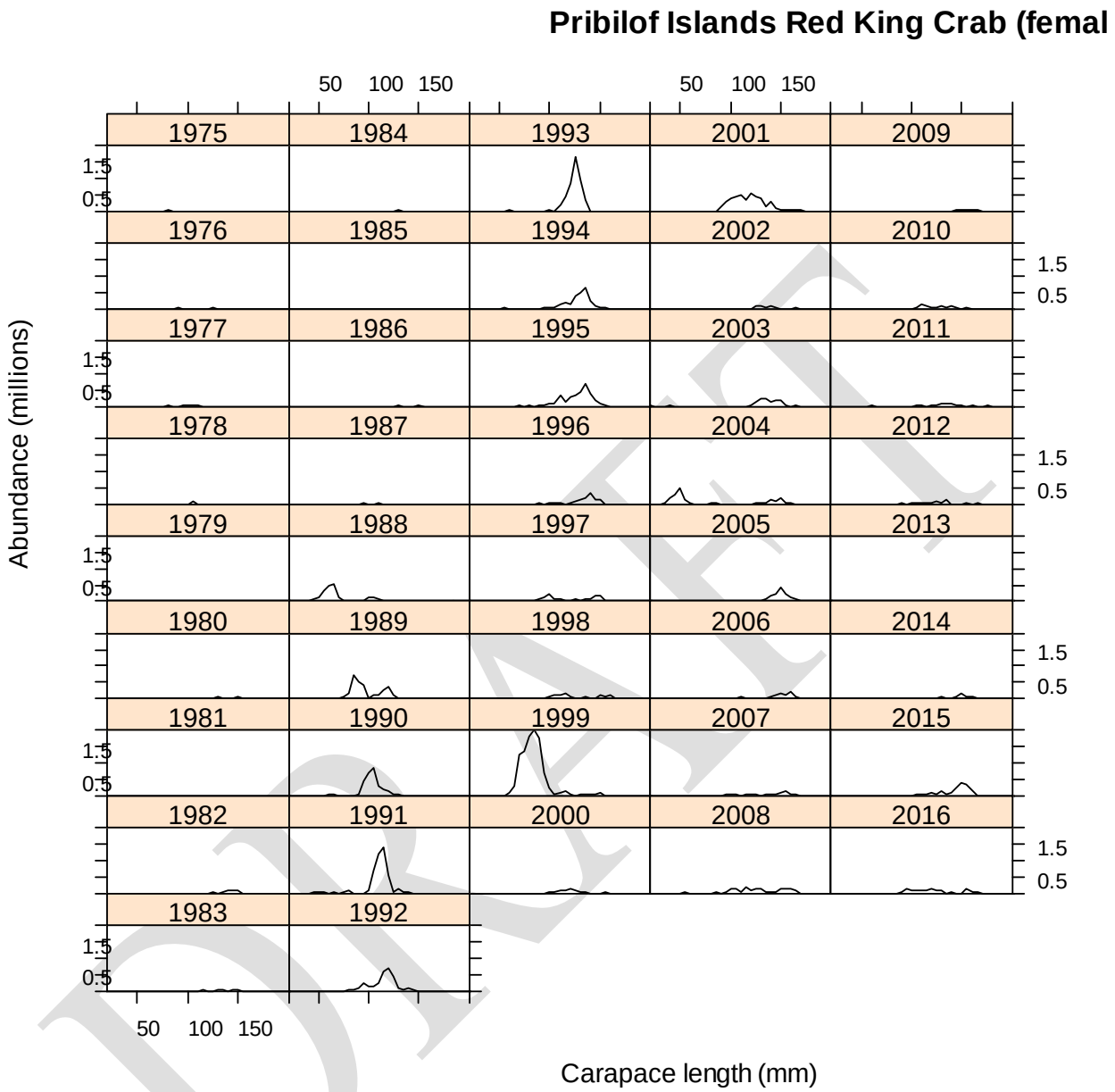

Figure 32. -- Size frequency by 5 mm length classes of Pribilof Islands female red king crab (*Paralithodes camtschaticus*) from 1975 to 2016.

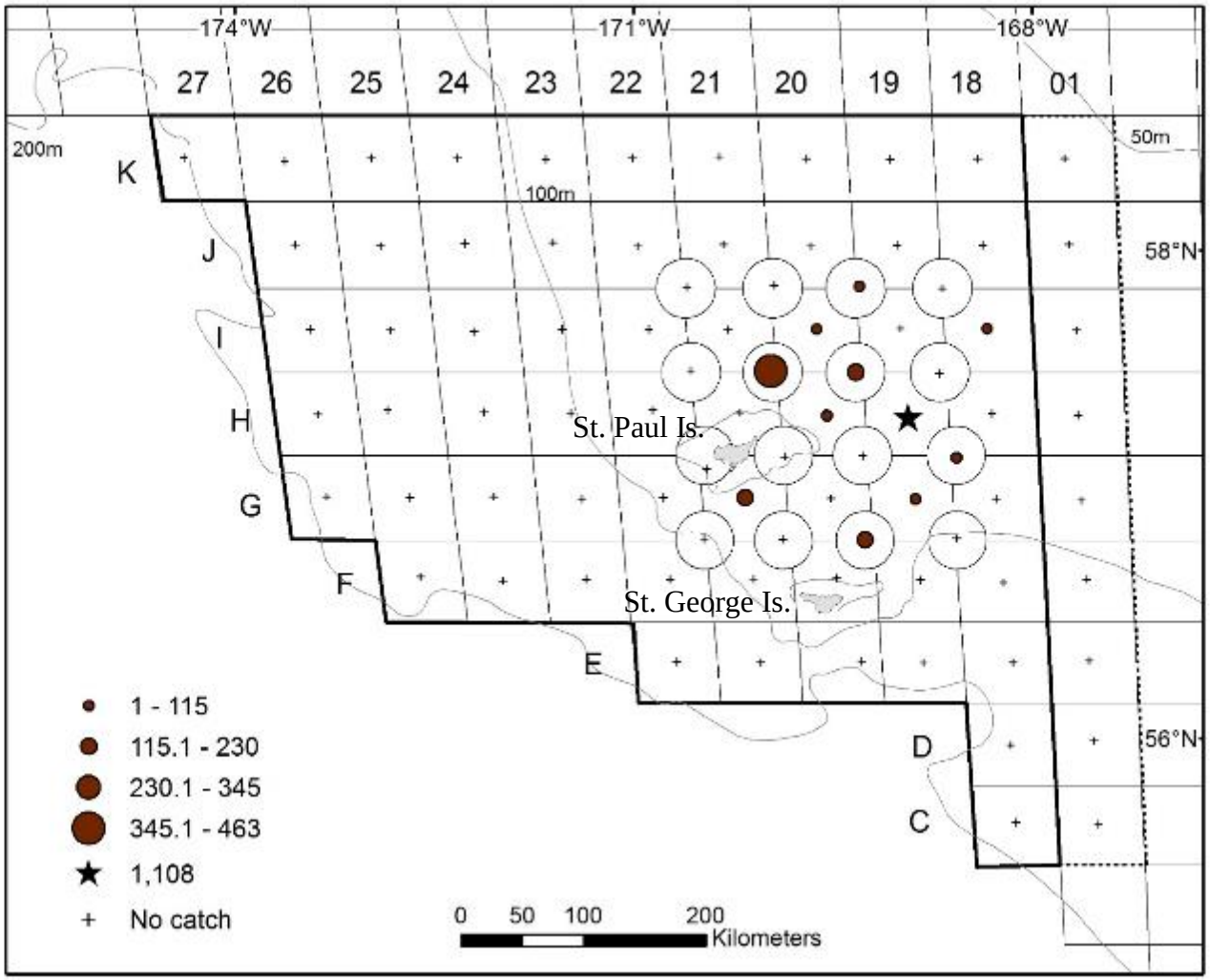

Figure 33. -- Total density (number nmi^{-2}) of blue king crab (*Paralithodes platypus*) at each station sampled in the Pribilof District in 2016. Data depicted by circles are equal interval densities, while stars represent densities larger than the standard scale. The outlined area depicts the management district as defined by ADF&G, while the dashed line depicts the modified eastern boundary as defined in the 2013 Rebuilding Plan (additional 9 stations).

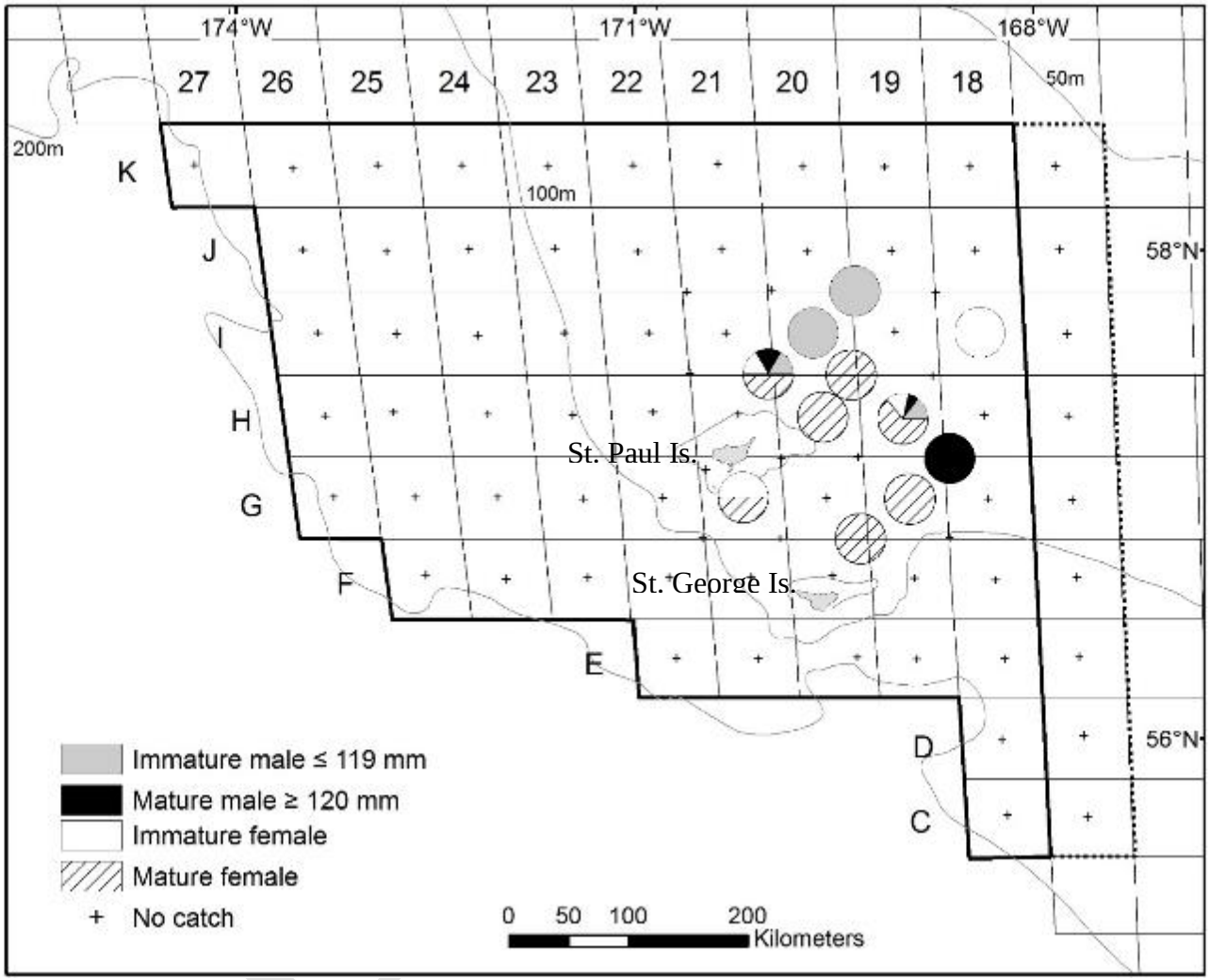

Figure 34. -- Percentage of male and female blue king crab (*Paralithodes platypus*) maturity categories at each station of the Pribilof District in 2016. The outlined area depicts the management district as defined by ADF&G, while the dashed line depicts the modified eastern boundary as defined in the 2013 Rebuilding Plan (additional 9 stations).

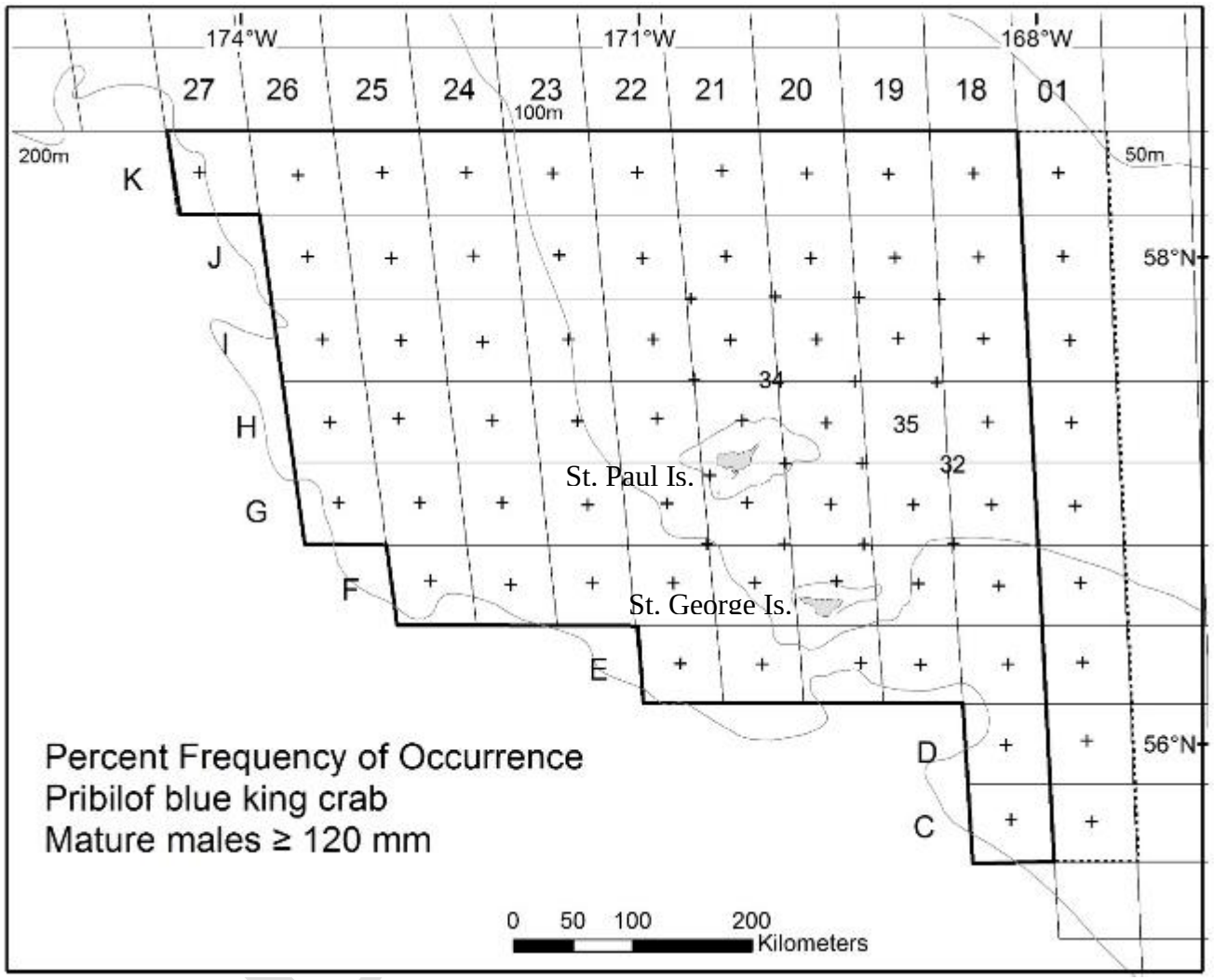

Figure 35. -- Percent frequency of occurrence of mature male blue king crab (*Paralithodes platypus)* at Pribilof District stations sampled in 2016. The outlined area depicts the management district as defined by ADF&G, while the dashed line depicts the modified eastern boundary as defined in the 2013 Rebuilding Plan (additional 9 stations).

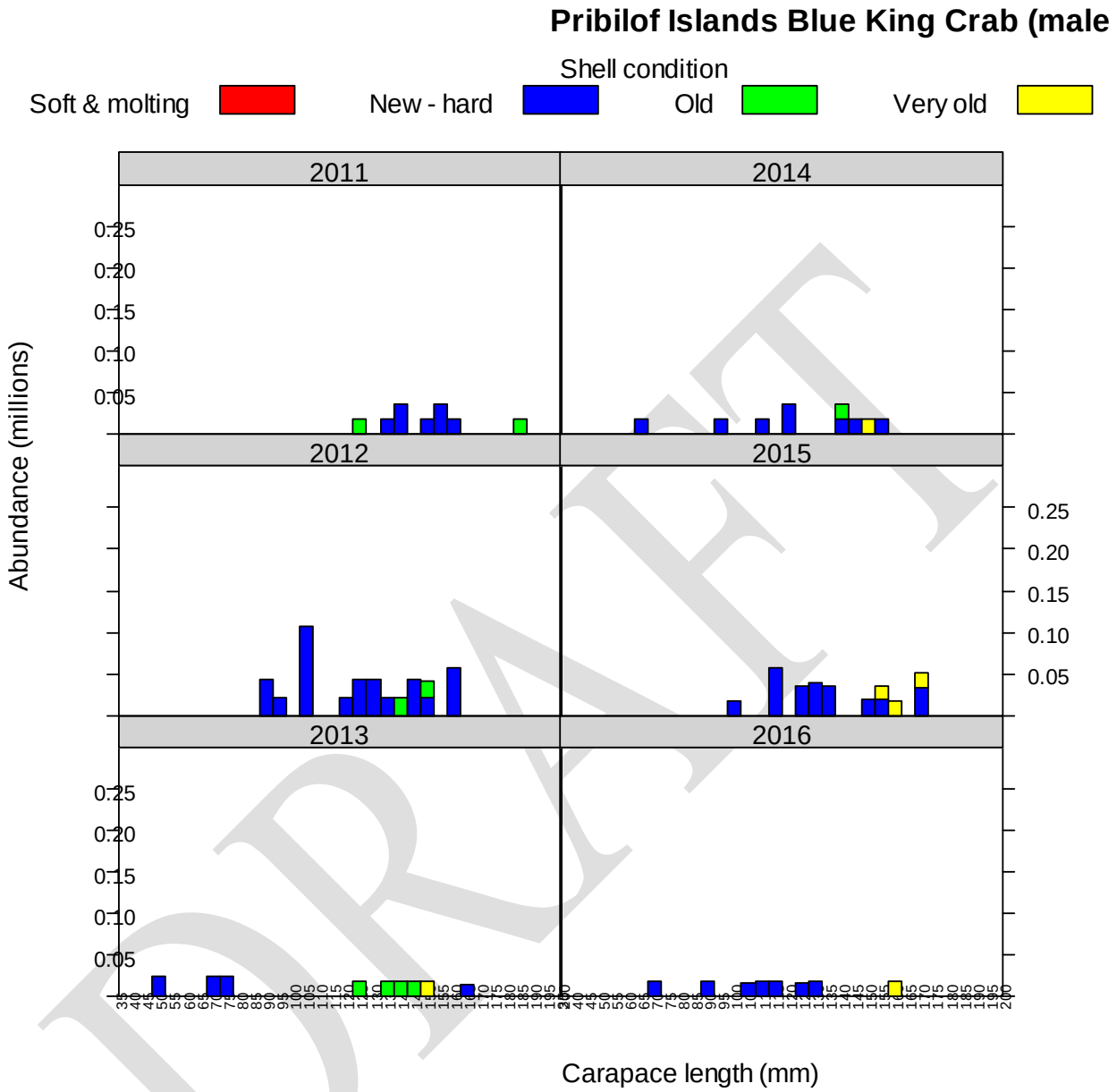

Figure 36. -- Size frequency by shell condition of Pribilof District male blue king crab (*Paralithodes platypus*) by 5 mm length classes, 2011-2016.

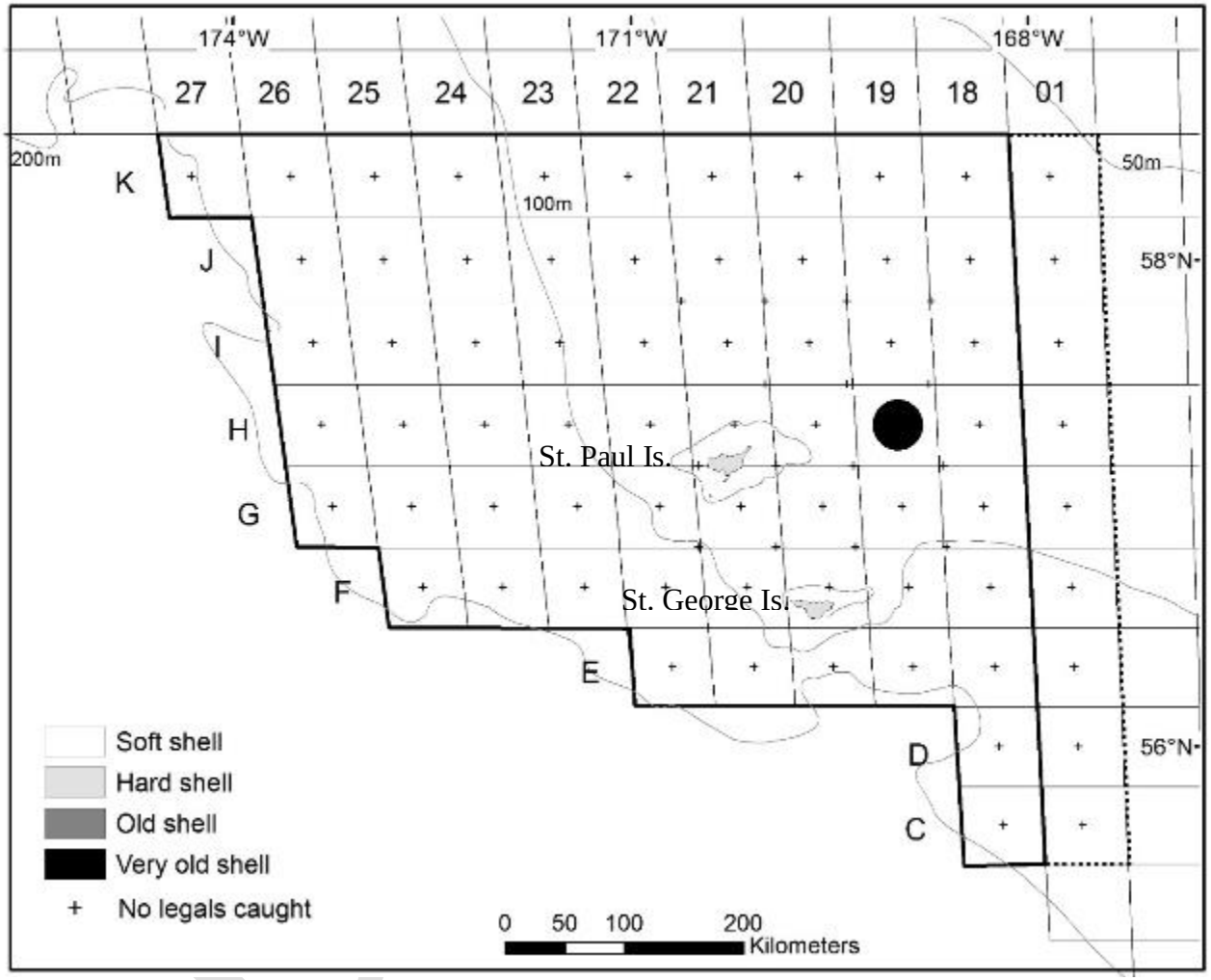

Figure 37. -- Distribution of legal-sized male blue king crab (*Paralithodes platypus*) caught at each station of the Pribilof District in 2016 distinguished by shell condition. The outlined area depicts the management district as defined by ADF&G, while the dashed line depicts the modified eastern boundary as defined in the 2013 Rebuilding Plan (additional 9 stations).

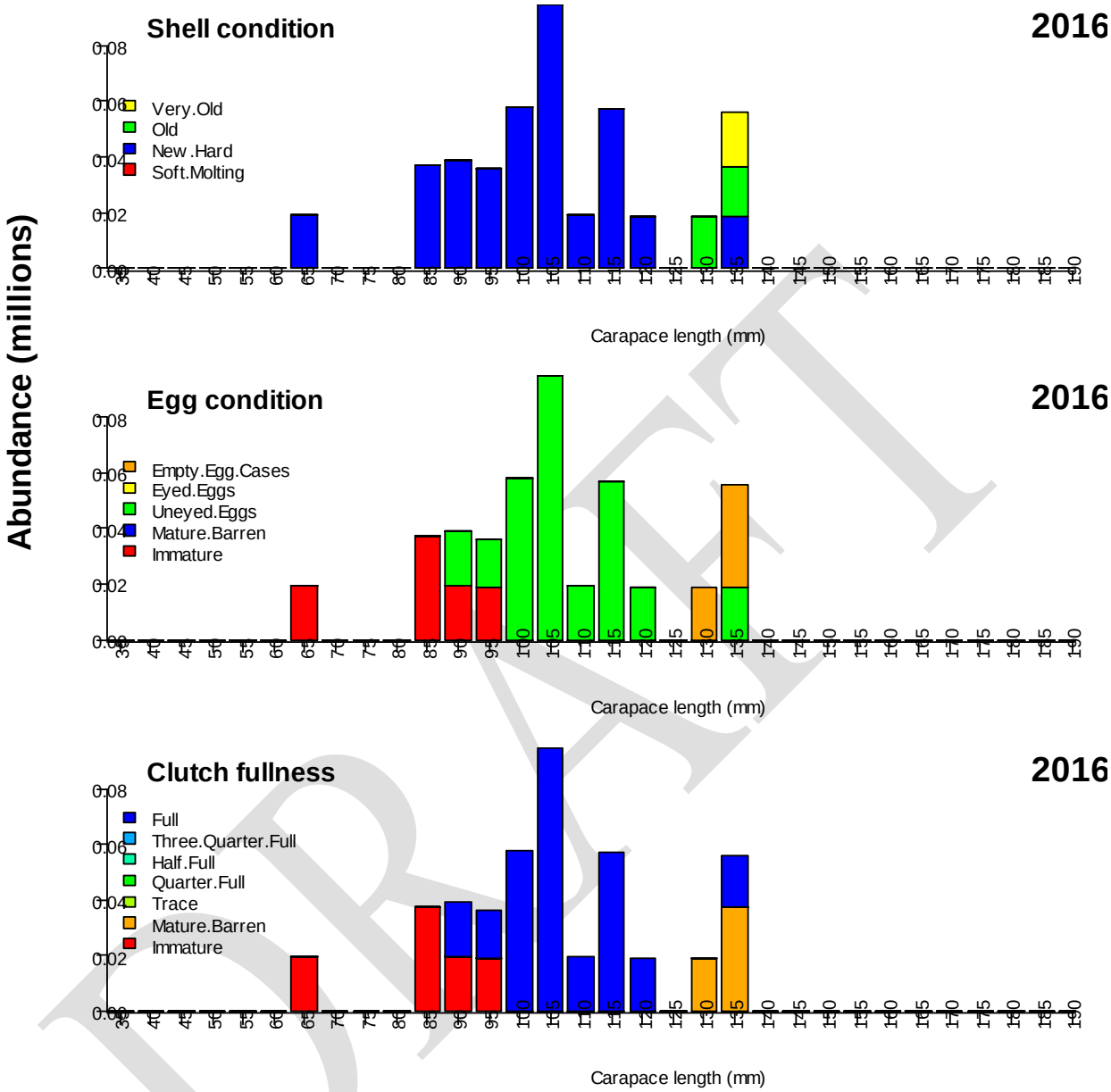

Figure 38. -- Size frequency by shell condition, egg condition, and clutch fullness of Pribilof District female blue king crab (*Paralithodes platypus*) by 5 mm length classes in 2016.

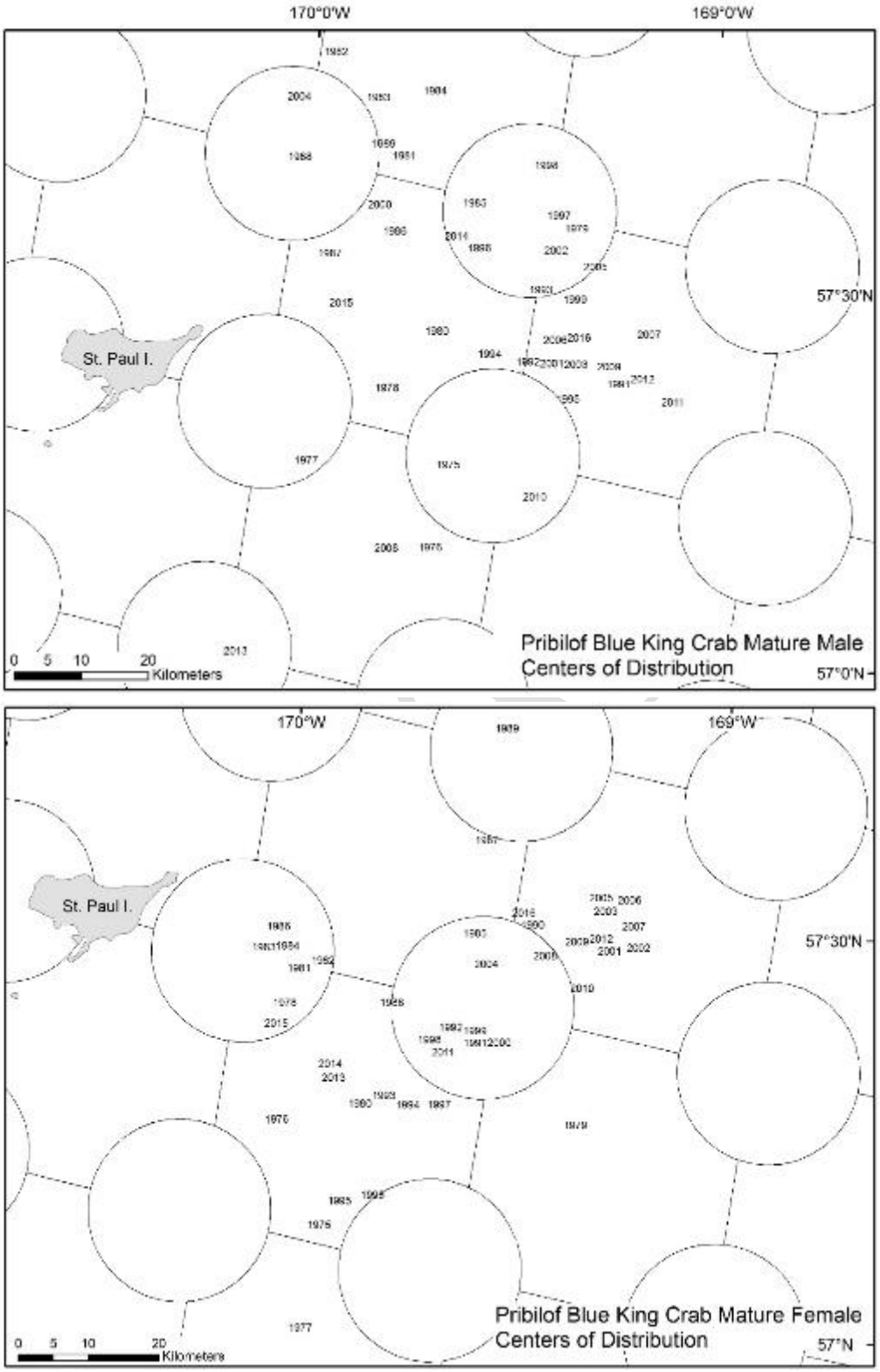

Figure 39. -- Centers of stock distribution of Pribilof Islands male and female blue king crab (*Paralithodes platypus*) from 1975 to 2016.

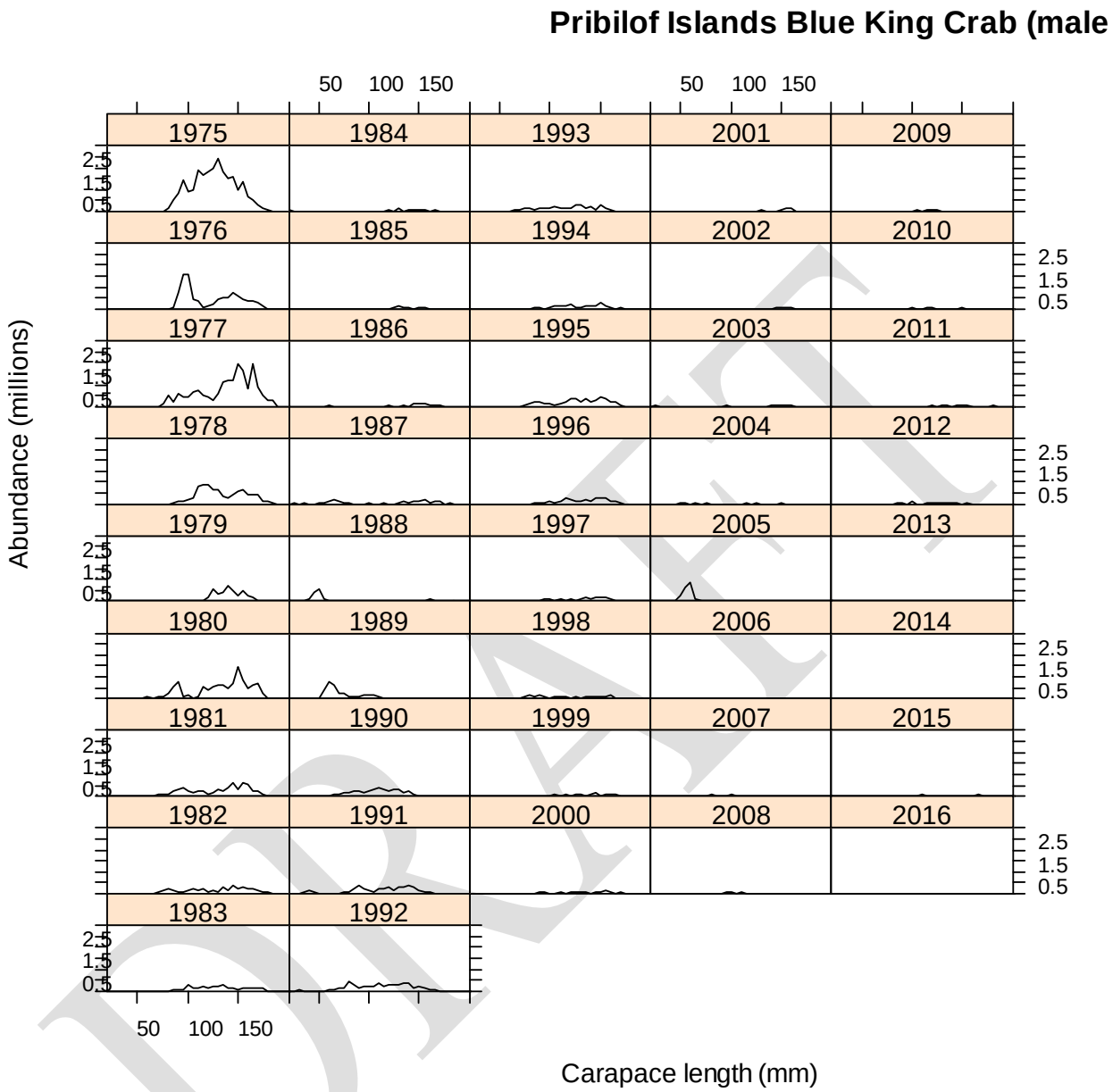

Figure 40. -- Size frequency by 5 mm length classes of Pribilof Islands male blue king crab (*Paralithodes platypus*) from 1975 to 2016.

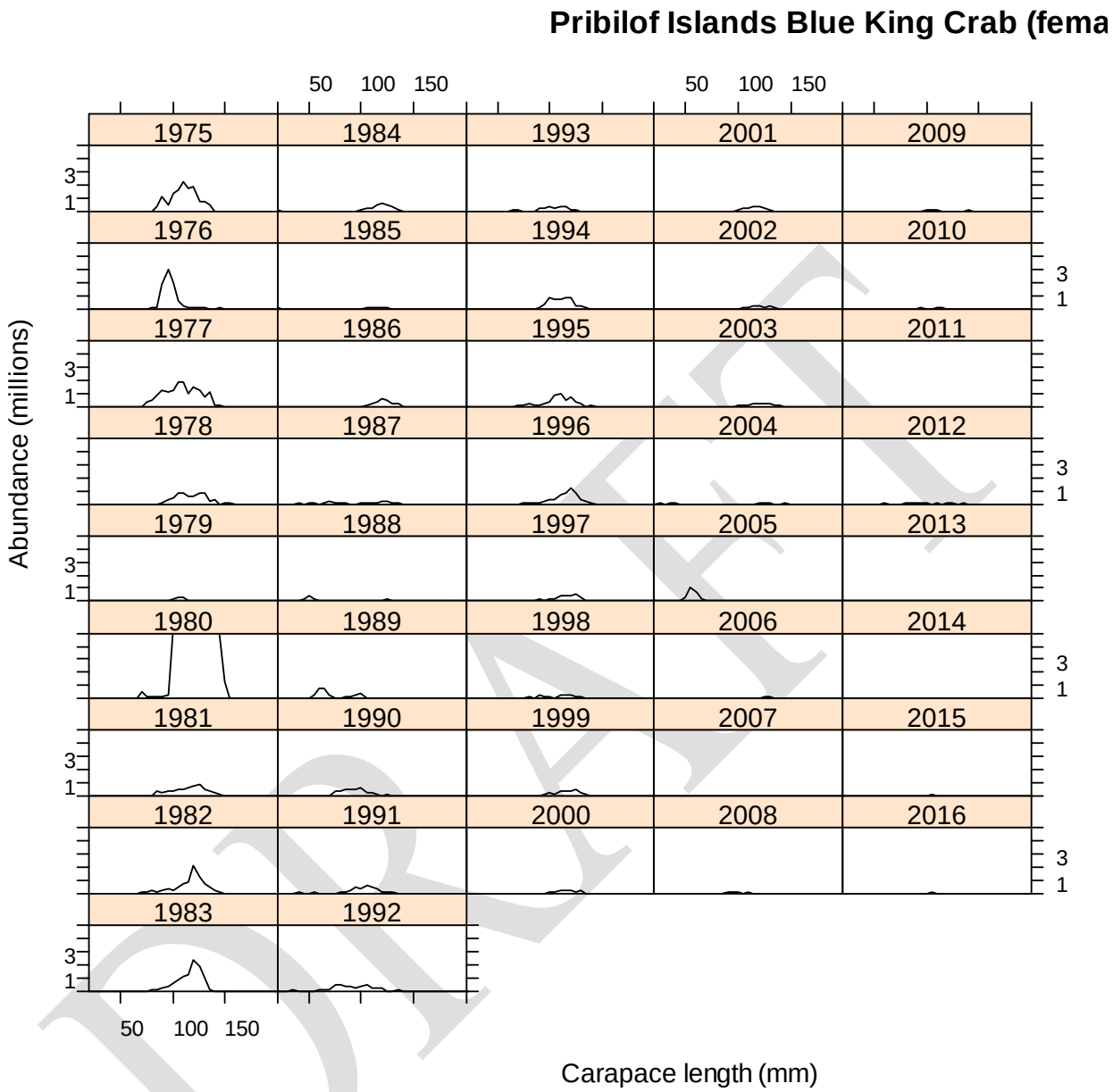

Figure 41. -- Size frequency by 5 mm length classes of Pribilof Islands female blue king crab (*Paralithodes platypus*) from 1975 to 2016.

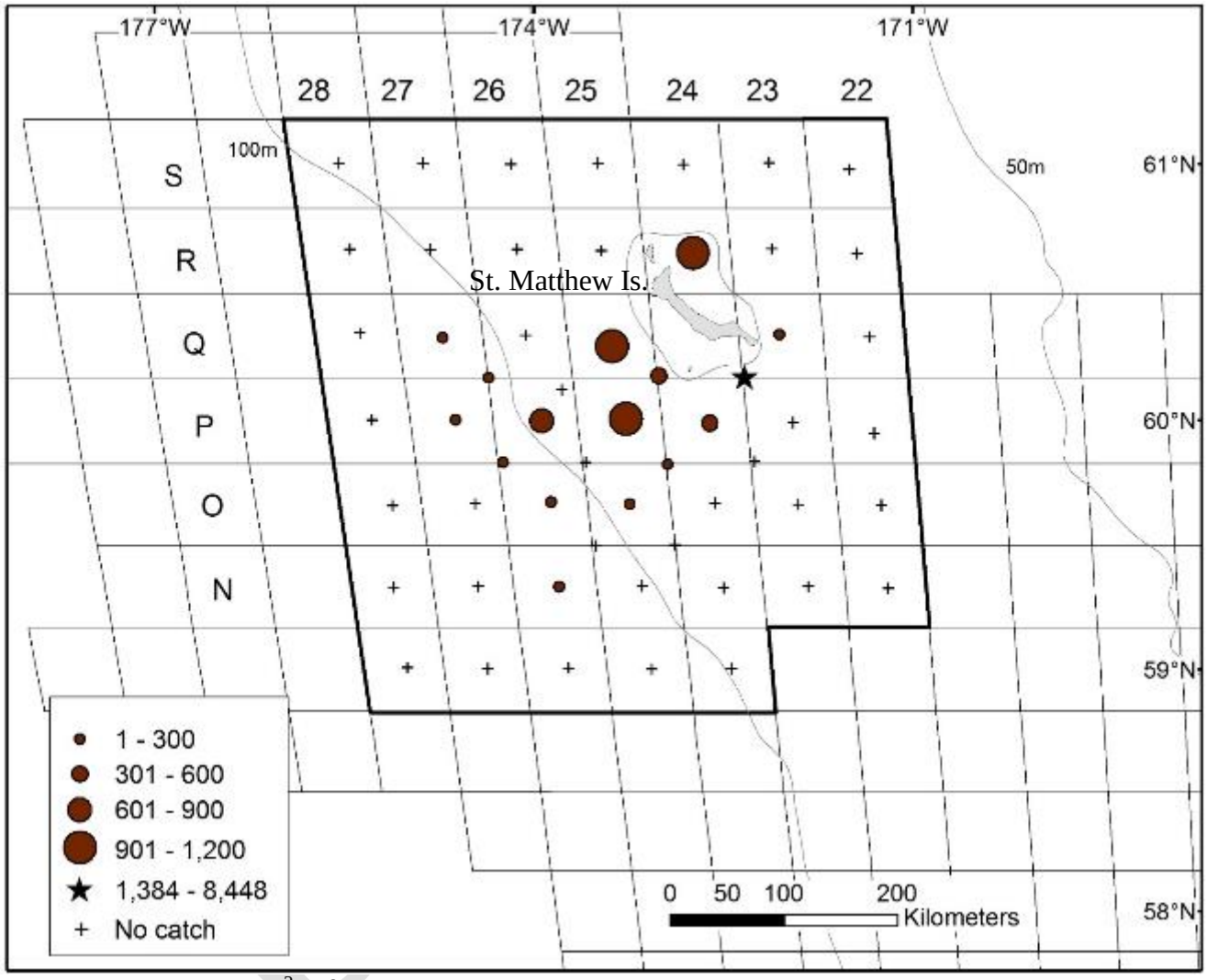

Figure 42. -- Total density (number nmi^{-2}) of blue king crab (*Paralithodes platypus*) at each station sampled in the St. Matthew Island Section of the Northern District in 2016. Data depicted by circles are equal interval densities, while stars are densities larger than the standard scale. The outlined area depicts stations within the St. Matthew Island Section sampling strata.

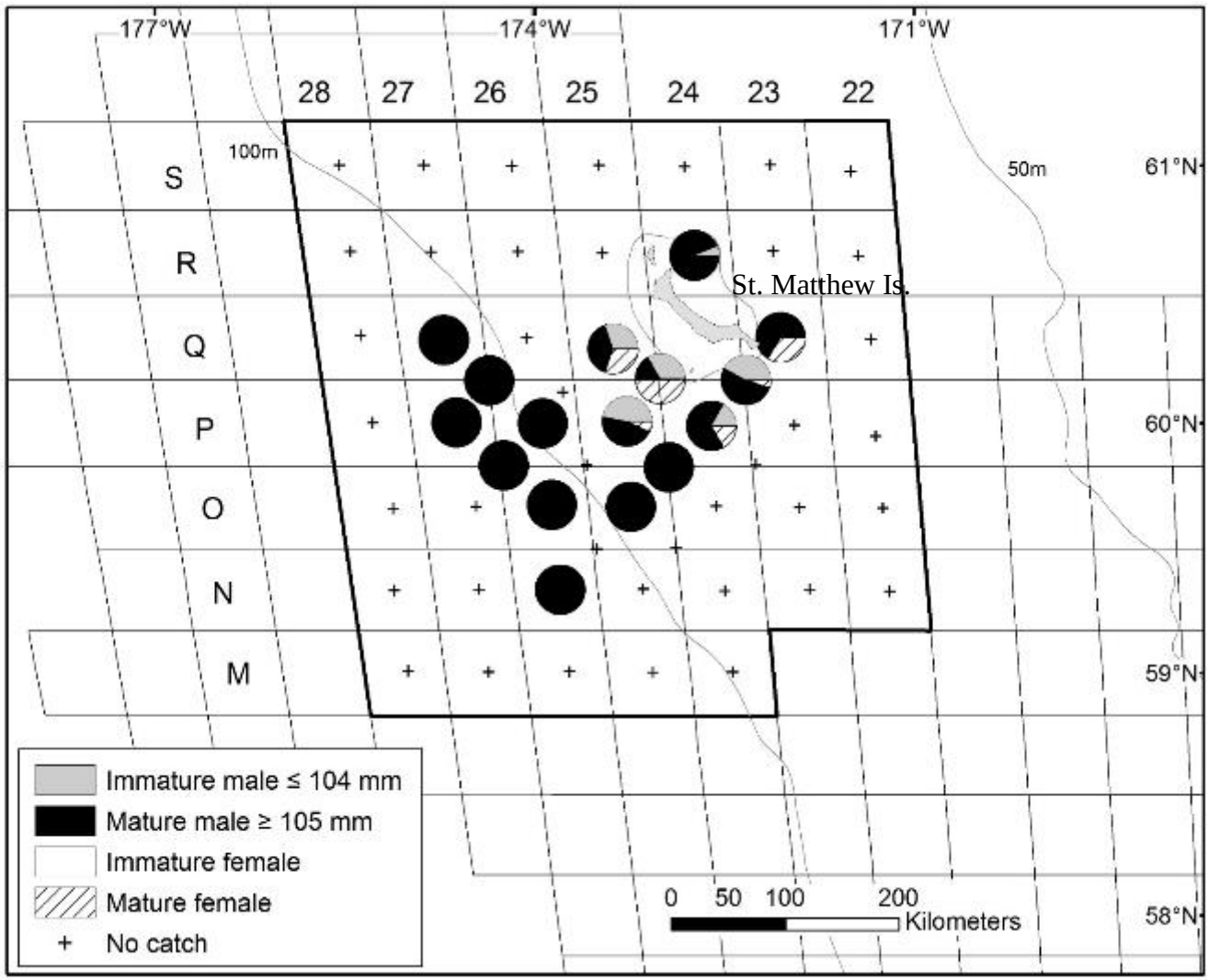

Figure 43. -- Percentage of male and female blue king crab (*Paralithodes platypus*) maturity categories at each station of the St. Matthew Island Section of the Northern District in 2016. The outlined area depicts stations within the St. Matthew Island Section sampling strata.

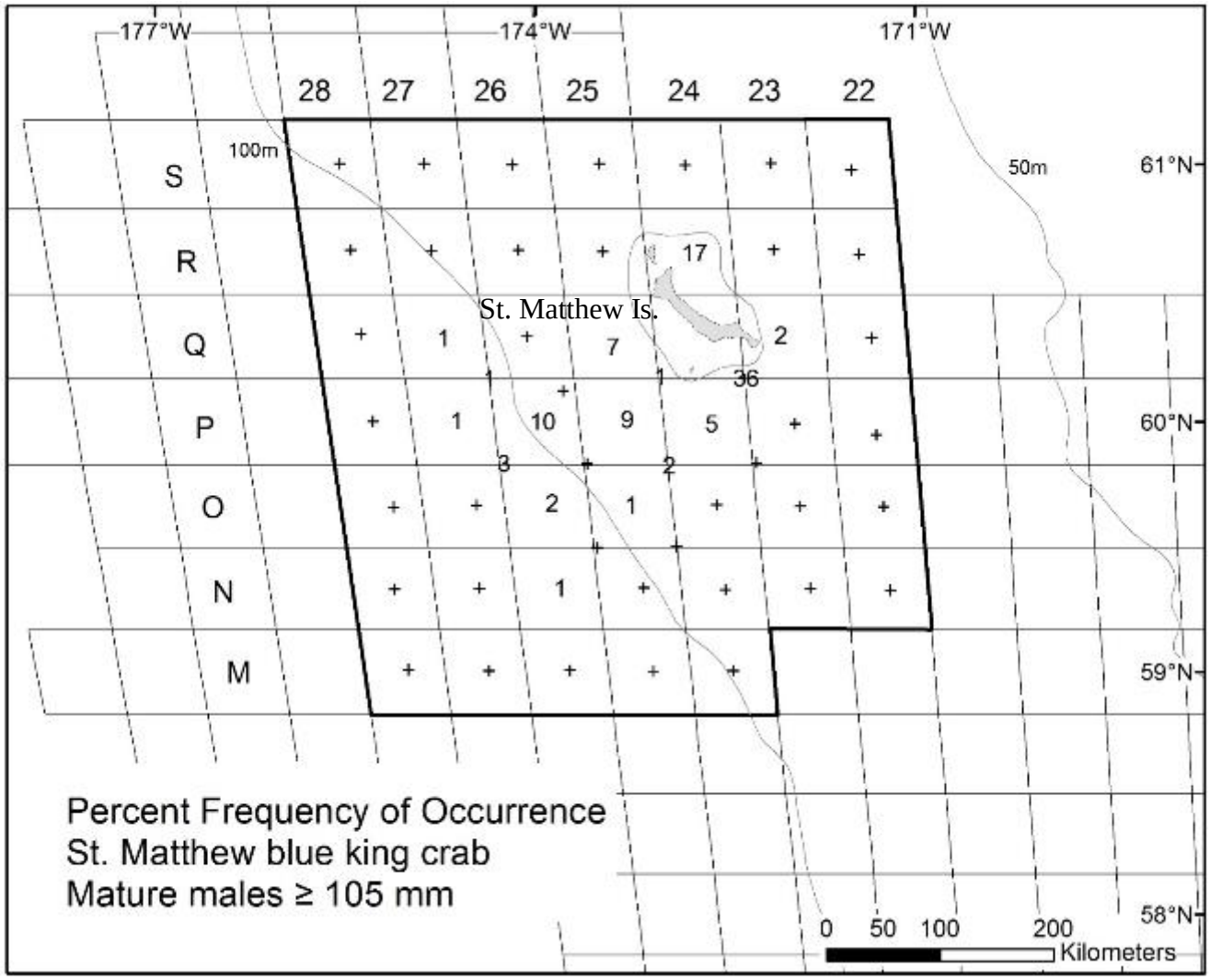

Figure 44. -- Percent frequency of occurrence of mature male blue king crab (*Paralithodes platypus)* at stations in the 2016 St. Matthew Island Section sampling strata of the Northern District.

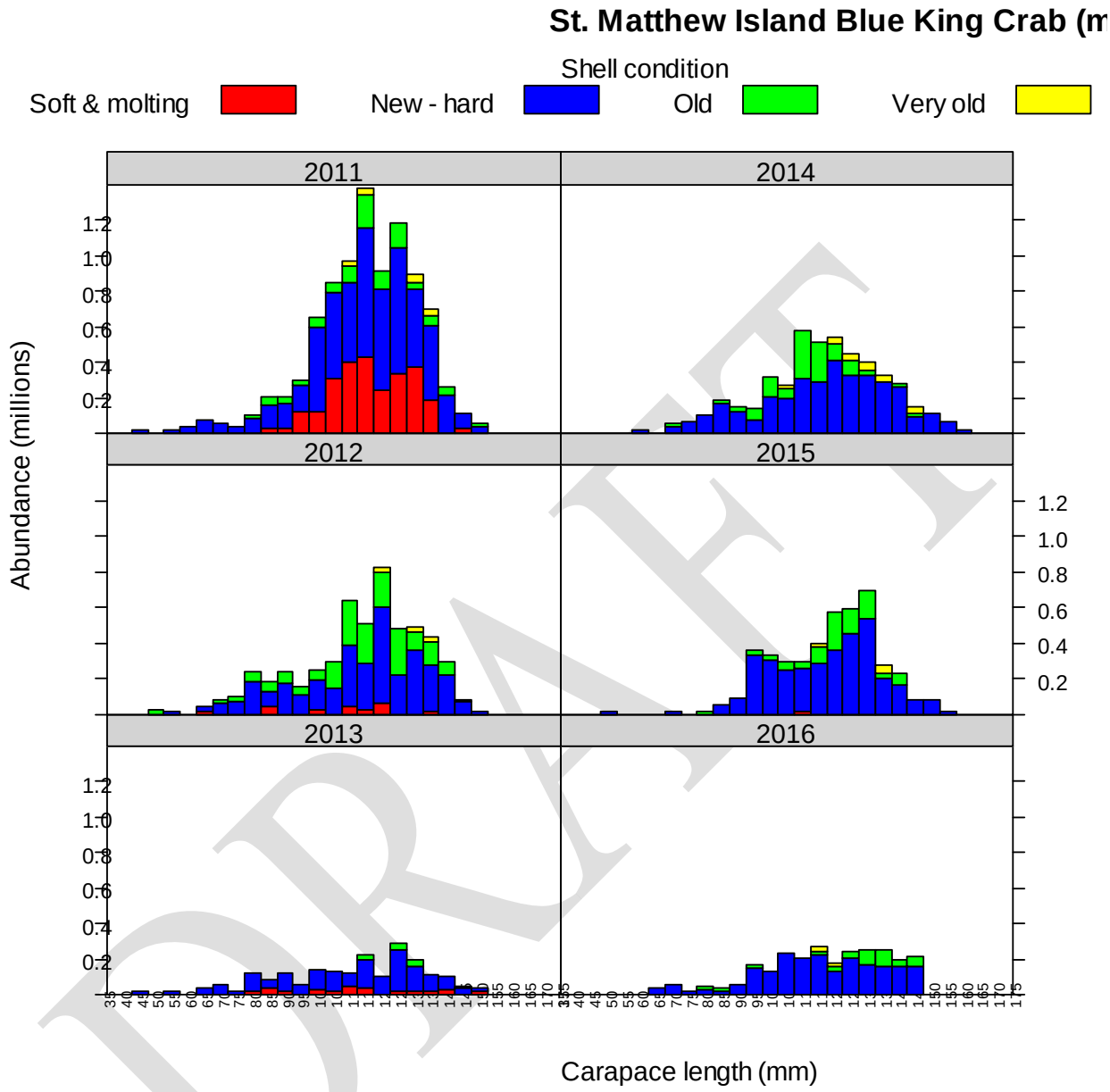

Figure 45. -- Size frequency by shell condition of St. Matthew Island Section male blue king crab (*Paralithodes platypus*) by 5 mm length classes, 2011-2016.

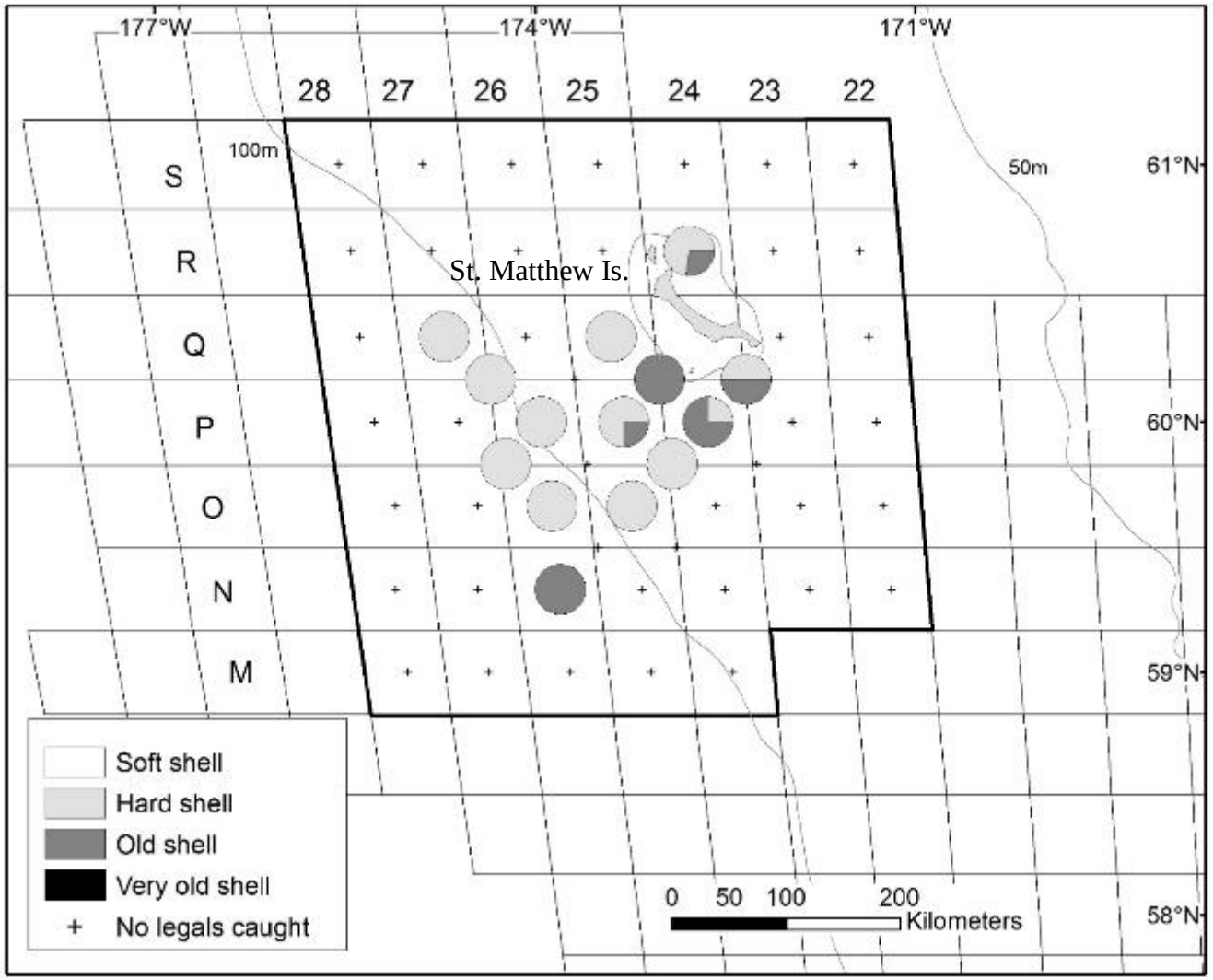

Figure 46. -- Distribution of legal-sized male blue king crab (*Paralithodes platypus*) caught at each station of the St. Matthew Island Section of the Northern District in 2016 and distinguished by shell condition. The outlined area depicts stations within the St. Matthew Island Section sampling strata.

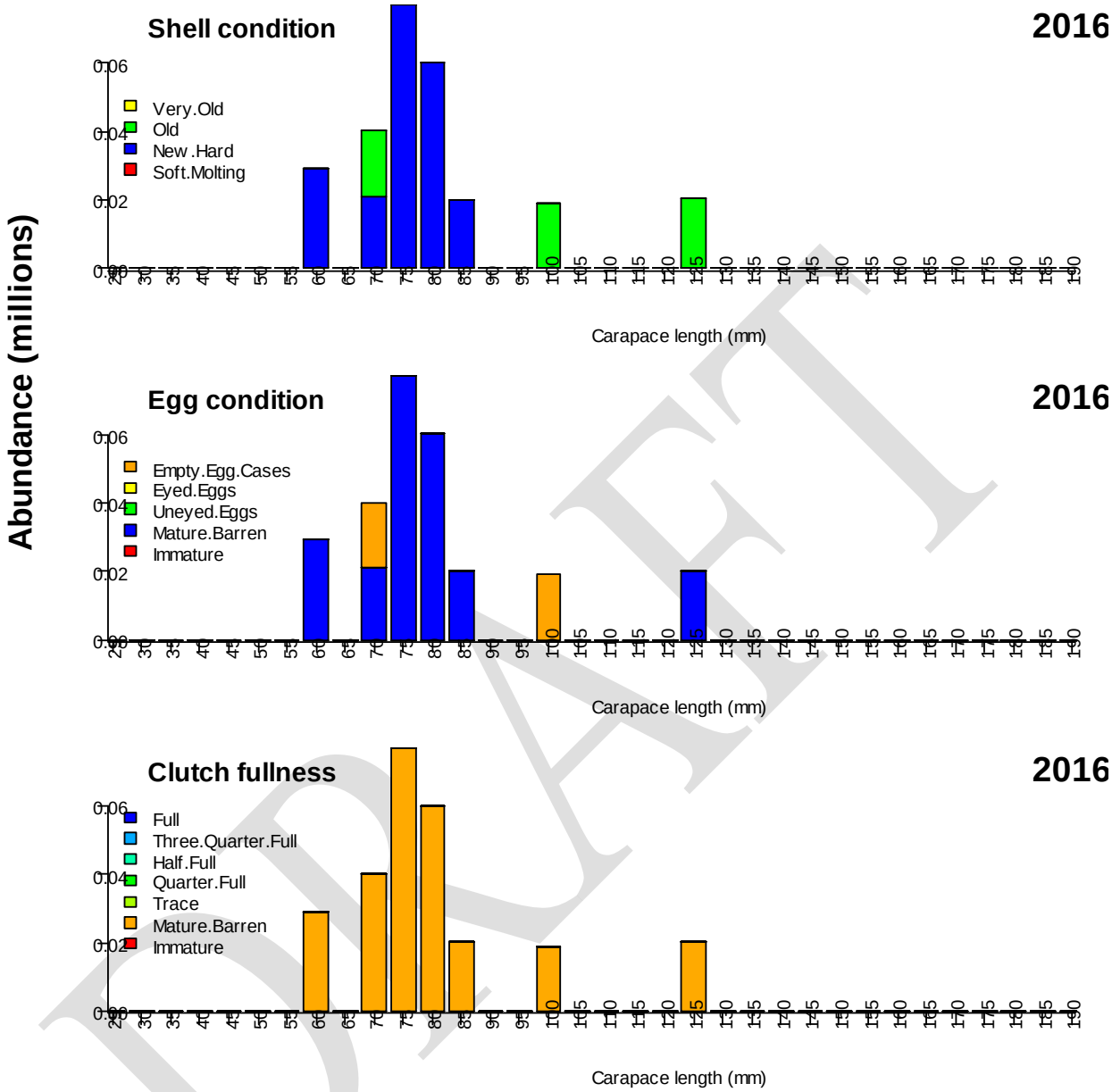

Figure 47. -- Size frequency by shell condition, egg condition, and clutch size of St. Matthew Island Section female blue king crab (*Paralithodes platypus*) by 5 mm length classes in 2016.

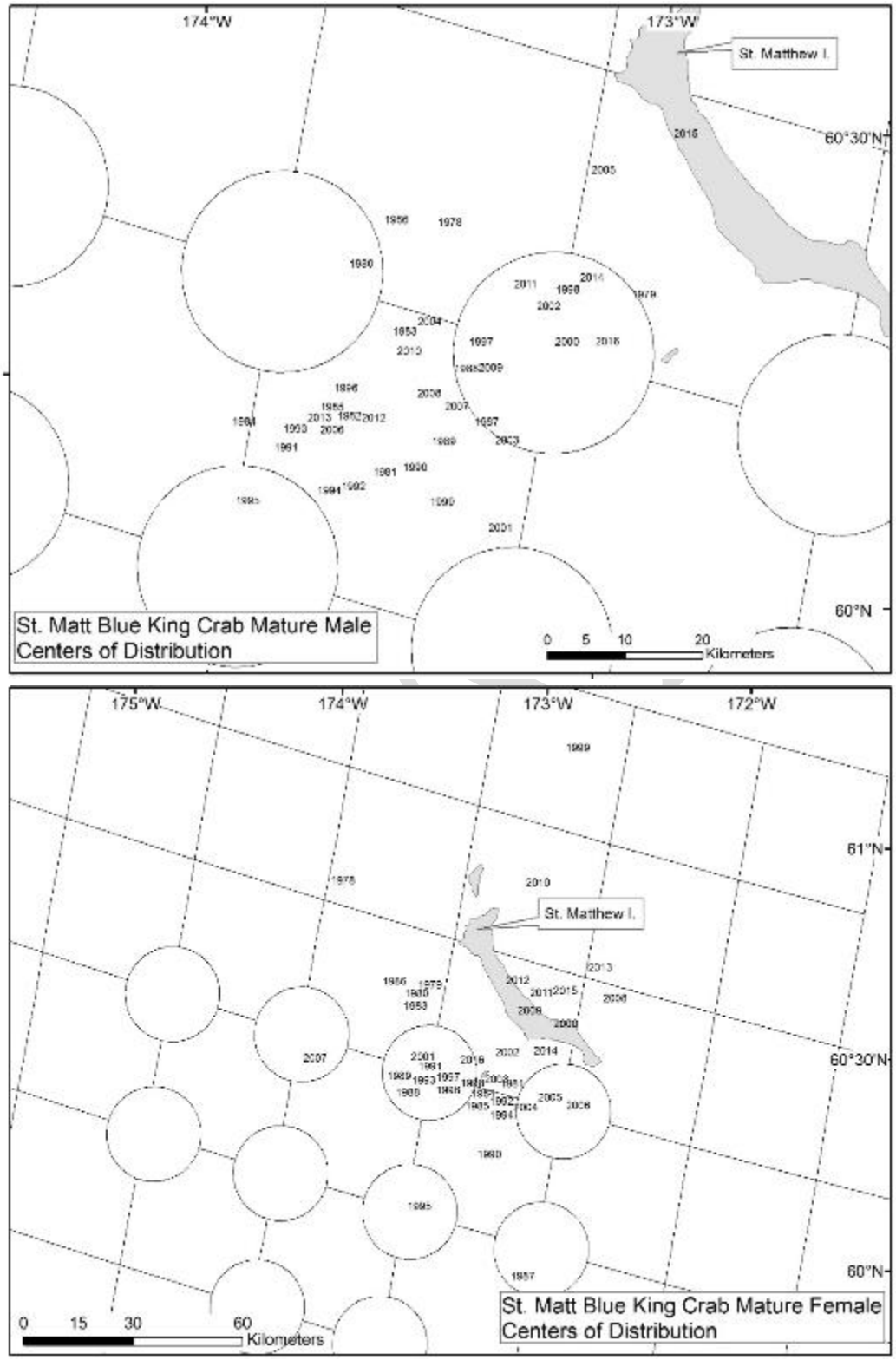

Figure 48. -- Centers of stock distribution of St. Matthew Island male and female blue king crab (*Paralithodes platypus*) from 1975 to 2016.

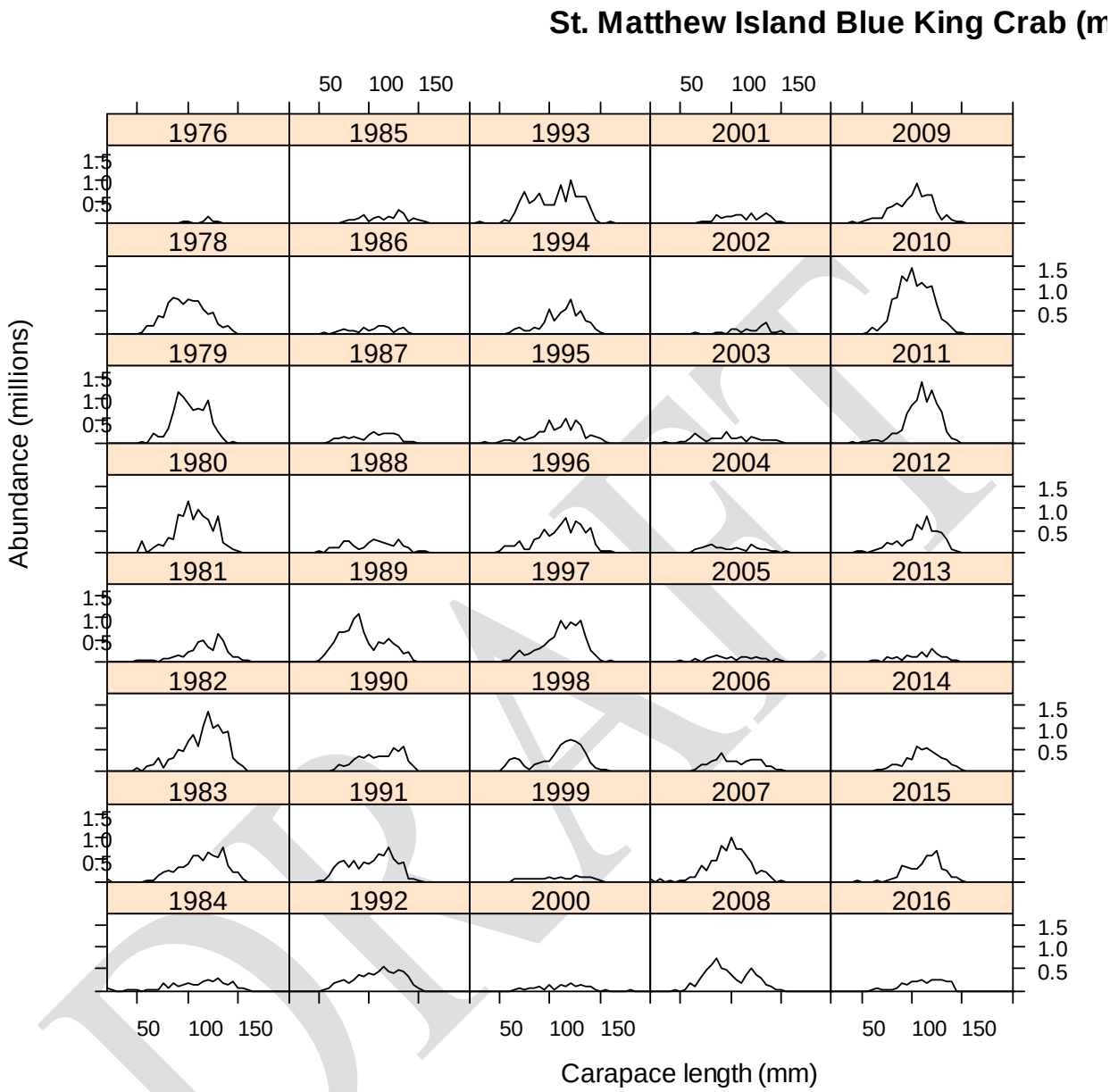

Figure 49. -- Size frequency by 5 mm length classes of St. Matthew Island Section male blue king crab (*Paralithodes platypus*) from 1976 to 2016.

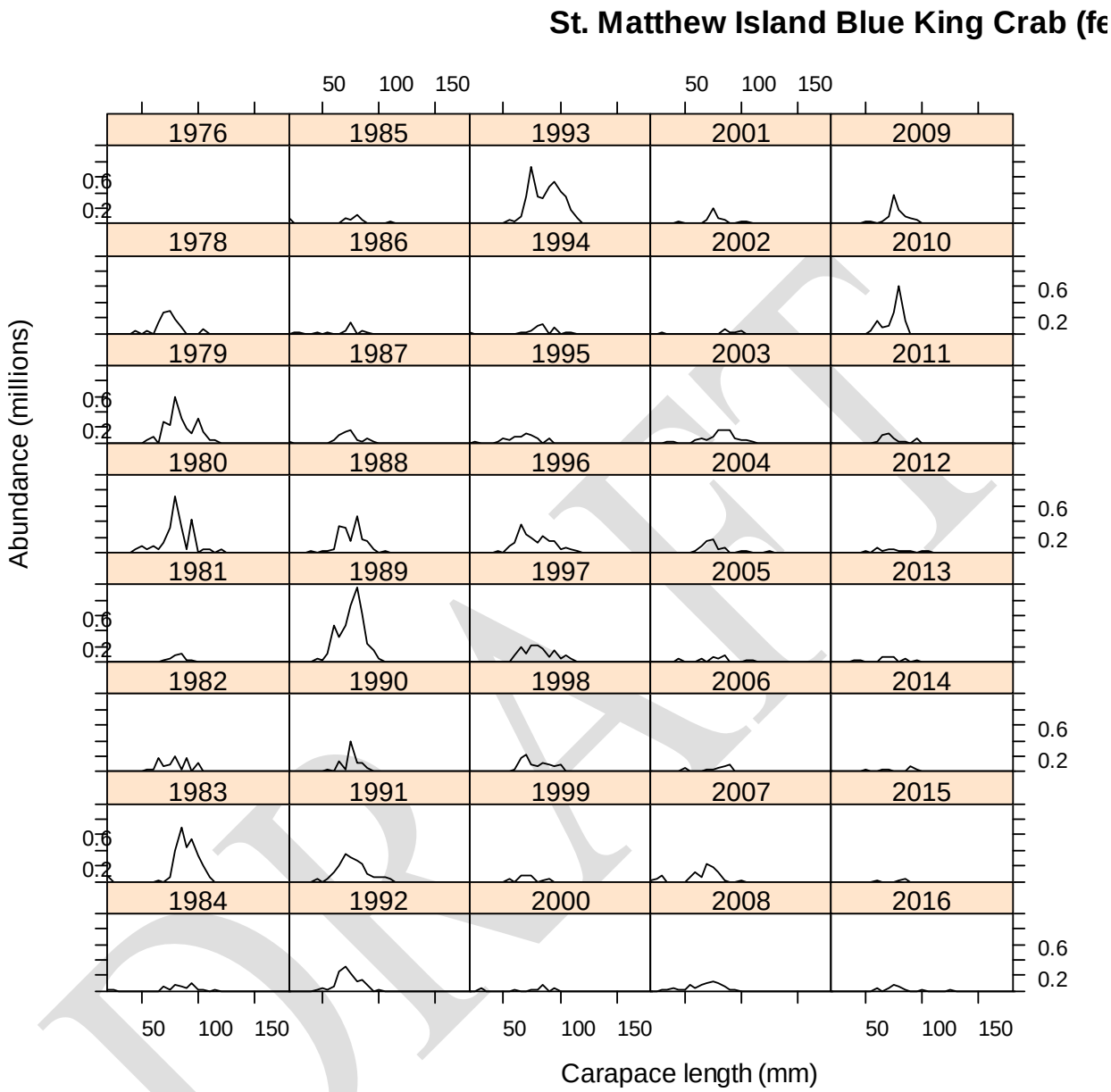

Figure 50. -- Size frequency by 5 mm length classes of St. Matthew Island Section female blue king crab (*Paralithodes platypus*) from 1976 to 2016.

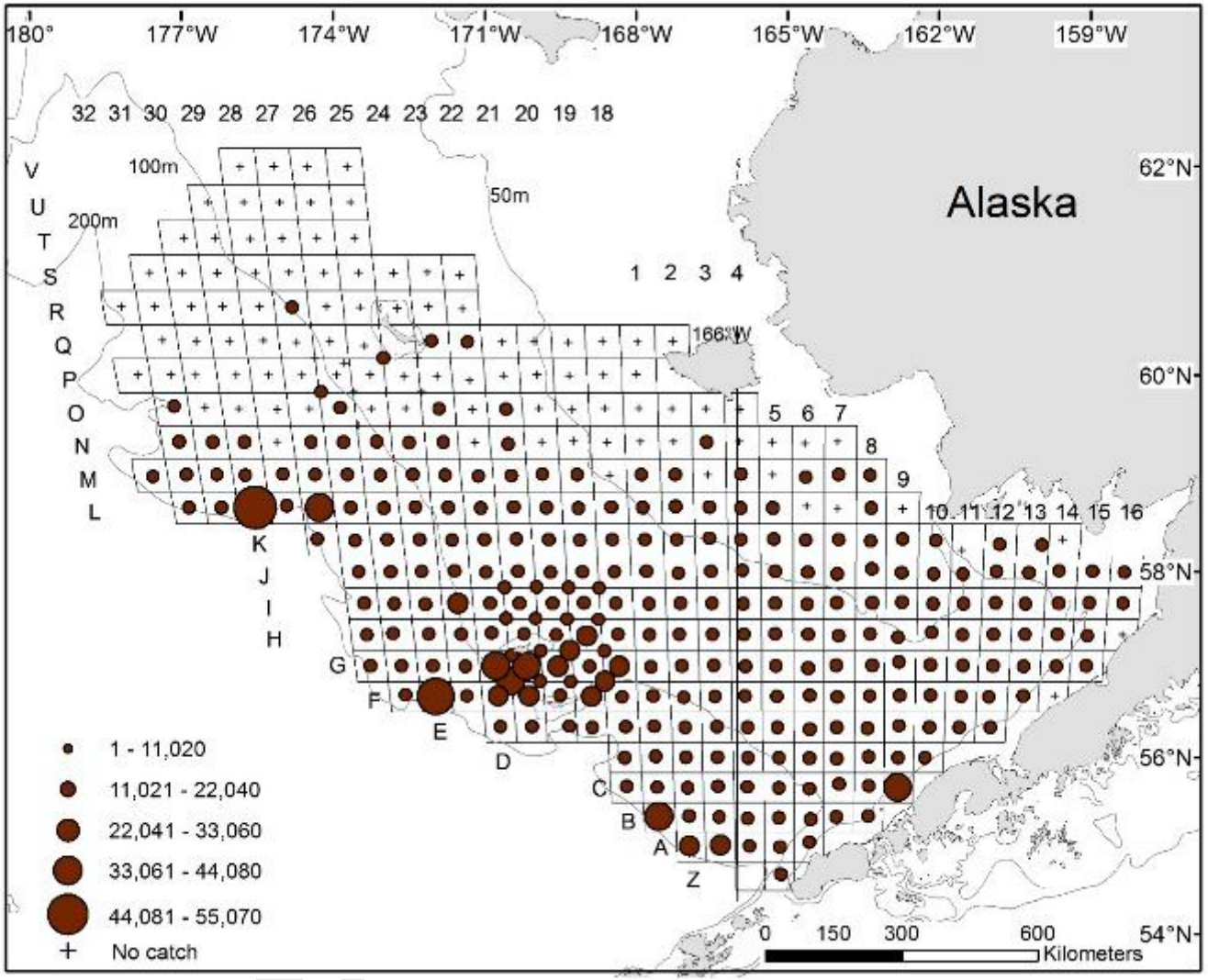

Figure 51. -- Total density (number nmi^{-2}) of Tanner crab (*Chionoecetes bairdi)* at each station sampled in 2016.

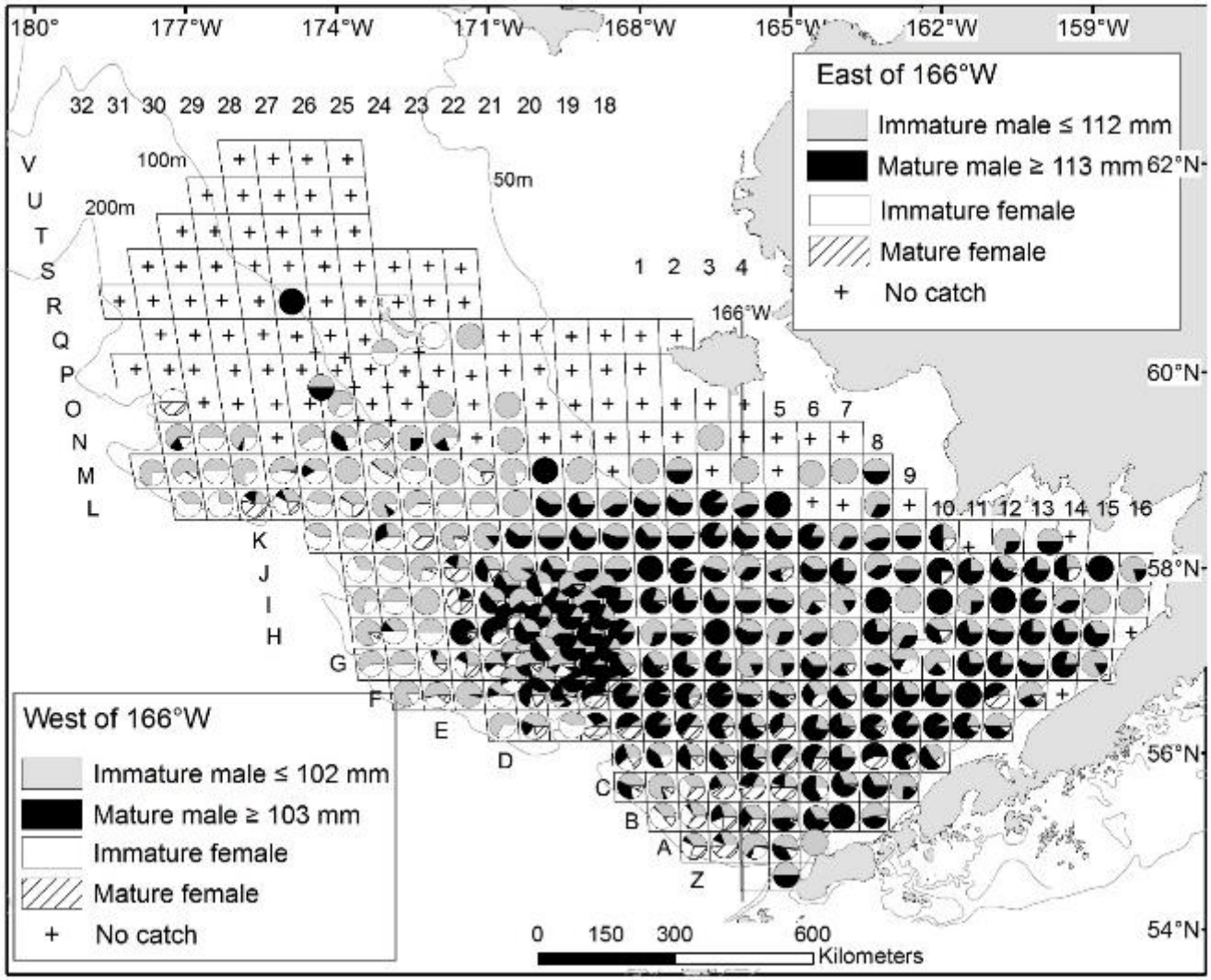

Figure 52. -- Percentage of male and female Tanner crab (*Chionoecetes bairdi*) maturity categories at each station sampled in 2016.

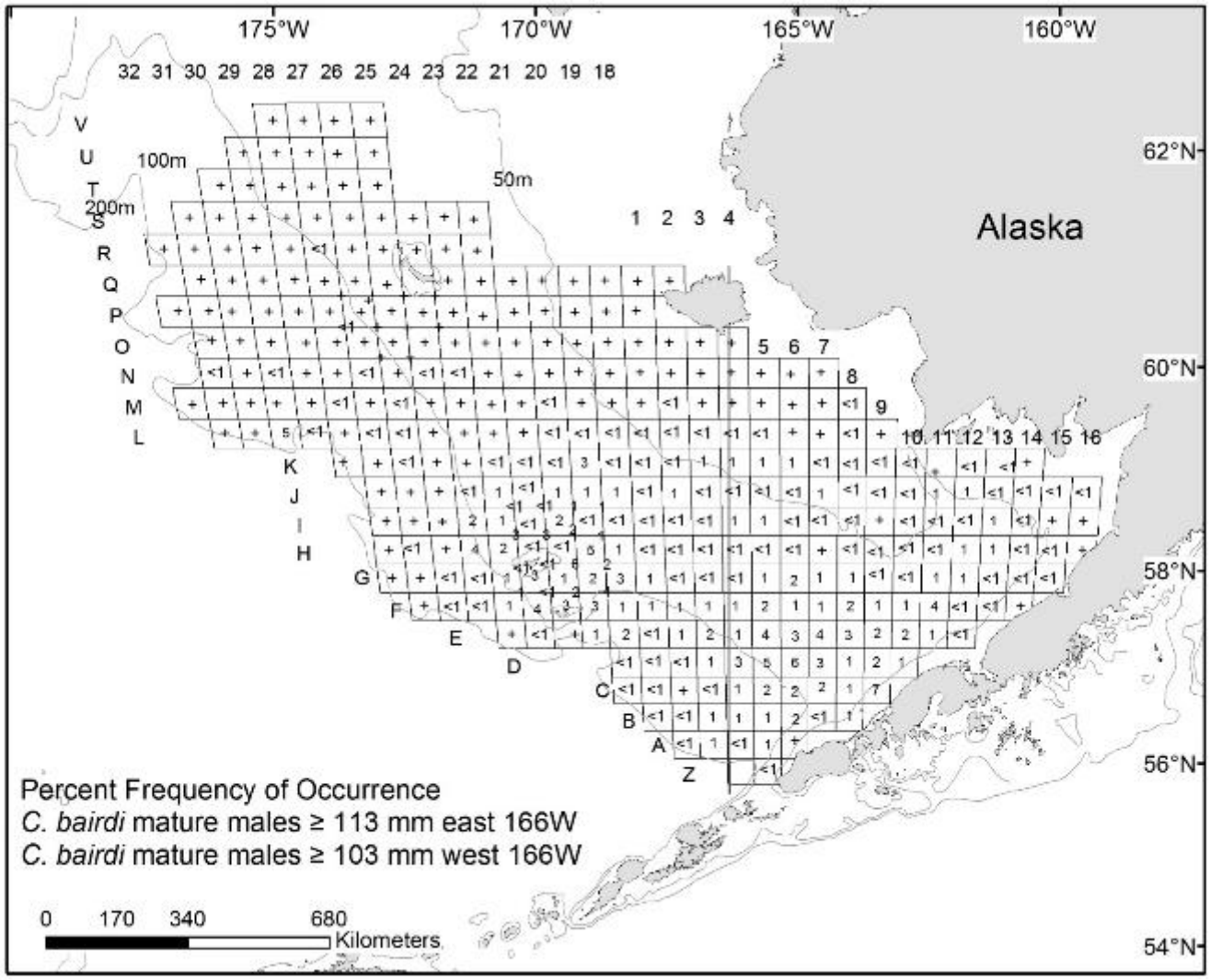

Figure 53. -- Percent frequency of occurrence of mature male Tanner crab (*Chionoecetes bairdi)* at stations sampled in the 2016.

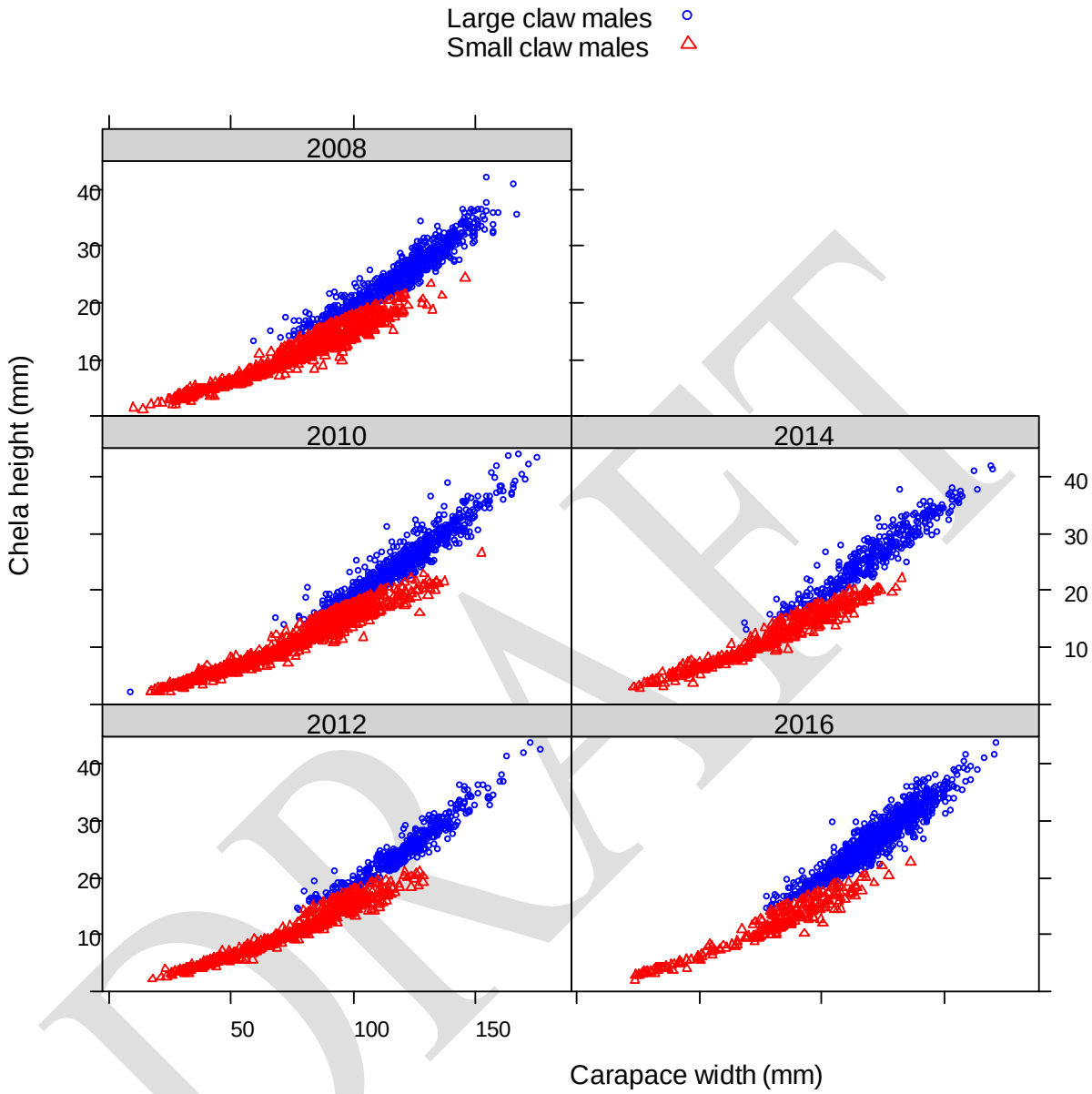

Figure 54. -- Male Tanner crab (*Chionoecetes bairdi*) chela height versus carapace width measurements collected on the 2008, 2010, 2012, 2014, and 2016 (all years combined, n = 6,822) National Marine Fisheries Service eastern Bering Sea bottom trawl surveys.

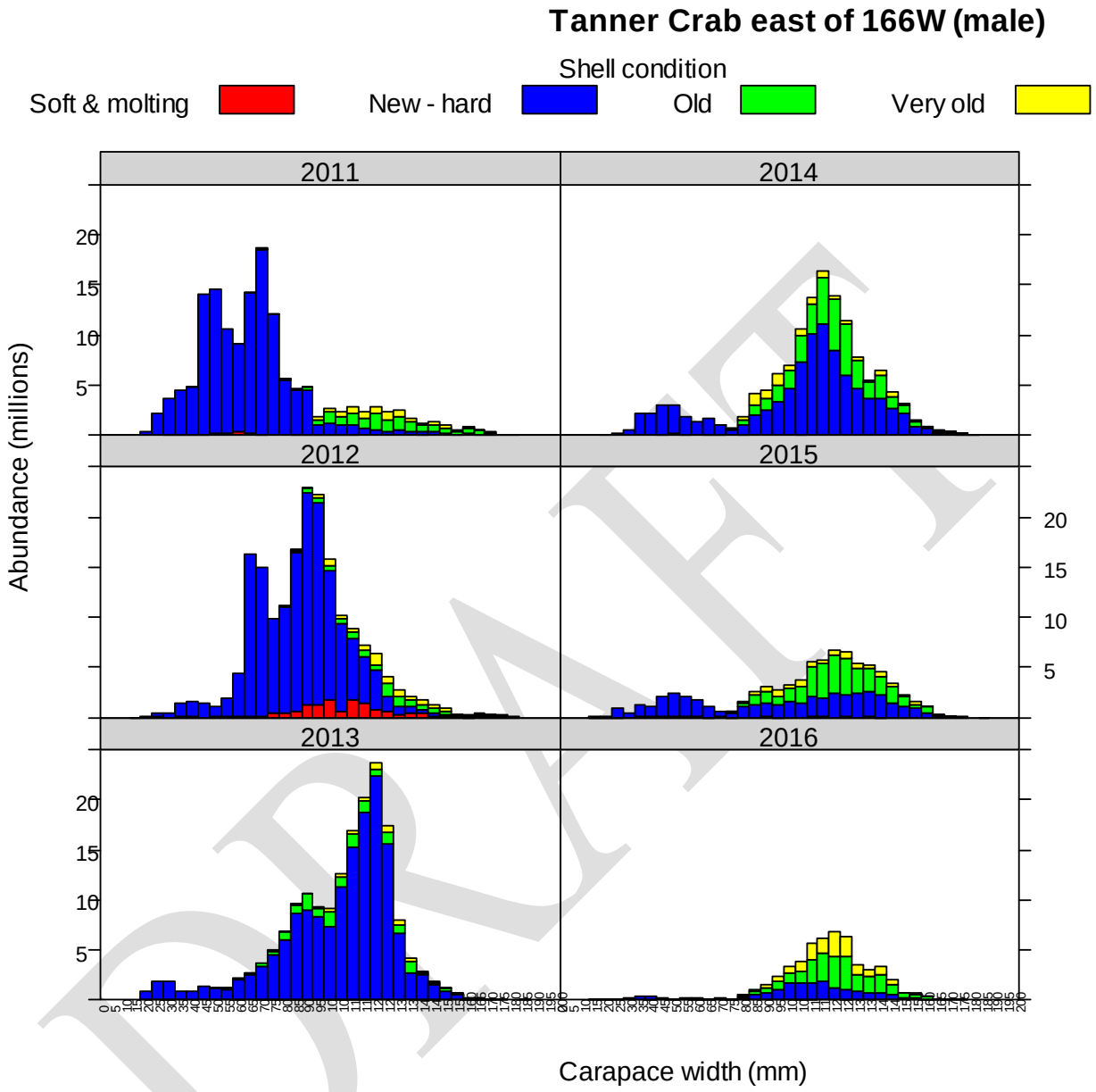

Figure 55. -- Size frequency by shell condition of male Tanner crab (*Chionoecetes bairdi*) east of 166° W by 5 mm width classes of all districts combined, 2011-2016.

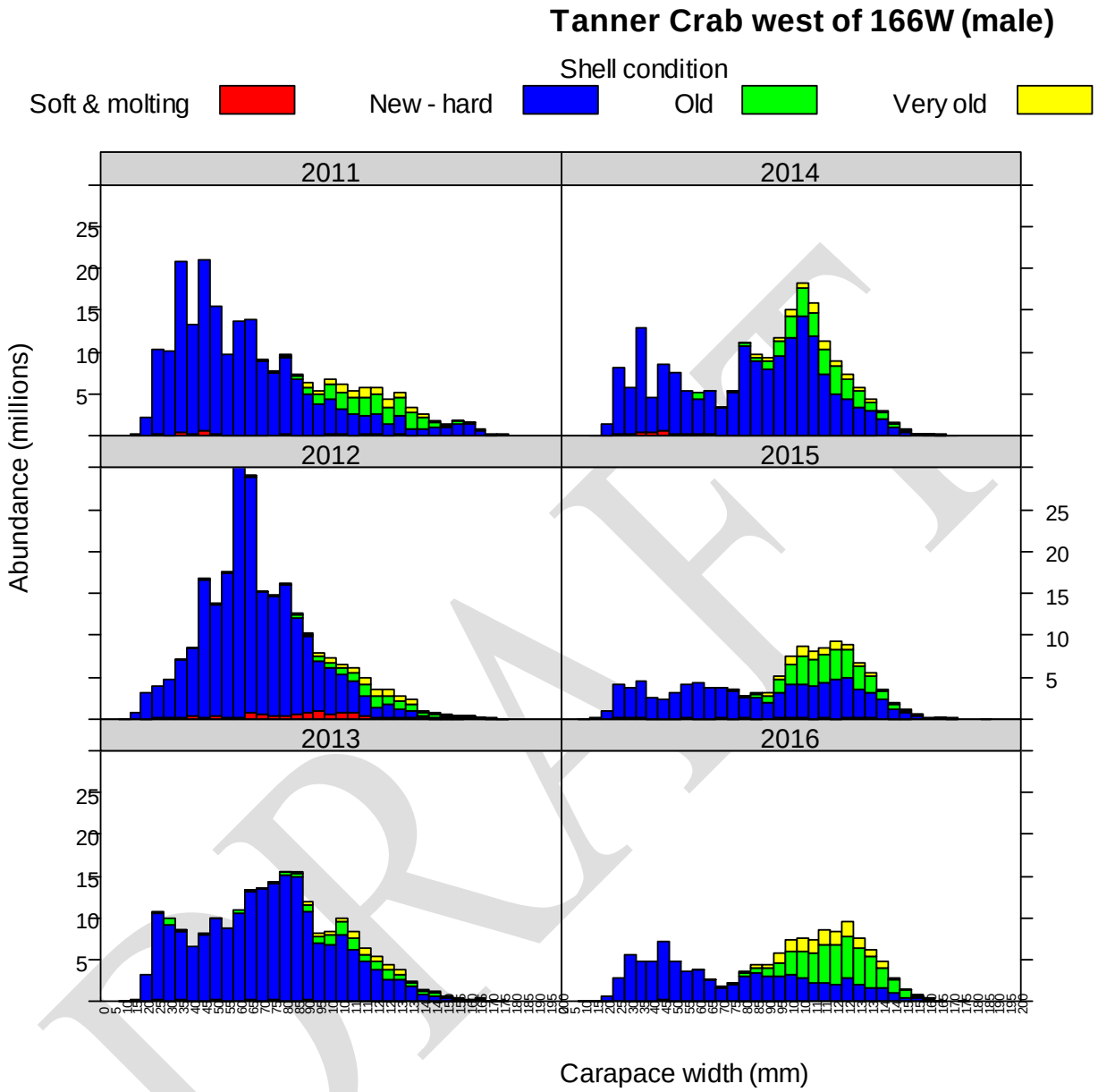

Figure 56. -- Size frequency by shell condition of male Tanner crab (*Chionoecetes bairdi*) west of 166° W by 5 mm width classes of all districts combined, 2011-2016.

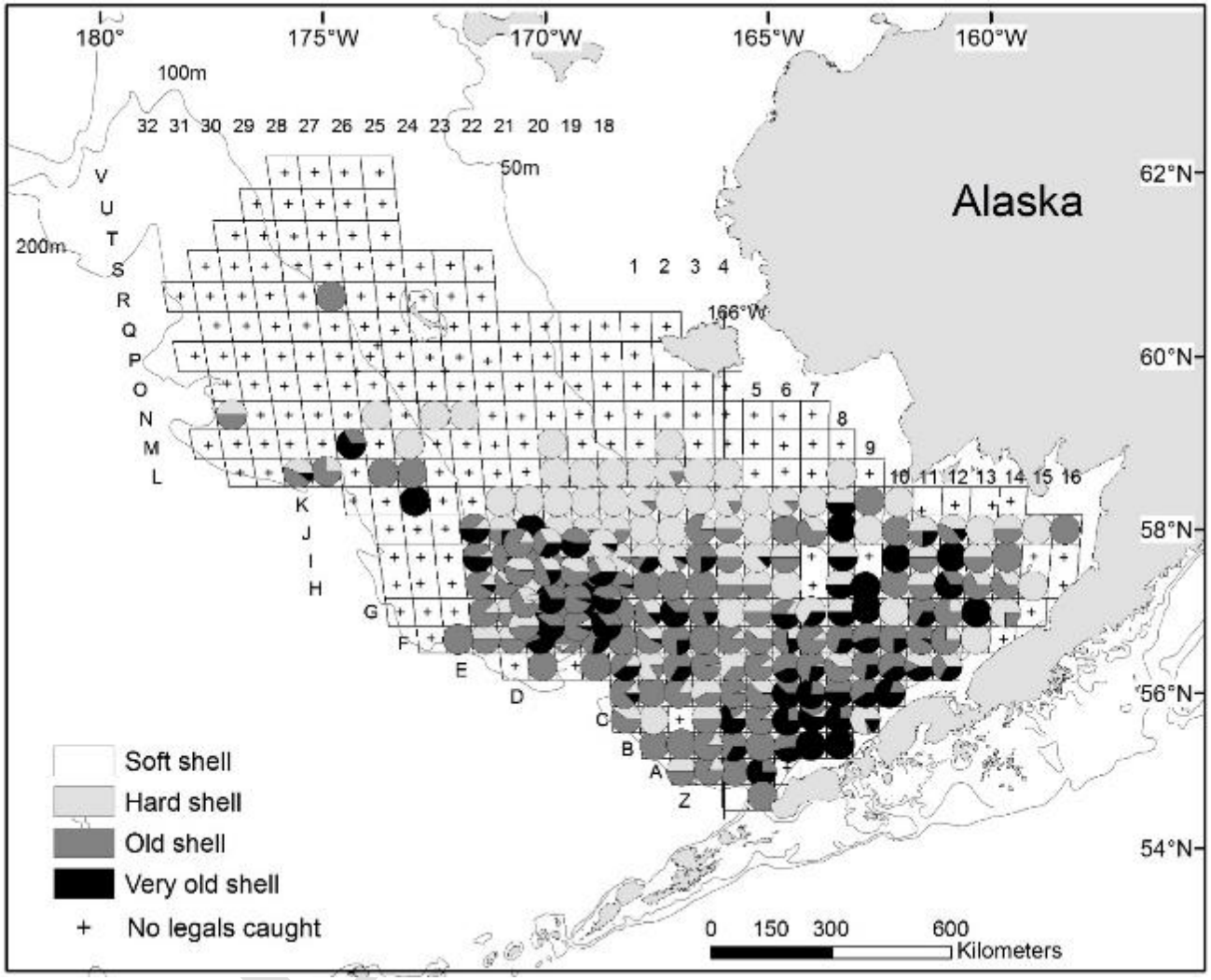

Figure 57. -- Distribution of legal-sized male Tanner crab (*Chionoecetes bairdi*) caught at each station in 2016 and distinguished by shell condition. Tanner male crab ≥ 120 mm and ≥ 110 mm CW are the legal-size categories for east and west of 166° W, respectively.

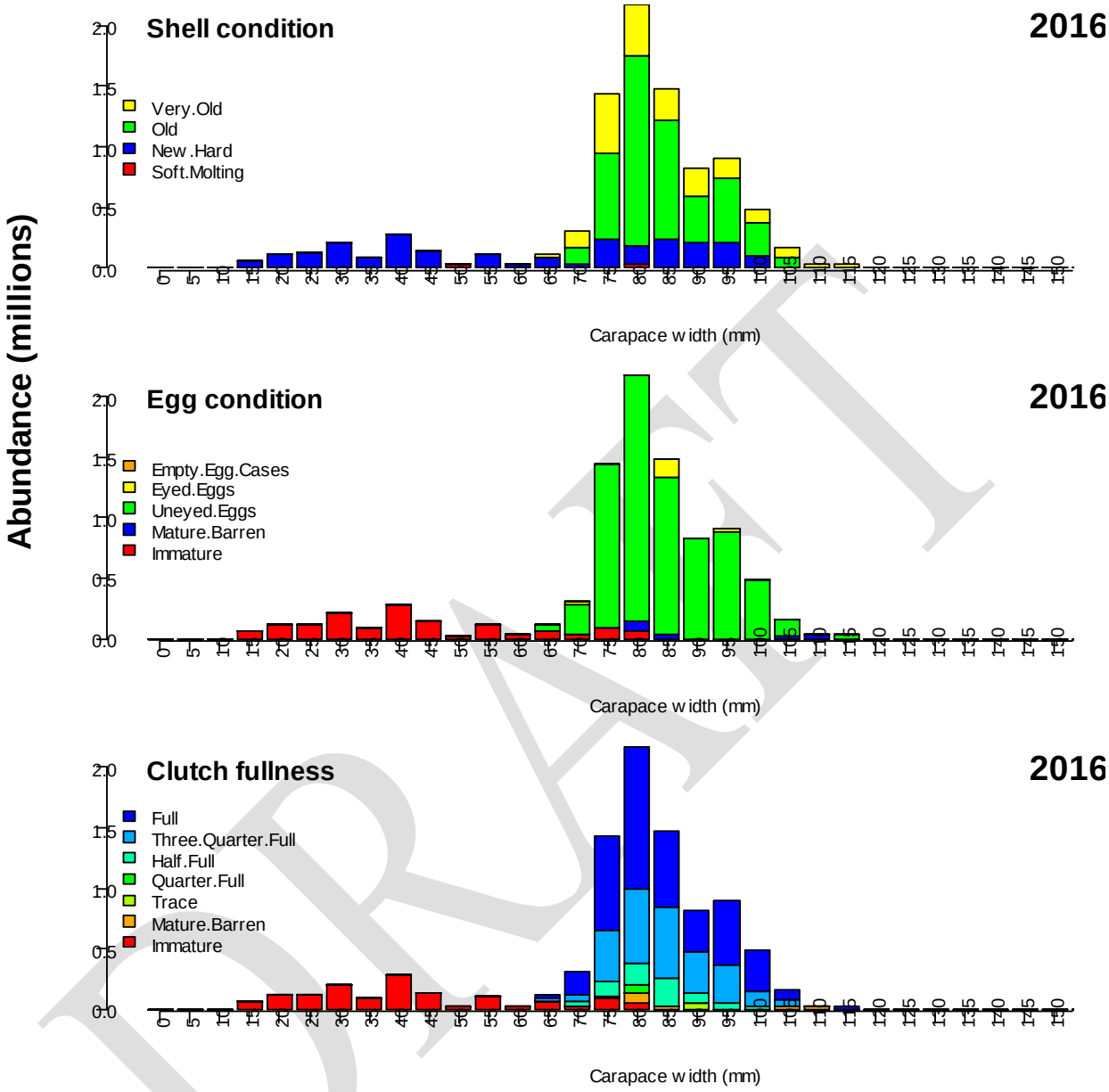

Figure 58. -- Size frequency by shell condition, egg condition, and clutch fullness of female Tanner crab (*Chionoecetes bairdi*) east of 166° W by 5 mm width classes for all districts combined in 2016.

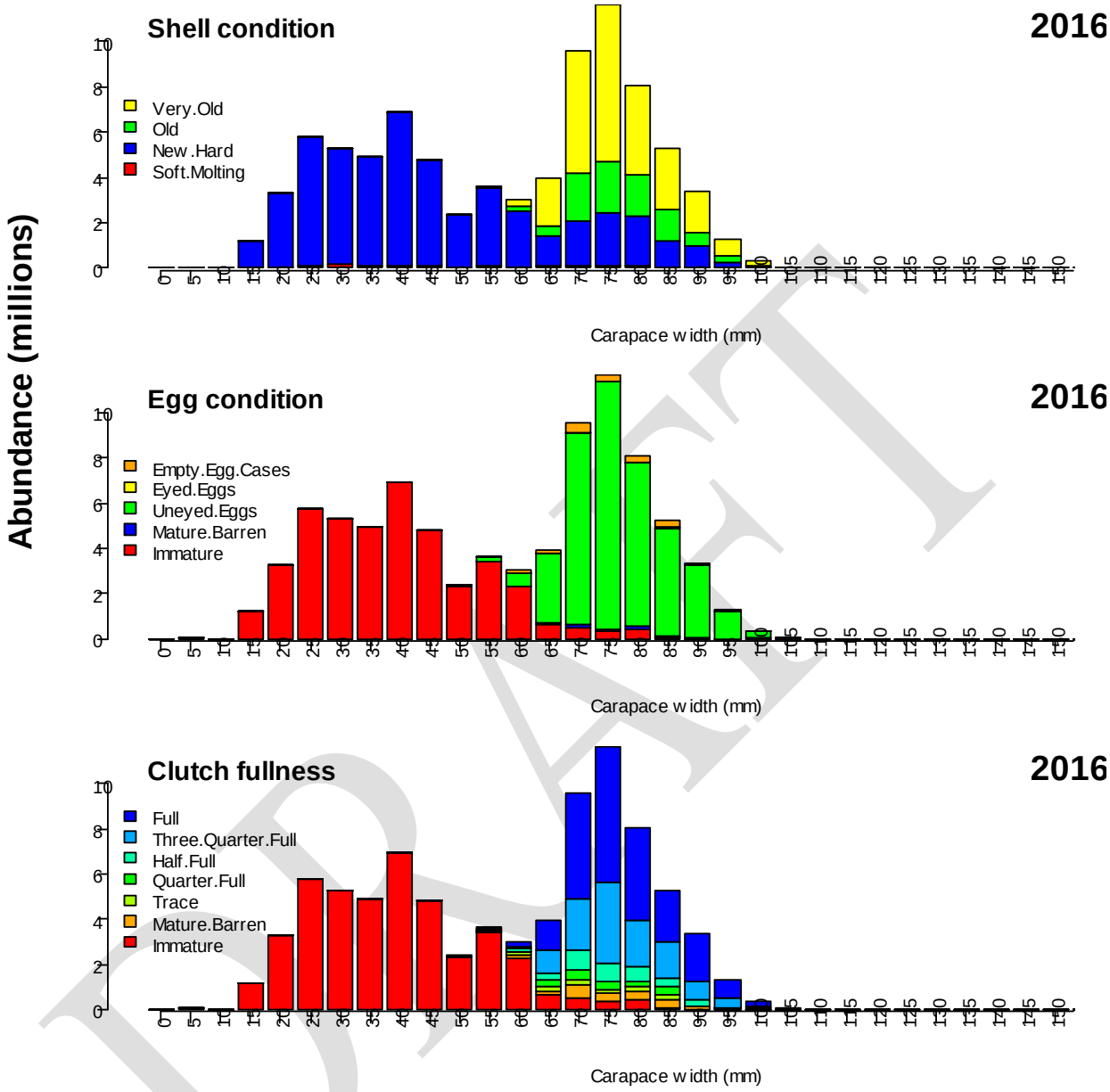

Figure 59. -- Size frequency by shell condition, egg condition, and clutch fullness of female Tanner crab (*Chionoecetes bairdi*) west of 166° W by 5 mm width classes for all districts combined in 2016.

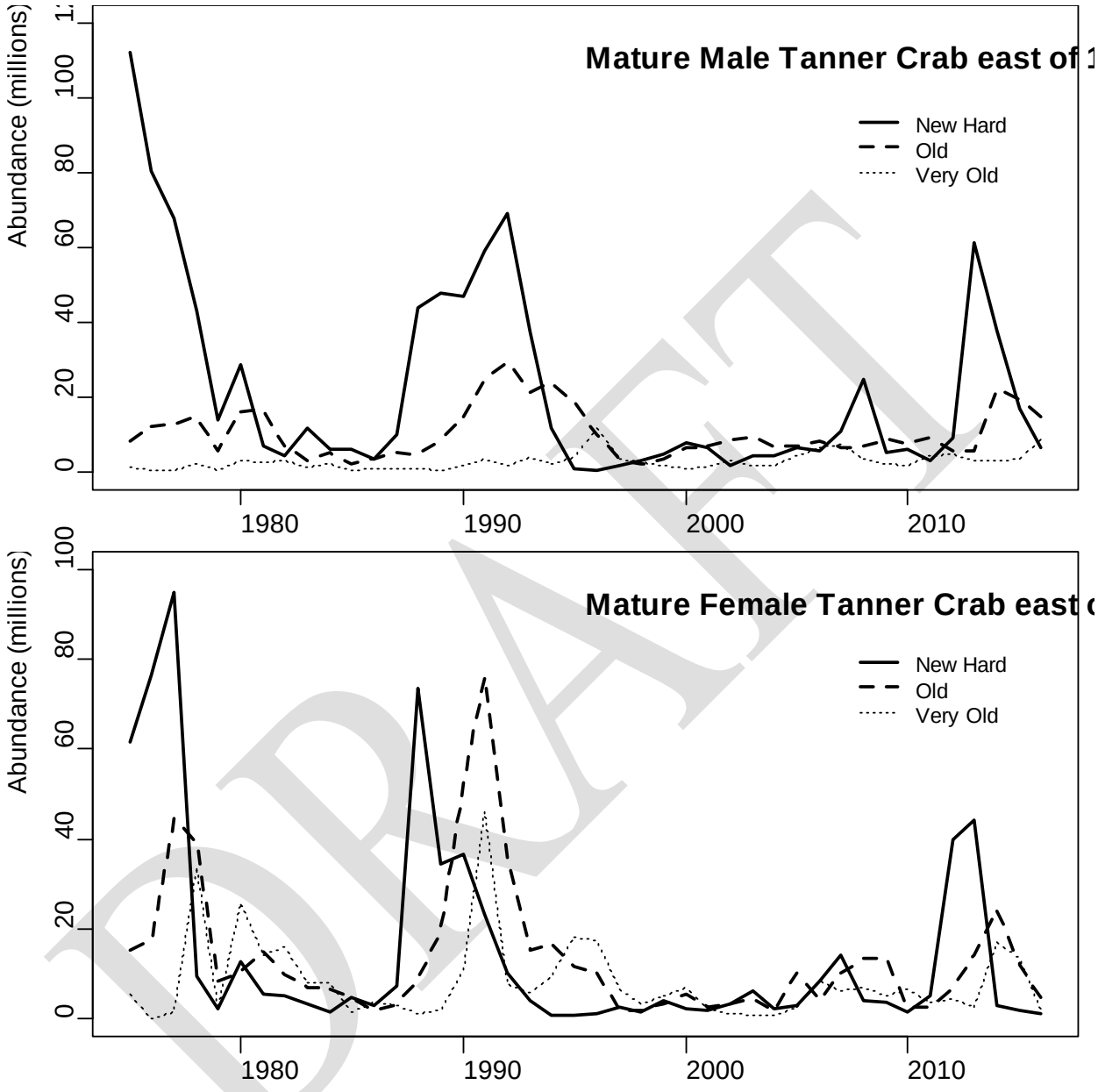

Figure 60. -- Time series of mature male (≥ 113 mm CW) and female (actual maturity) Tanner crab (*Chionoecetes bairdi*) east of 166° W by shell condition, 1975-2016. New-Hard = shell condition 2; Old = shell condition 3; Very Old = shell condition 4 and 5 combined.

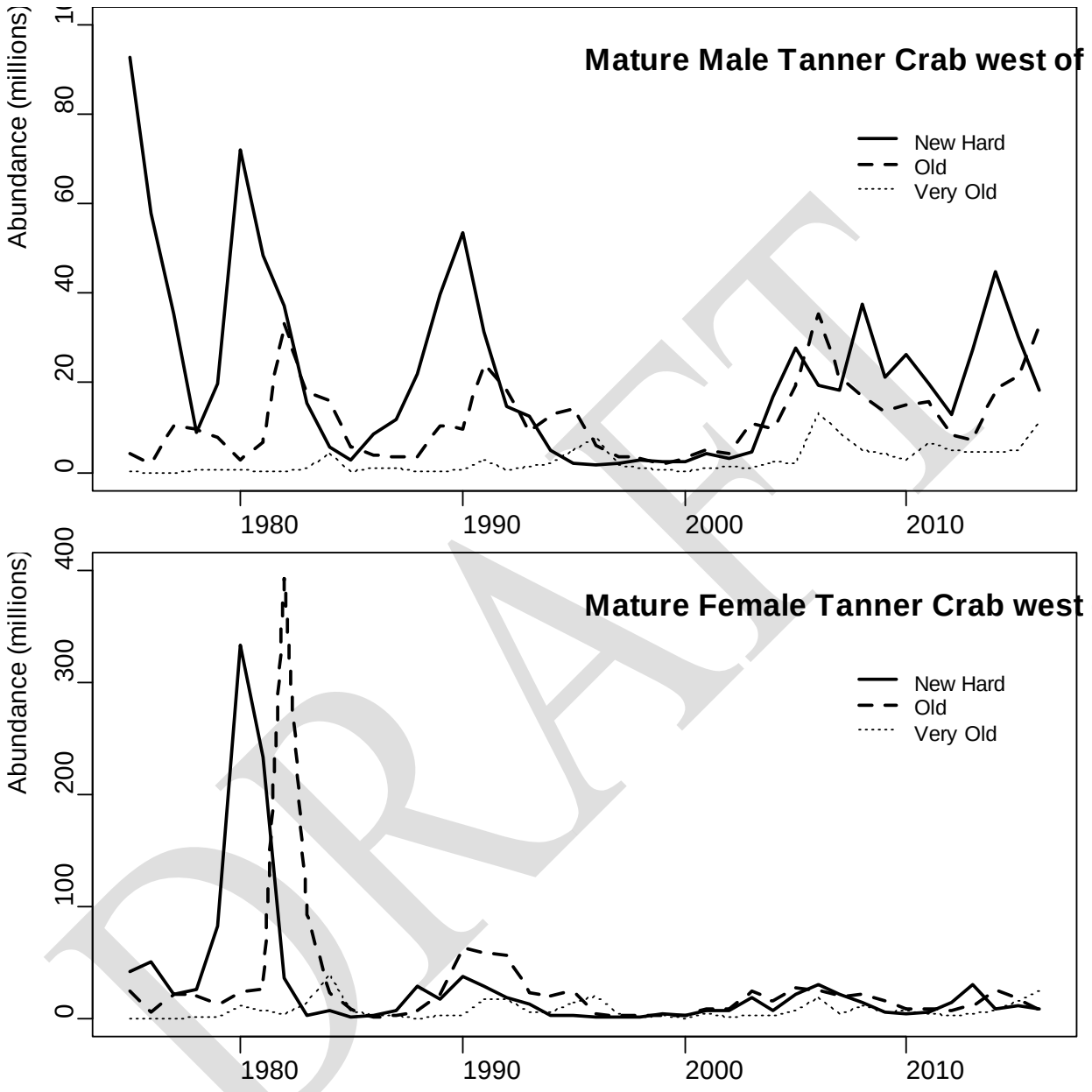

Figure 61. -- Time series of mature male (≥ 103 mm CW) and female (actual maturity) Tanner crab (*Chionoecetes bairdi*) west of 166° W by shell condition, 1975-2016. New-Hard = shell condition 2; Old = shell condition 3; Very Old = shell condition 4 and 5 combined.

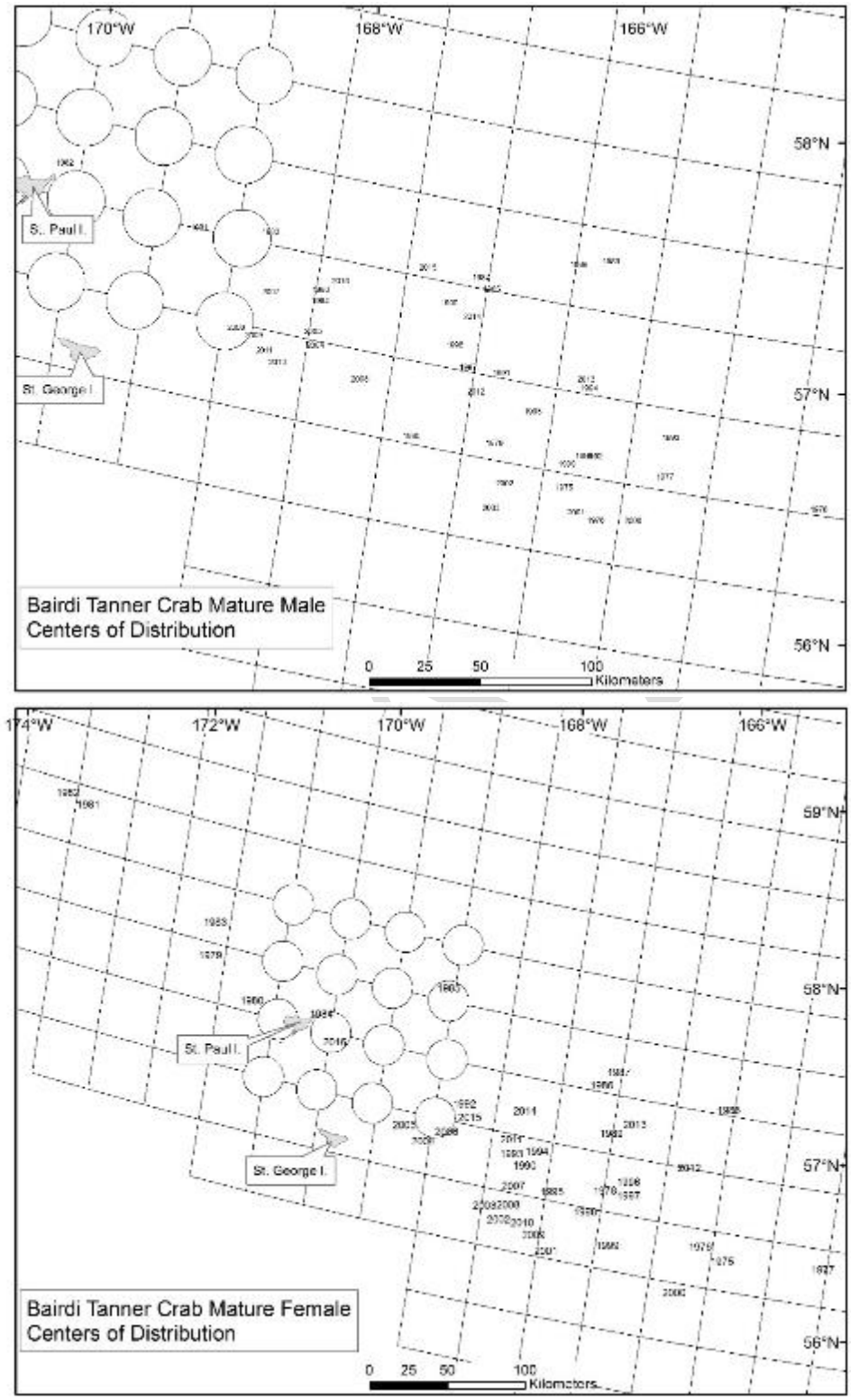

Figure 62. -- Centers of stock distribution of male and female Tanner crab (*Chionoecetes bairdi*) from 1975 to 2016.

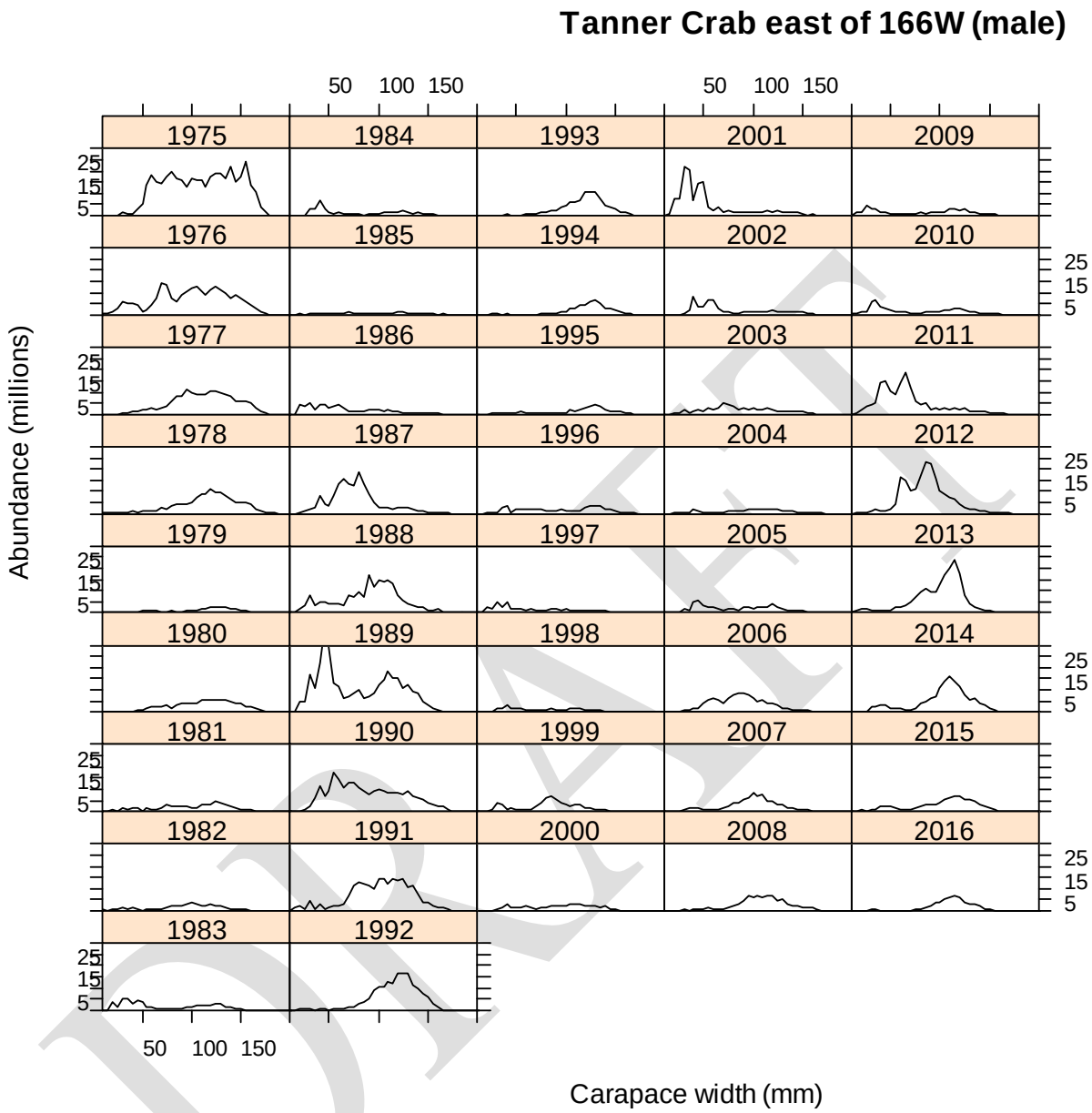

Figure 63. -- Historical size frequency by 5 mm width classes of male Tanner crab (*Chionoecetes bairdi*) east of 166°W, 1975 to 2016.

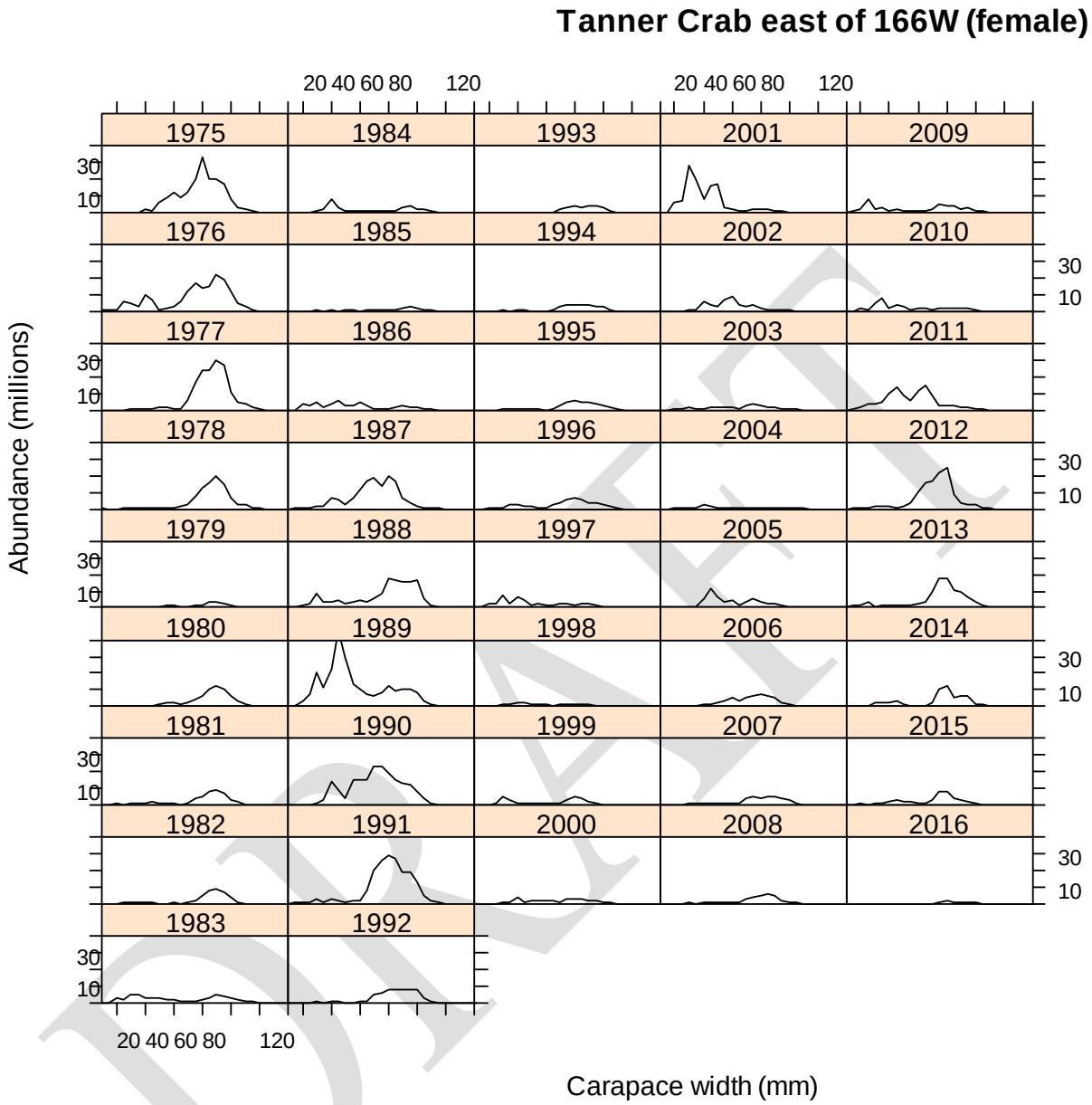

Figure 64. -- Historical size frequency by 5 mm width classes of female Tanner crab (*Chionoecetes bairdi*) east of 166°W, 1975 to 2016.

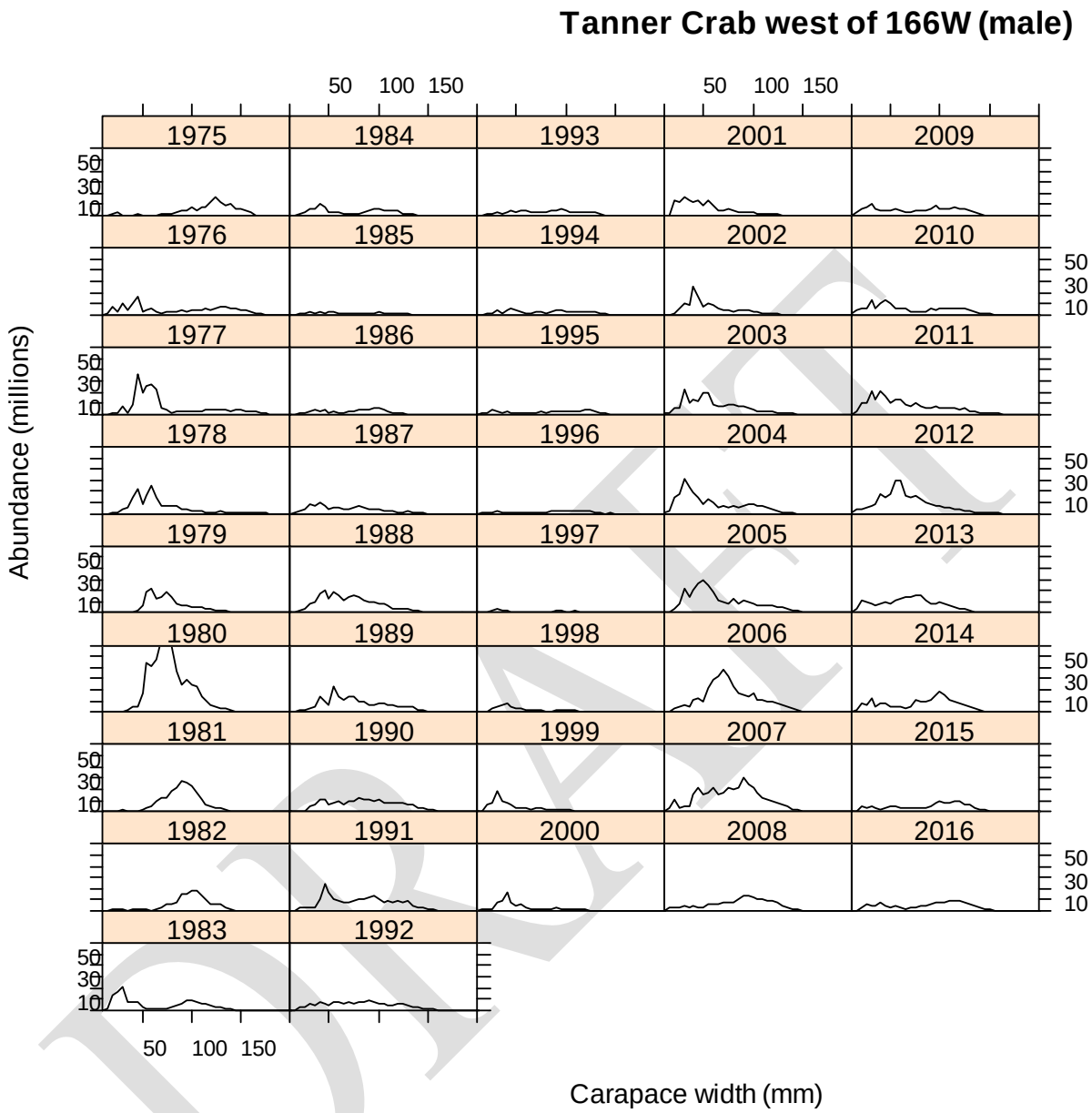

Figure 65. -- Historical size frequency by 5 mm width classes of male Tanner crab (*Chionoecetes bairdi*) west of 166°W, 1975 to 2016.

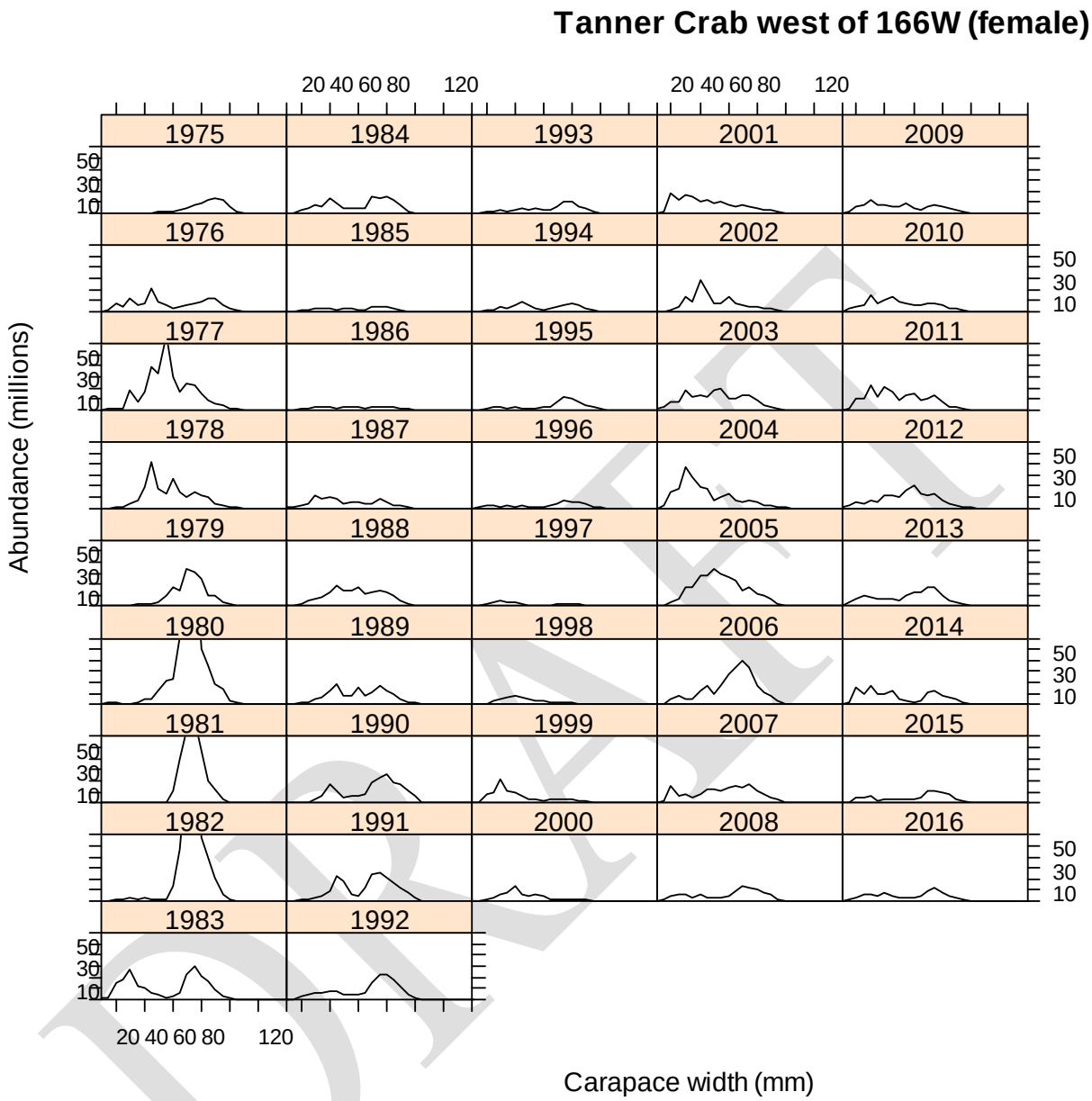

Figure 66. -- Historical size frequency by 5 mm width classes of female Tanner crab (*Chionoecetes bairdi*) west of 166°W, 1975 to 2016.

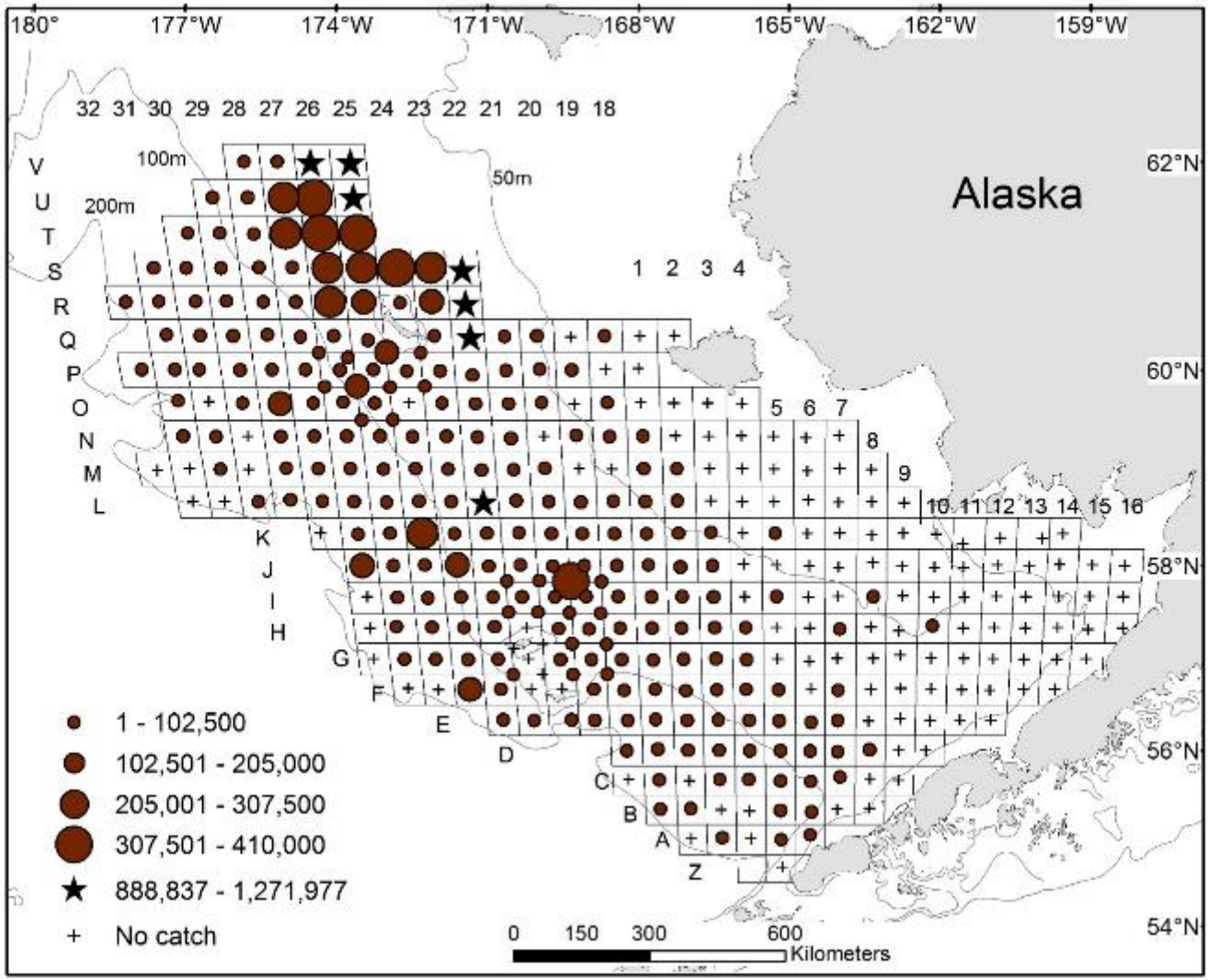

Figure 67. -- Total density (number nmi^{-2}) of snow crab (*Chionoecetes opilio*) at each station sampled in 2016. Data depicted by circles are equal interval densities, while stars are densities larger than the standard scale.

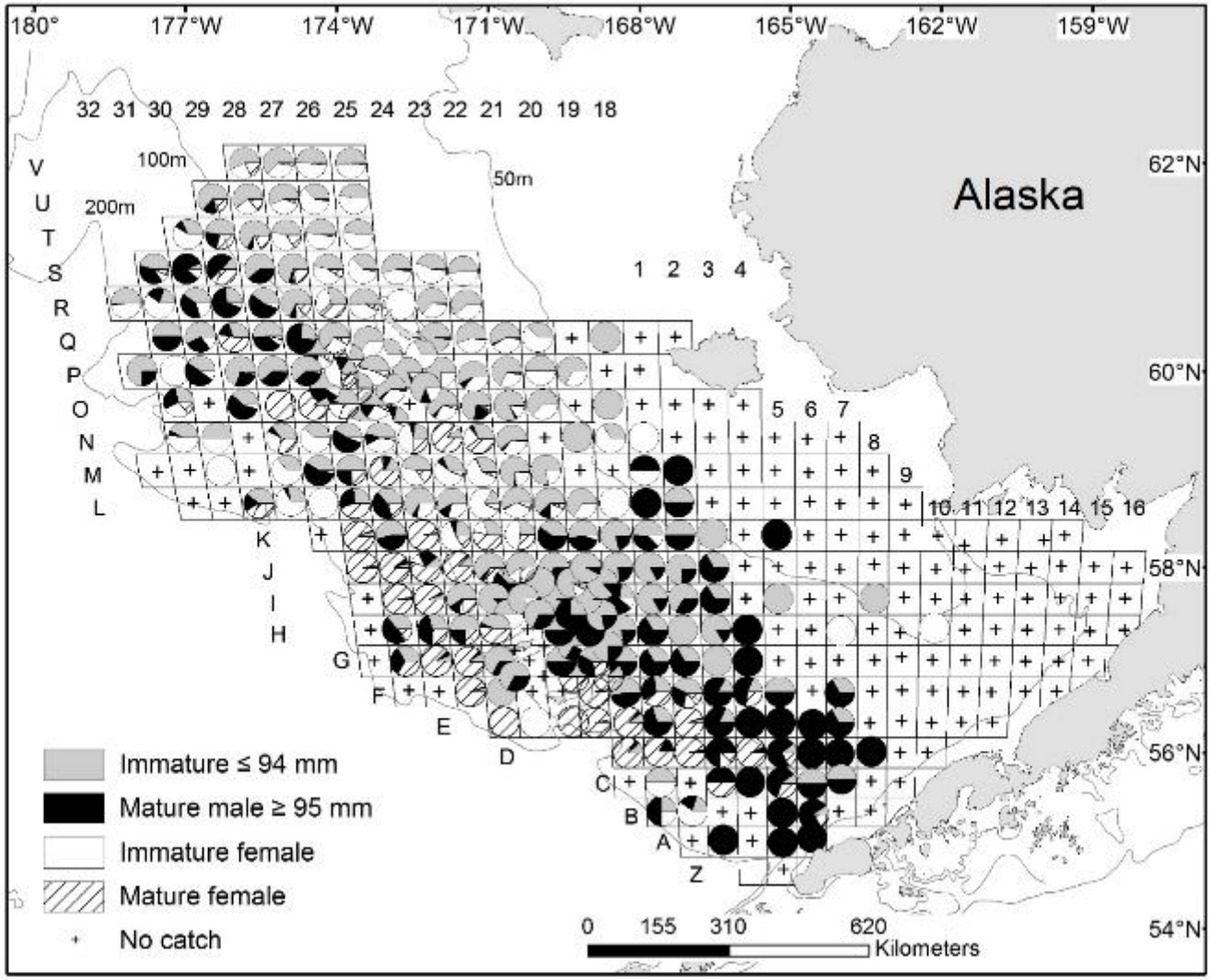

Figure 68. -- Percentage of male and female snow crab (*Chionoecetes opilio*) maturity categories at each station sampled in 2016.

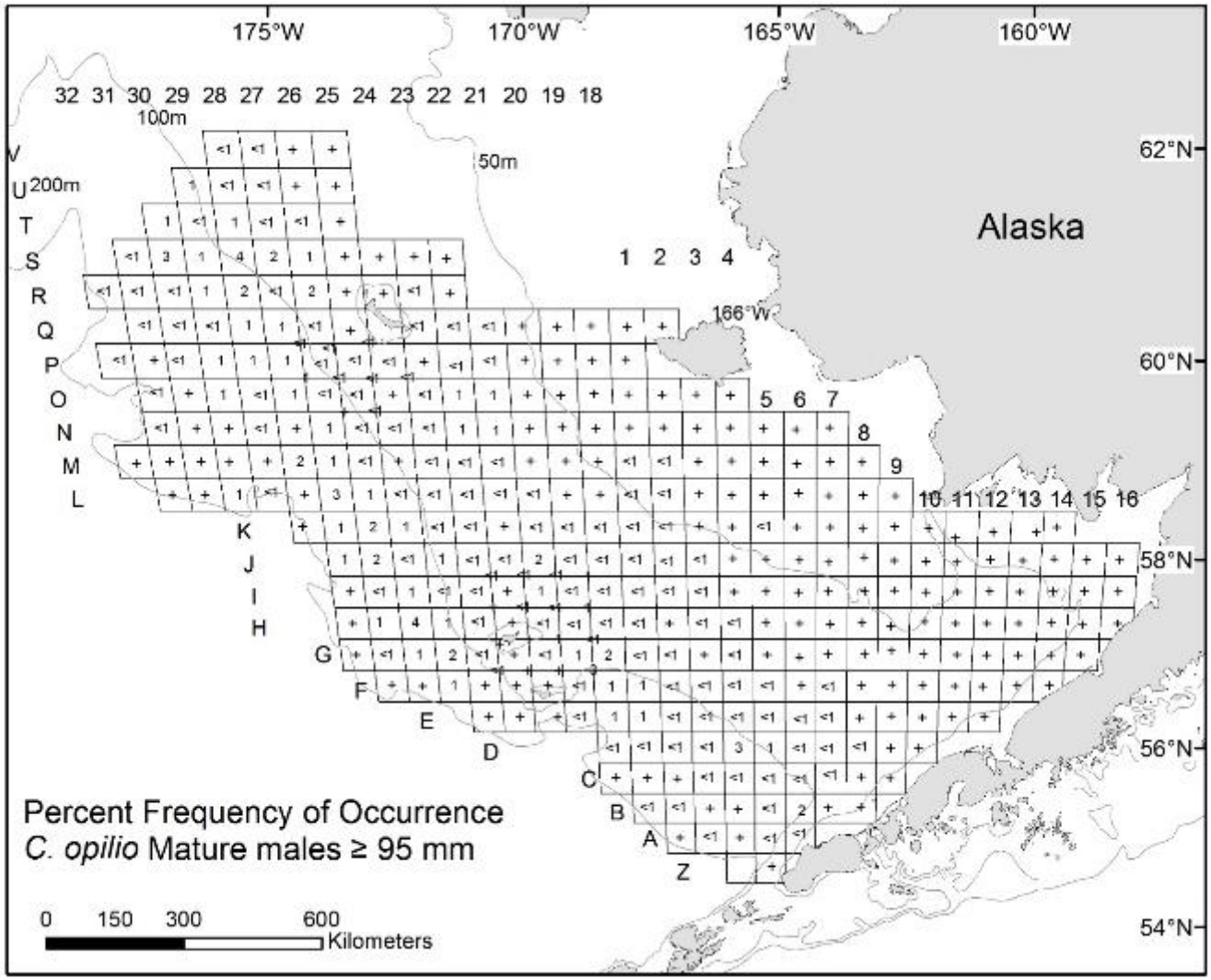

Figure 69. -- Percent frequency of occurrence of mature male snow crab (*Chionoecetes opilio*) at stations sampled in 2016.

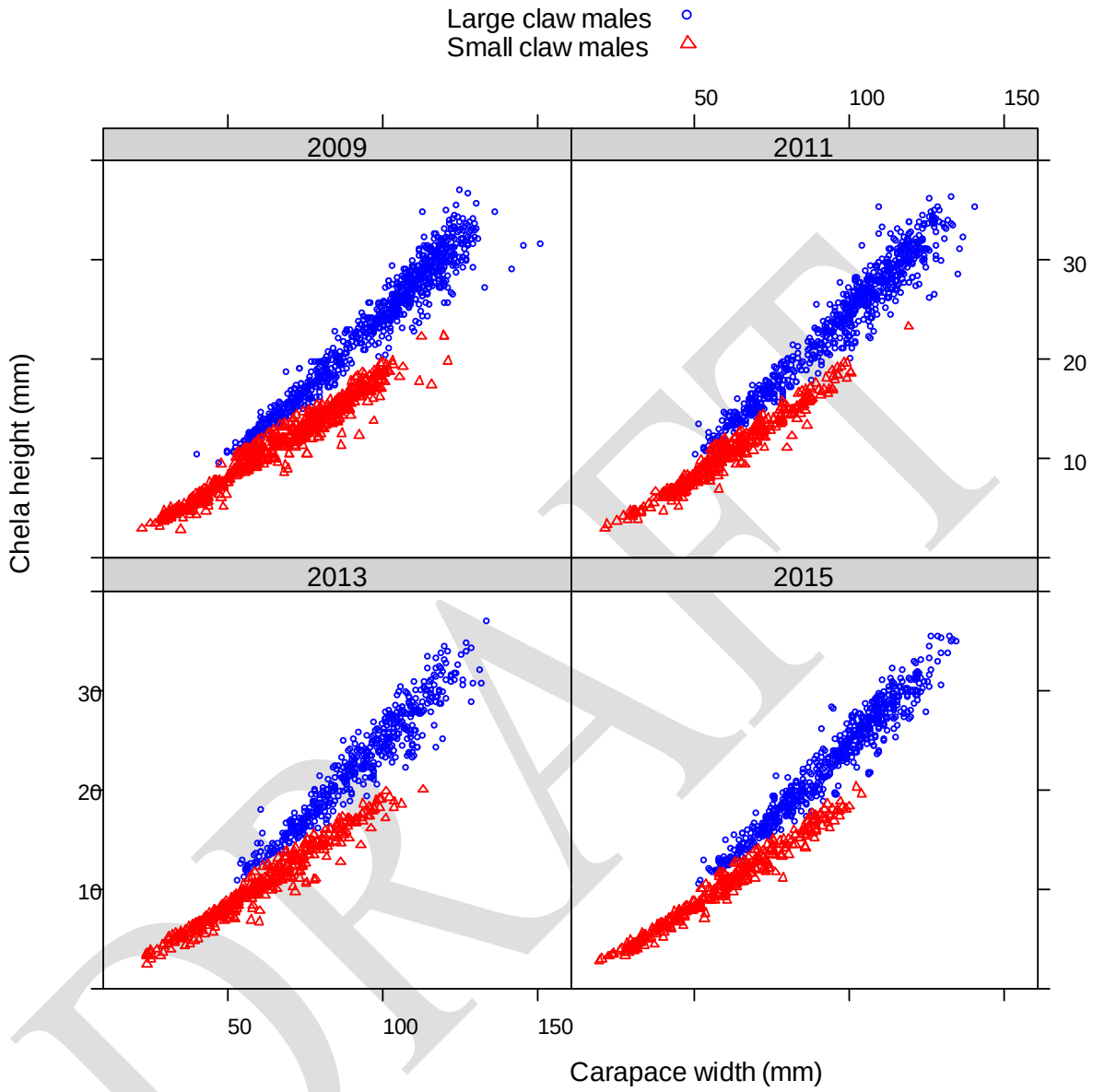

Figure 70. -- Male snow crab (*Chionoecetes opilio*) chela height versus carapace width measurements collected during the 2009 (n = 1,303), 2011 (n = 1,130), 2013 (n = 943), and 2015 (n = 1,008) National Marine Fisheries Service eastern Bering Sea bottom trawl surveys.

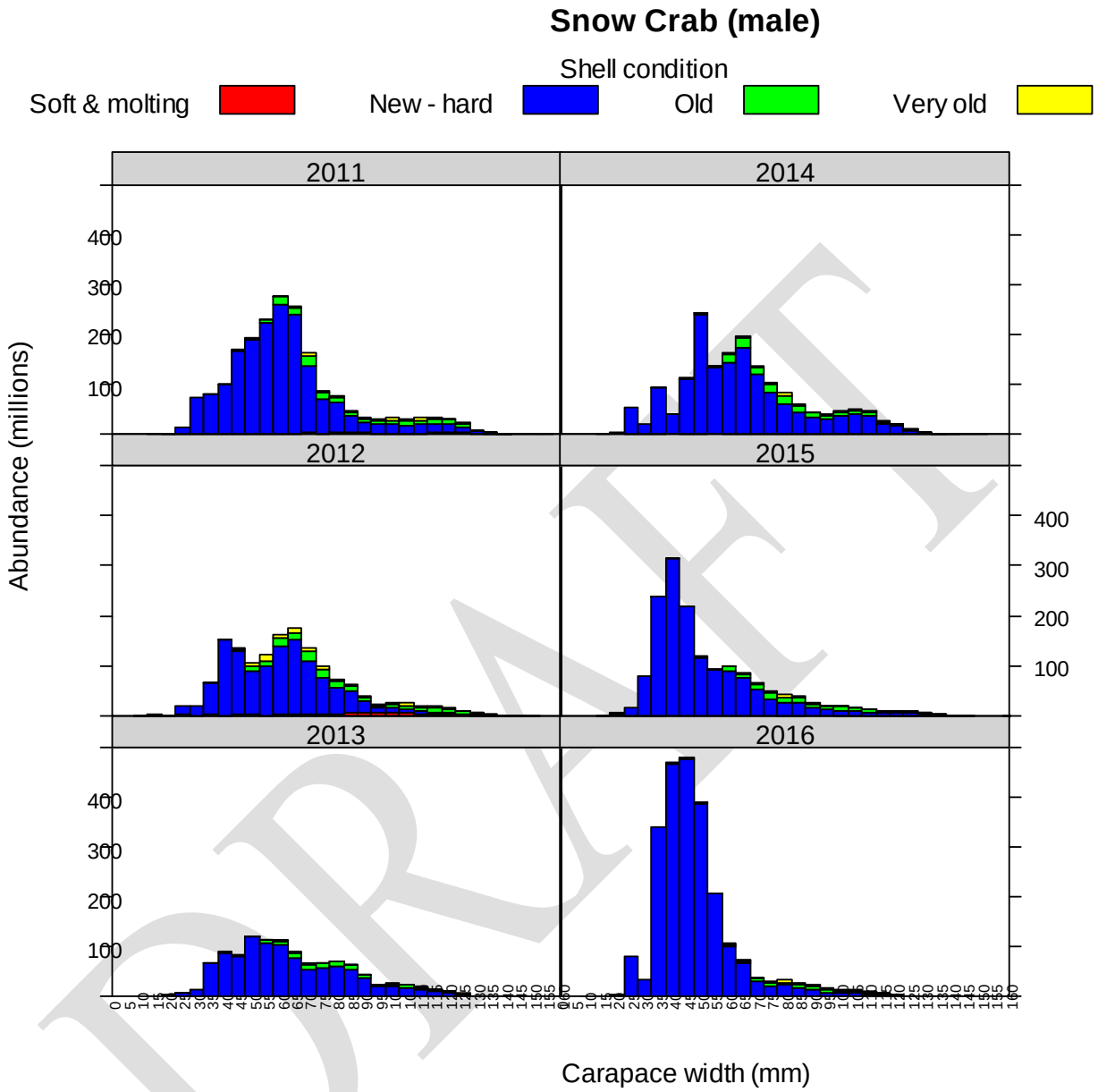

Figure 71. -- Size frequency by shell condition of male snow crab (*Chionoecetes opilio*) by 5 mm width classes of all districts combined, 2011-2016.

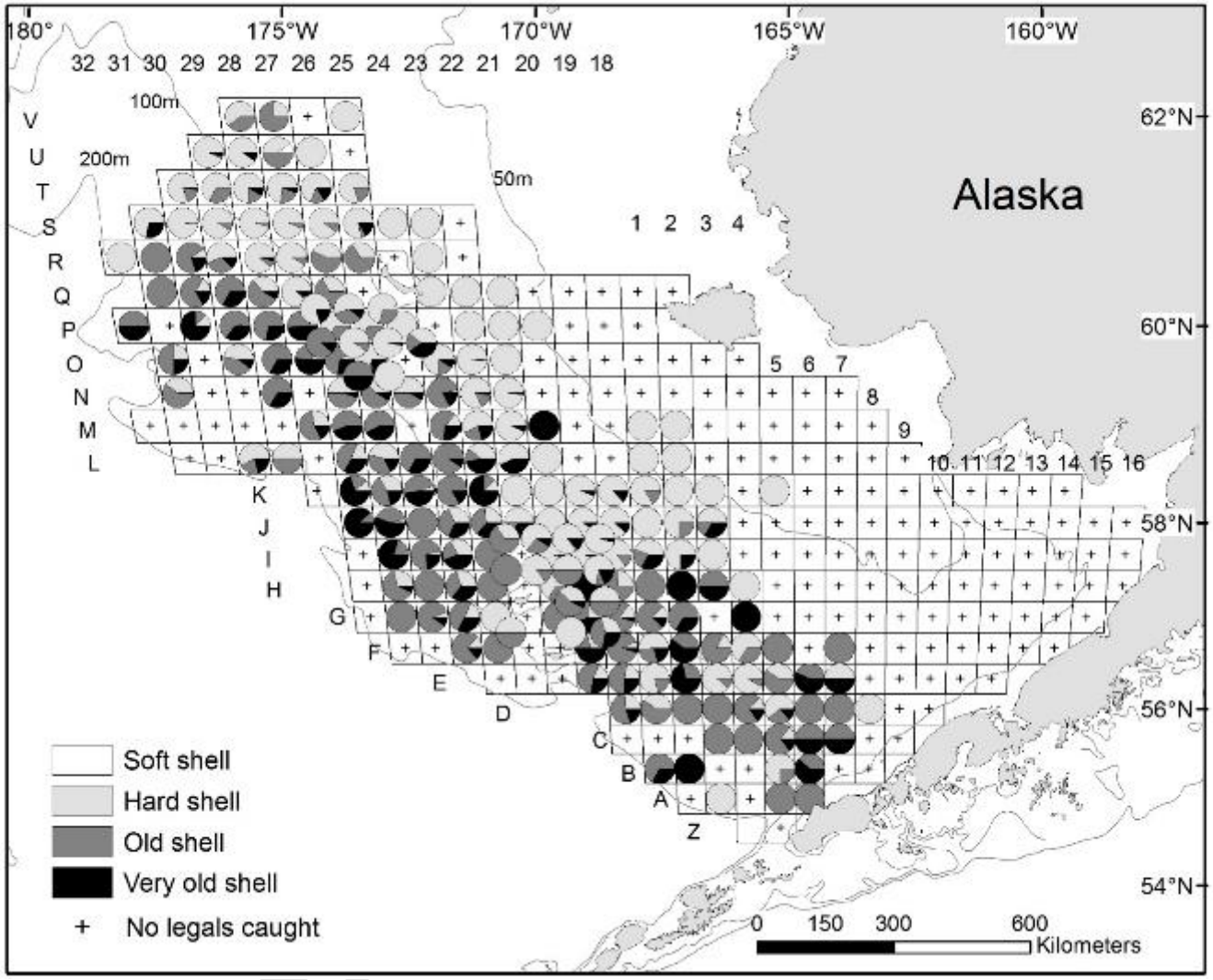

Figure 72. -- Distribution of legal-sized male snow crab (*Chionoecetes opilio*) caught at each station in 2016 and distinguished by shell condition.

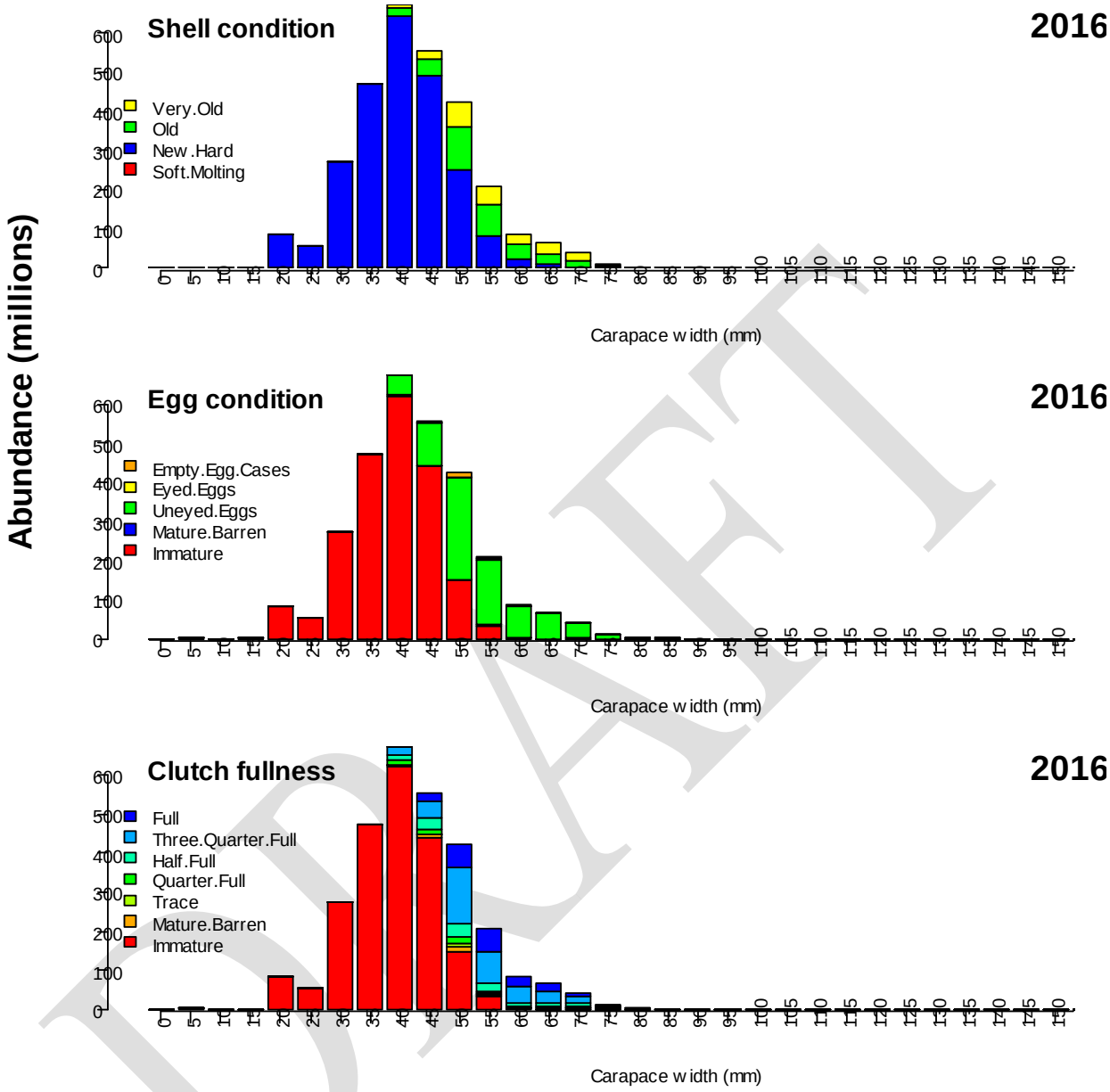

Figure 73. -- Size frequency by shell condition, egg condition, and clutch fullness of female snow crab (*Chionoecetes opilio*) by 5 mm width classes of all districts combined in 2016.

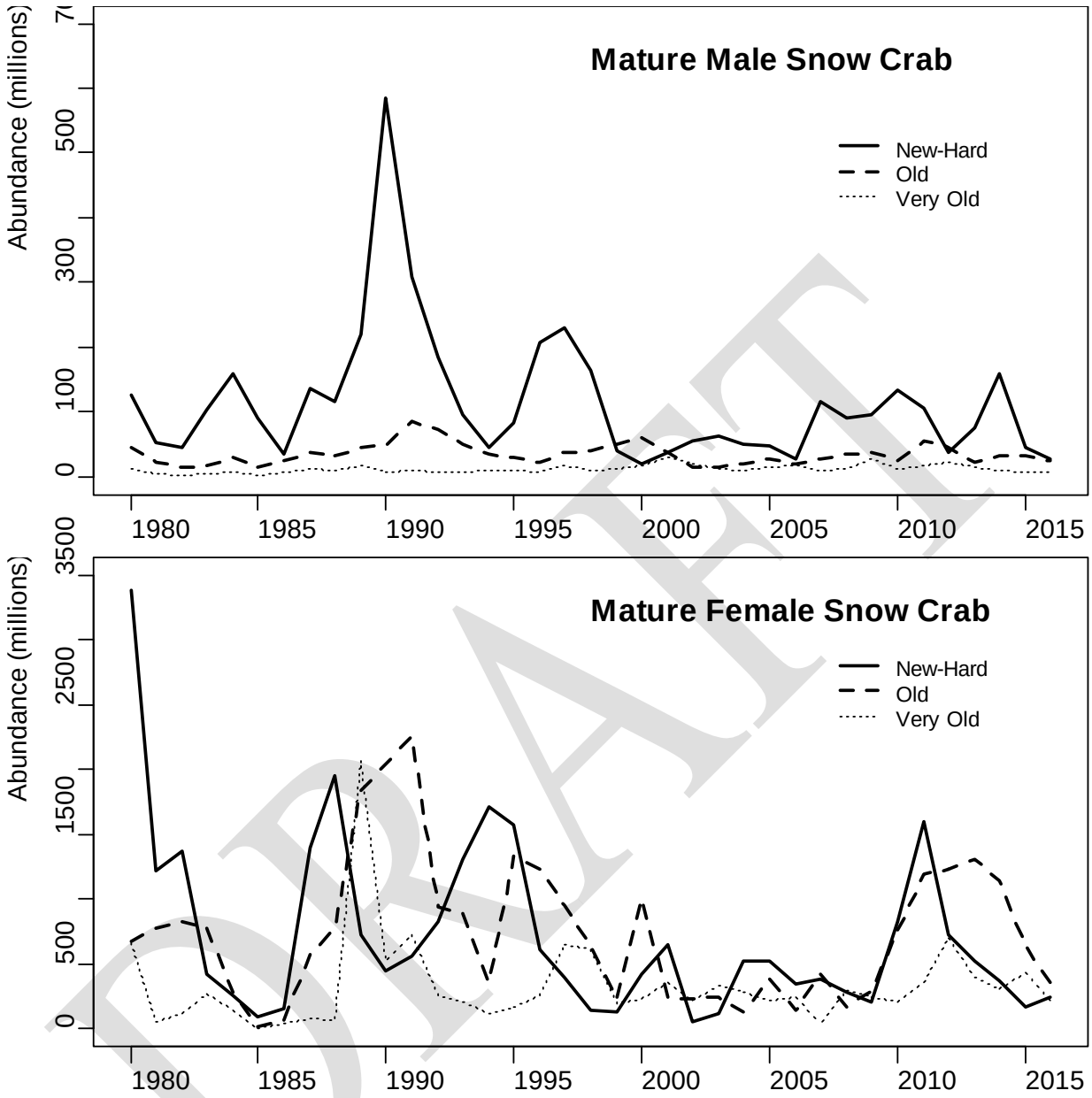

Figure 74. -- Time series of mature male (≥ 95 mm CW) and female (actual maturity) snow crab (*Chionoecetes opilio*) by shell condition, 1980-2016. New- Hard = shell condition 2; Old = shell condition 3; Very Old = shell condition 4 and 5 combined.

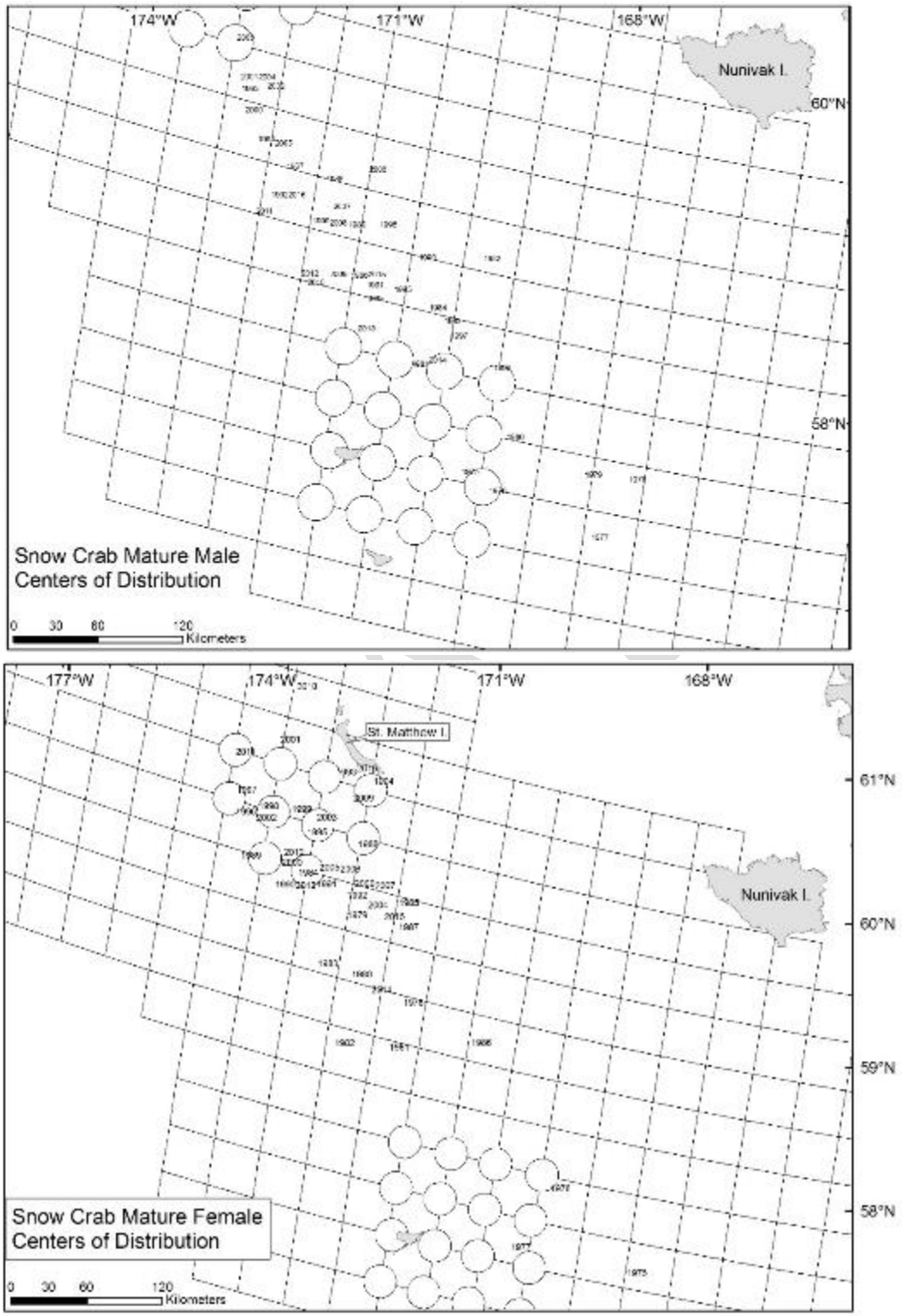

Figure 75. -- Centers of stock distribution of male and female snow crab (*Chionoecetes opilio*) from 1975 to 2016.

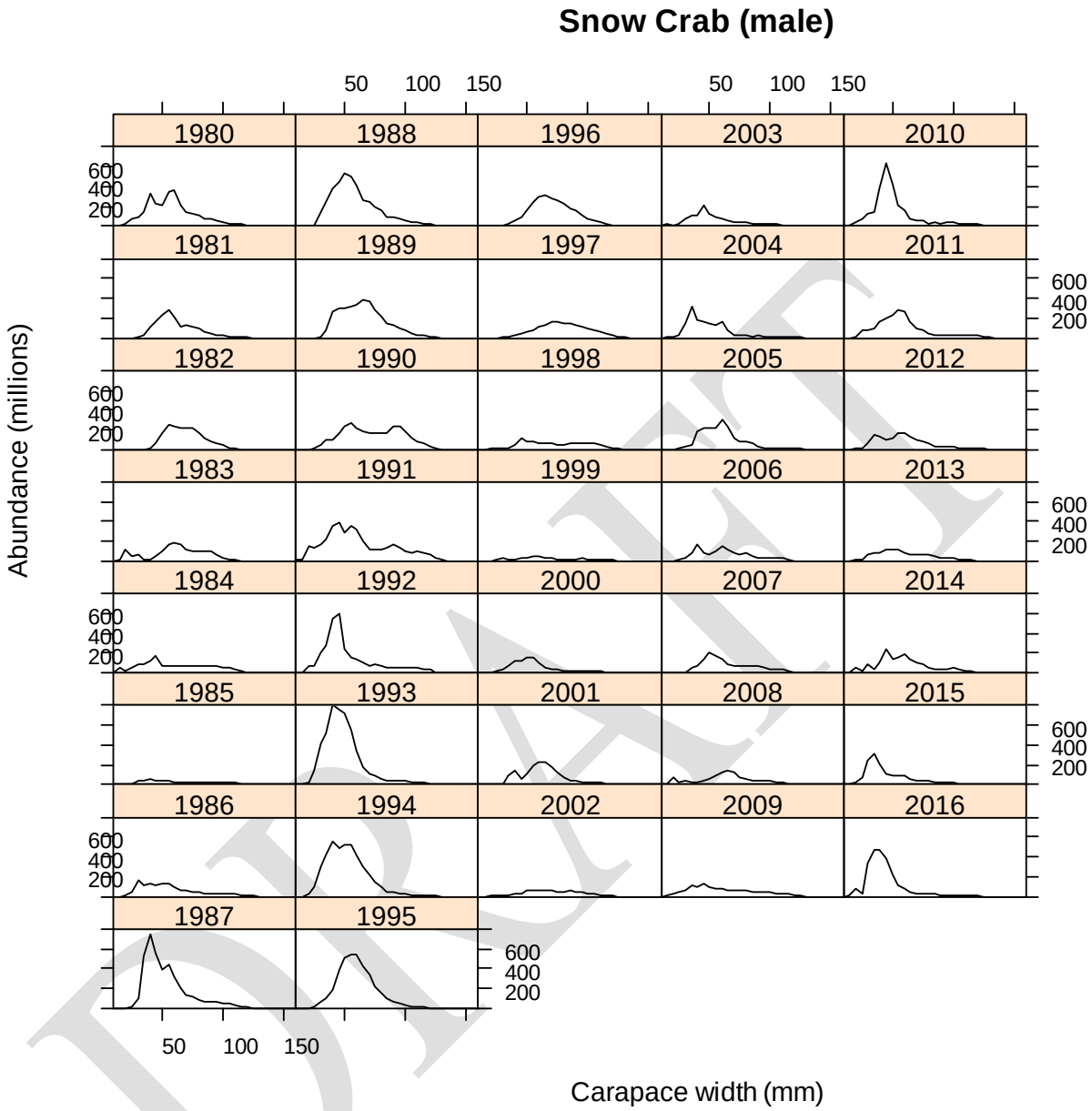

Figure 76. -- Historical size frequency by 5 mm width classes of male snow crab (*Chionoecetes opilio*), 1980 to 2016.

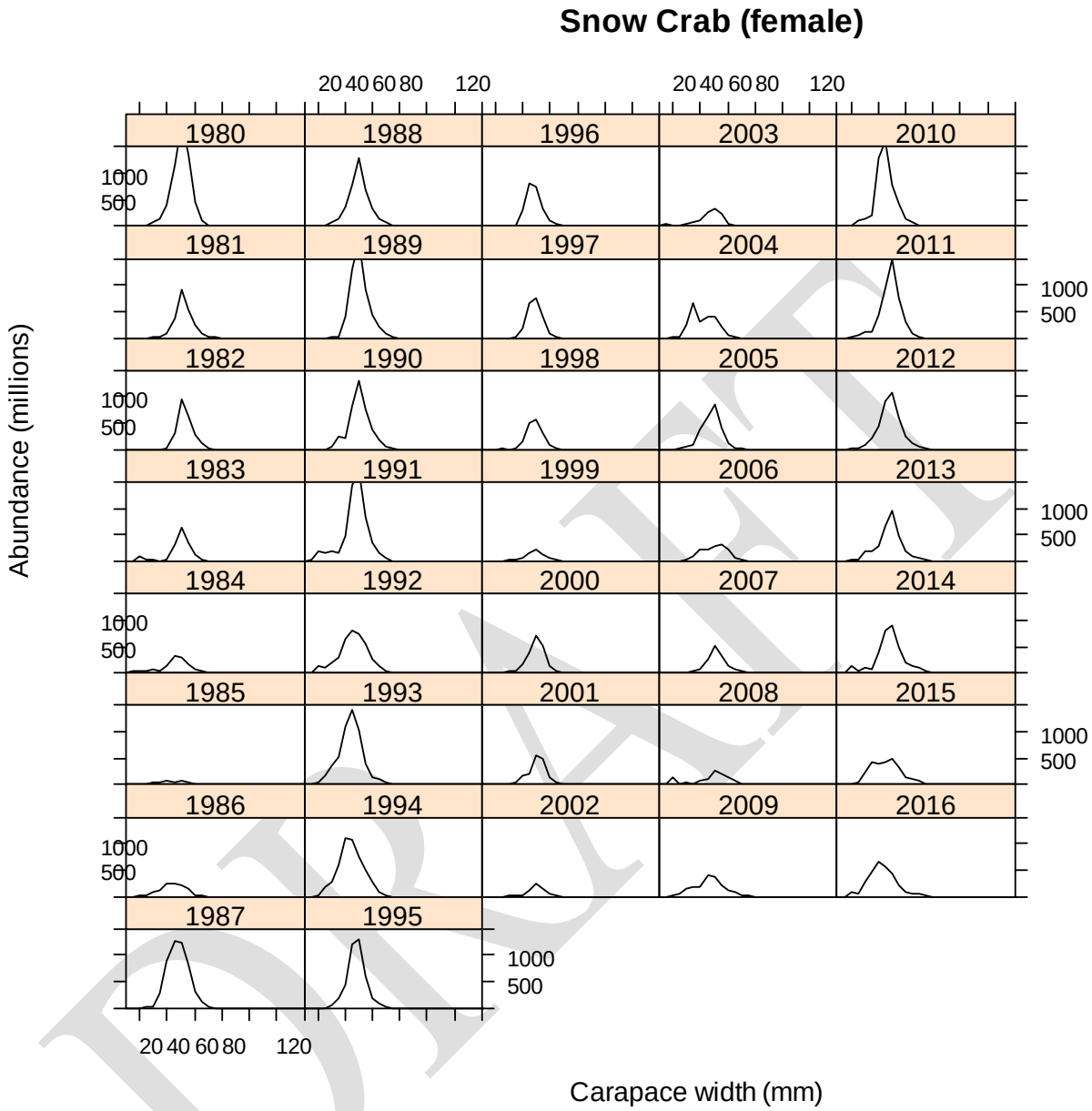

Figure 77. -- Historical size frequency by 5 mm width classes of female snow crab (*Chionoecetes opilio*), 1980 to 2016.

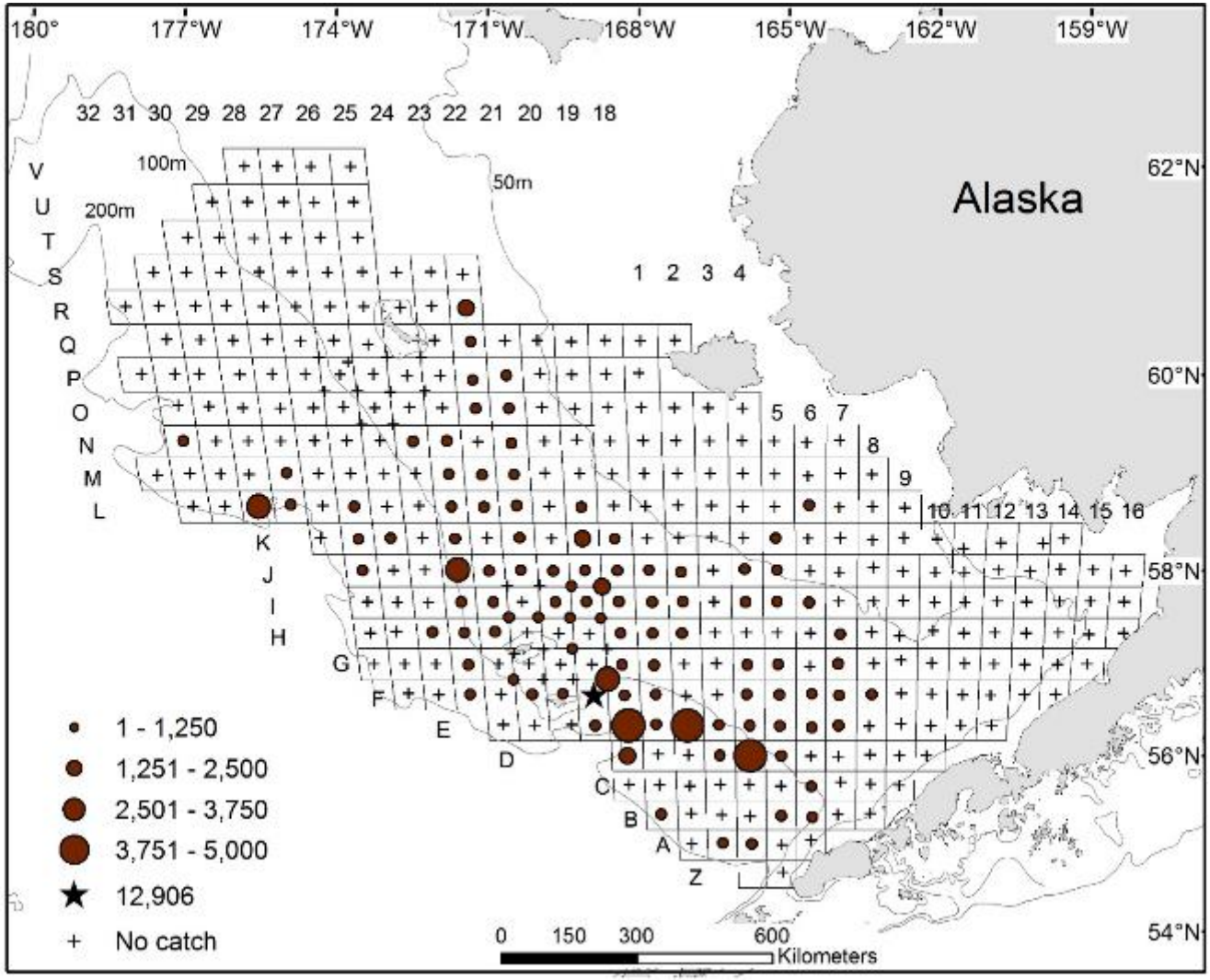

Figure 78. -- Total density (number nmi^{-2}) of *Chionoecetes* spp. hybrid crab at each station sampled in 2016. Data depicted by circles are crab densities at equal intervals.

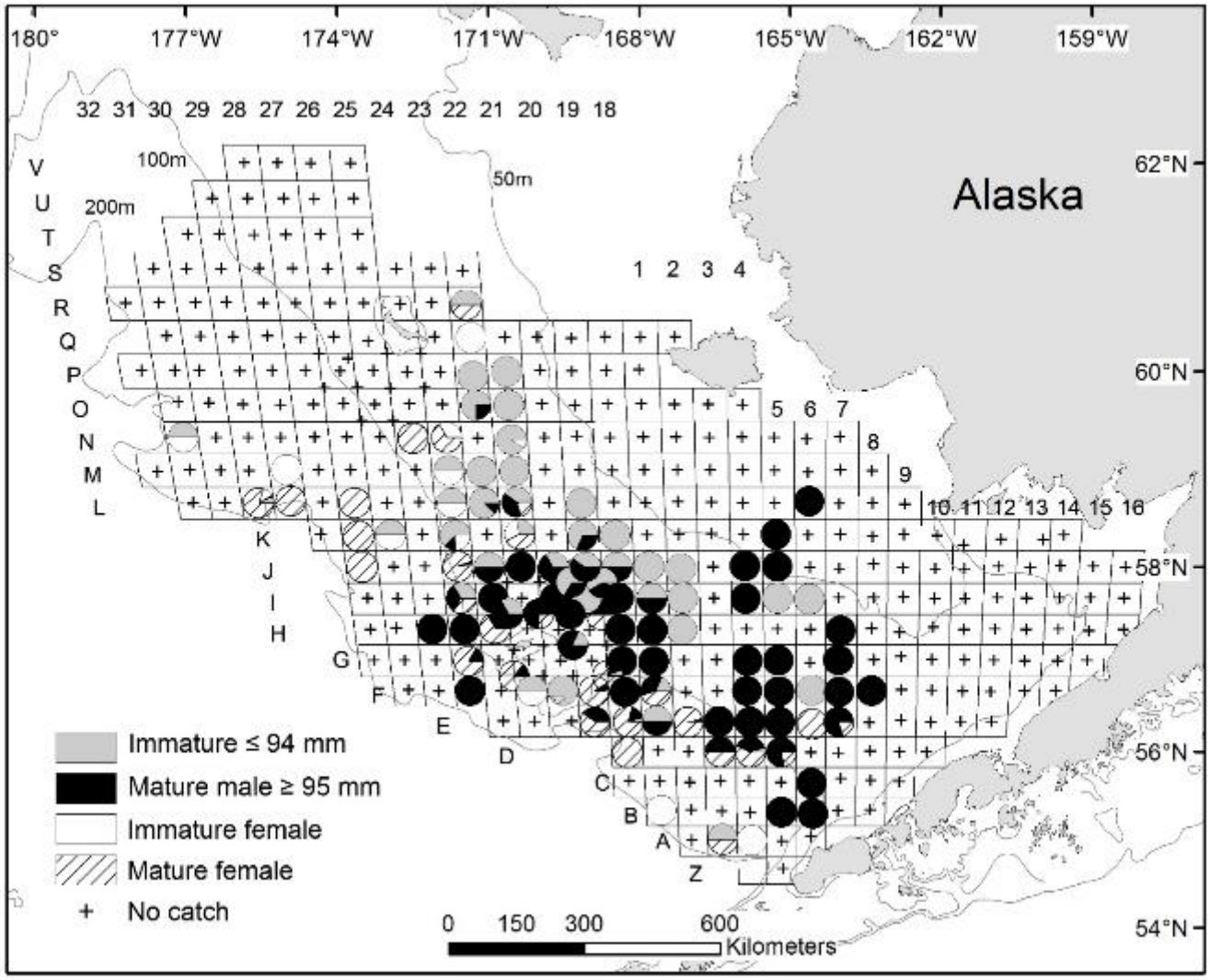

Figure 79. -- Percentage of male and female *Chionoecetes* spp. hybrid crab size and maturity categories at each station sampled in 2016.

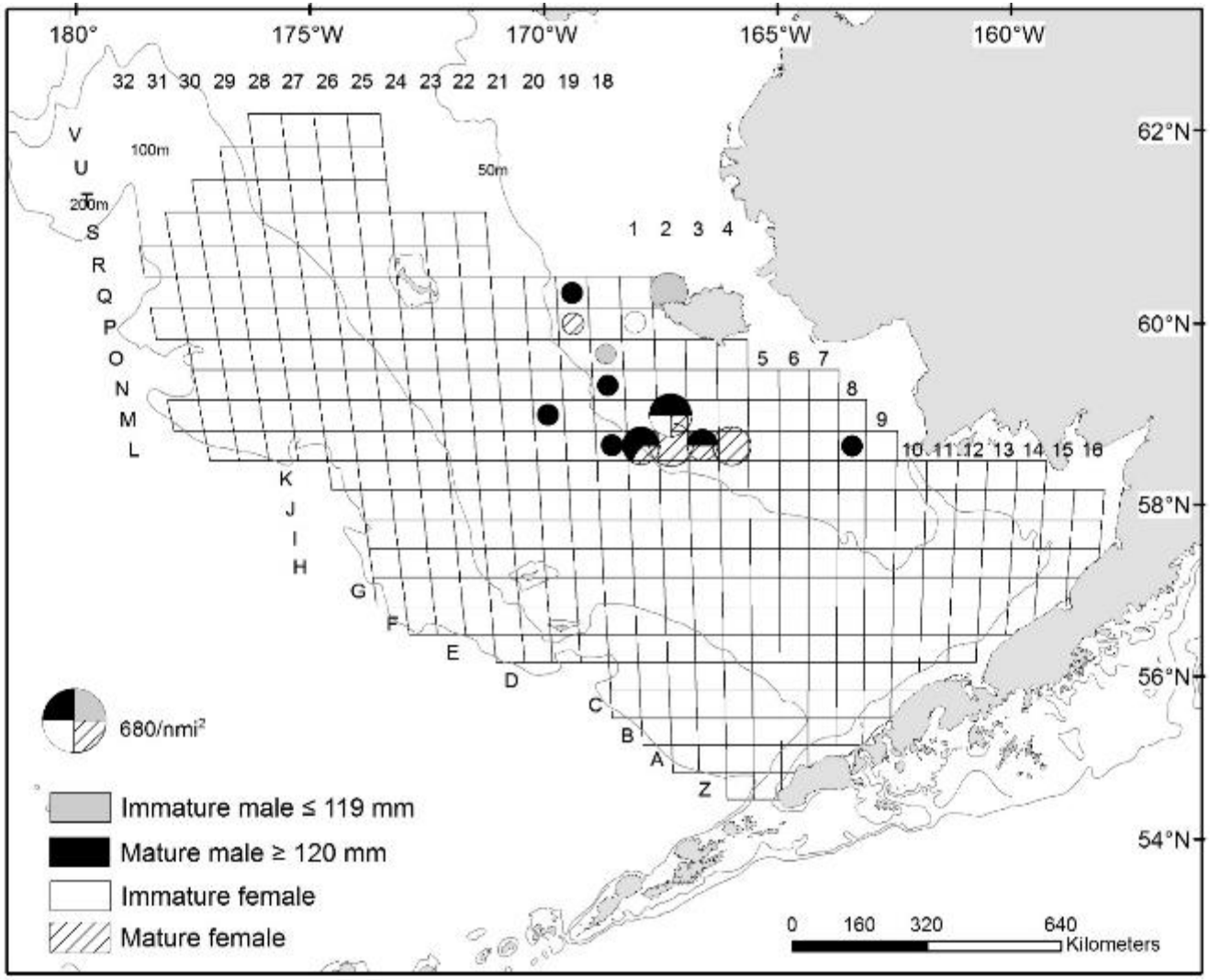

Figure 80. -- Total density (number nmi^{-2}) and percentage of male and female red king crab (*Paralithodes camtschaticus*) maturity categories at each station sampled in the Northern District in 2016.

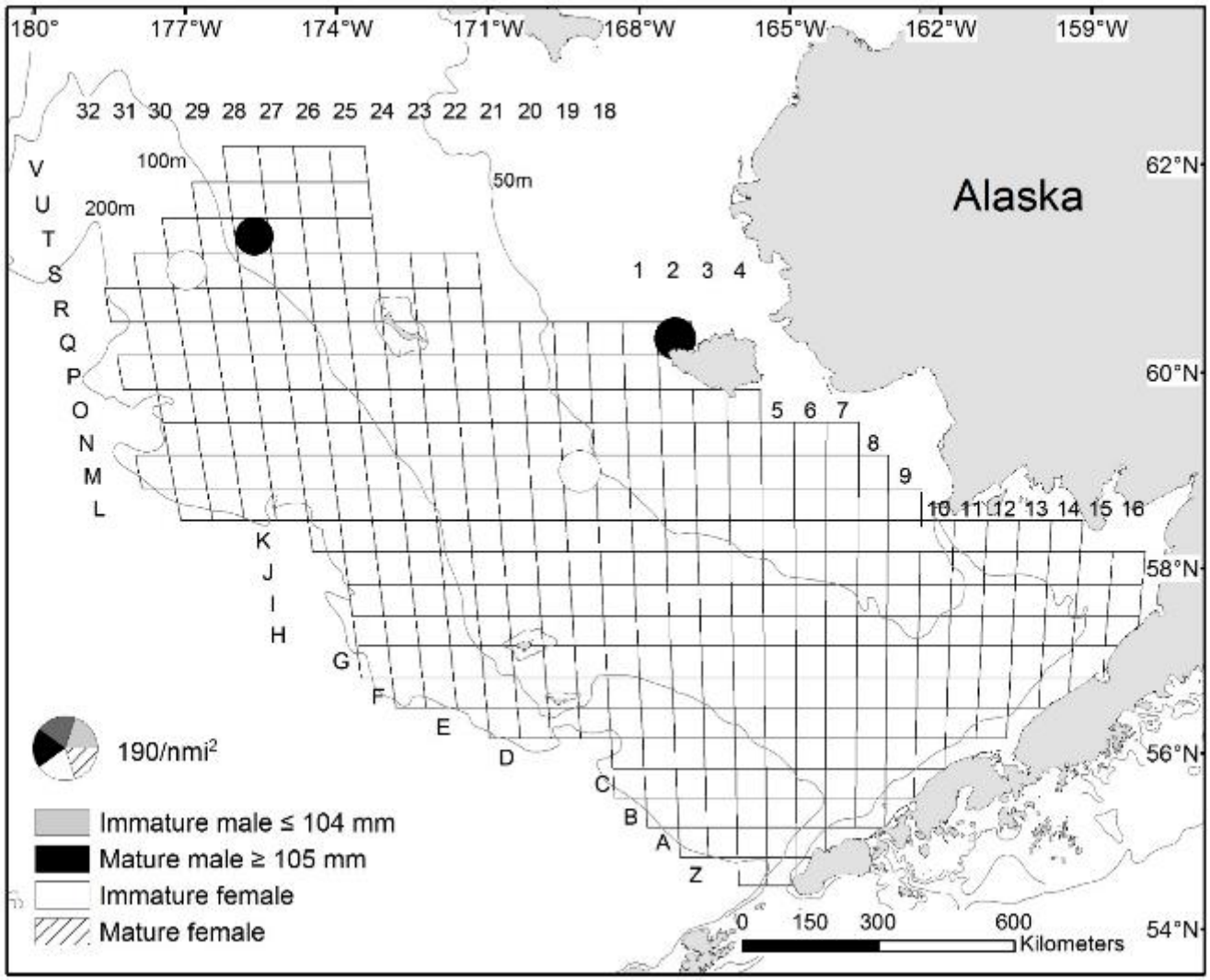

Figure 81. -- Total density (number nmi^{-2}) and percentage of male and female blue king crab (*Paralithodes platypus*) size and maturity categories at stations sampled outside of the Pribilof District and St. Matthew Island section of the Northern District in 2016.

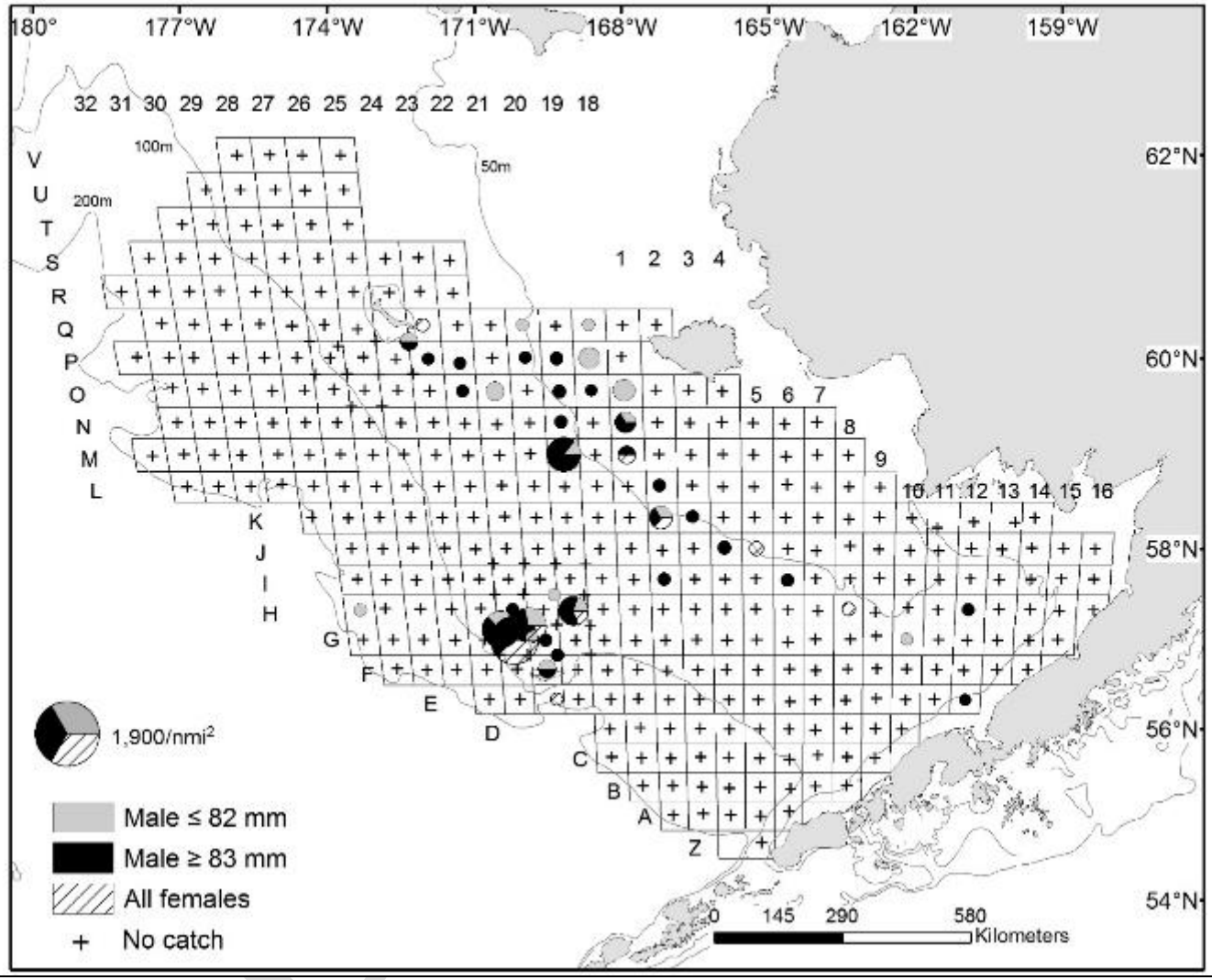

Figure 82. -- Total density (number nmi^{-2}) and percentage of male and female hair crab (*Erimacrus isenbeckii*) size categories at each station sampled in 2016.

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	A-02	A-03	A-04	A-05	A-06	B-01	B-02	B-03	B-04	B-05	B-06
Start Date	6/19/2016	6/19/2016	6/19/2016	6/15/2016	6/15/2016	6/22/2016	6/22/2016	6/20/2016	6/19/2016	6/16/2016	6/15/2016
Duration (hour)	0.52	0.51	0.52	0.5	0.52	0.5	0.5	0.52	0.5	0.54	0.5
Distance Fished (km)	2.89	2.84	2.81	2.8	2.86	2.75	2.75	2.9	2.82	2.97	2.75
Mid-Latitude (ºN)	55.01	55.02	55.01	54.99	55.05	55.34	55.35	55.33	55.32	55.33	55.31
Mid-Longitude (ºW)	-166.94	-166.33	-165.76	-165.15	-164.58	-167.56	-166.95	-166.35	-165.79	-165.17	-164.55
Bottom Depth (m)	155	142	130	111	64	149	139	132	121	111	102
Bottom Temperature (ºC)	4.7	4.8	4.5	5.1	6.7	4.6	4.7	4.7	4.9	5	5.5
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	5,254	5,580	1,955	825	77	8,555	1,908	1,876	808	873	745
Mature males	920	2,286	226	675	0	342	273	1,675	606	671	1,416
Legal	394	1,815	150	300	0	137	136	1,608	202	470	969
Immature females	4,006	1,691	827	225	0	11,156	2,044	1,005	135	67	0
Mature females	4,400	8,575	75	75	0	3,354	2,044	1,742	673	67	75
Total weight (kg)	23.15	54.00	4.46	7.64	0.01	20.08	10.94	22.99	9.56	10.67	17.02
Opilio Tanner Crab											
Immature males	0	0	0	0	0	68	68	0	0	0	298
Mature males	0	67	0	75	77	137	68	0	0	269	2,460
Legal	0	67	0	75	77	205	68	0	0	269	2,758
Immature females	0	0	0	0	0	68	204	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	522
Total weight (kg)	0.00	0.62	0.00	0.41	0.42	1.63	0.81	0.00	0.00	2.99	20.89
Hybrid Tanner Crab											
Immature males	0	67	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	134	149
Immature females	0	0	75	0	0	205	0	0	0	0	0
Mature females	0	67	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.38	0.03	0.00	0.00	0.14	0.00	0.00	0.00	1.61	1.61

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	B-07	B-08	C-01	C-02	C-03	C-04	C-05	C-06	C-07	C-08	C-09
Start Date	6/15/2016	6/6/2016	6/23/2016	6/22/2016	6/20/2016	6/19/2016	6/16/2016	6/14/2016	6/14/2016	6/6/2016	6/5/2016
Duration (hour)	0.51	0.51	0.51	0.49	0.52	0.5	0.56	0.46	0.5	0.51	0.52
Distance Fished (km)	2.82	2.78	2.77	2.72	2.97	2.79	3.1	2.55	2.82	2.77	2.99
Mid-Latitude (ºN)	55.34	55.35	55.67	55.66	55.67	55.67	55.66	55.65	55.7	55.68	55.67
Mid-Longitude (ºW)	-164.04	-163.4	-167.58	-166.99	-166.38	-165.81	-165.18	-164.57	-163.99	-163.39	-162.83
Bottom Depth (m)	80	55	136	135	126	117	108	97	94	82	51
Bottom Temperature (ºC)	6.3	6.1	4.6	4.7	4.8	5	5.3	5.6	4.8	5	5.6
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	76
Mature males	0	709	0	0	0	0	0	0	148	149	0
Legal	0	709	0	0	0	0	0	0	148	149	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	1,891	0	0	0	0	0	0	0	0	305
Total weight (kg)	0.00	79.88	0.00	0.00	0.00	0.00	0.00	0.00	8.50	7.06	10.04
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	0	946	1,226	549	1,153	401	1,786	486	886	223	17,131
Mature males	73	709	68	0	704	802	1,594	1,216	1,698	446	4,873
Legal	73	630	68	0	512	668	1,148	972	886	297	1,751
Immature females	0	79	136	481	192	134	383	324	74	0	305
Mature females	0	0	136	481	1,345	1,136	3,826	0	74	0	1,066
Total weight (kg)	0.90	9.71	3.14	2.51	11.92	14.21	35.20	12.65	18.41	5.54	94.70
Opilio Tanner Crab											
Immature males	0	0	68	0	0	0	64	81	74	0	0
Mature males	0	0	0	0	128	67	383	81	74	0	0
Legal	0	0	0	0	128	67	446	162	148	0	0
Immature females	0	0	68	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	128	0	191	0	0	0	0
Total weight (kg)	0.00	0.00	0.05	0.00	1.41	0.94	4.11	0.71	0.91	0.00	0.00
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	243	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.90	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	C-18	D-01	D-02	D-03	D-04	D-05	D-06	D-07	D-08	D-09	D-10
Start Date	6/23/2016	6/23/2016	6/22/2016	6/20/2016	6/15/2016	6/16/2016	6/13/2016	6/13/2016	6/6/2016	6/5/2016	5/31/2016
Duration (hour)	0.49	0.5	0.51	0.51	0.55	0.54	0.51	0.52	0.53	0.54	0.55
Distance Fished (km)	2.68	2.82	2.85	2.76	2.9	2.95	2.8	2.88	2.97	3.11	3.05
Mid-Latitude (ºN)	55.68	56.01	56	56	56	56	55.99	55.99	56.01	56	56
Mid-Longitude (ºW)	-168.19	-167.62	-167.01	-166.39	-165.79	-165.17	-164.58	-164.04	-163.4	-162.82	-162.28
Bottom Depth (m)	136	132	134	124	108	96	93	91	89	77	73
Bottom Temperature (ºC)	4.3	4.7	4.7	4.8	5.1	4.7	4.7	4.7	4.7	4.7	5.2
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	137	536	0
Mature males	0	0	0	0	0	0	71	71	273	1,140	268
Legal	0	0	0	0	0	0	71	71	205	1,073	268
Immature females	0	0	0	0	0	0	0	0	205	67	0
Mature females	0	0	0	0	0	0	0	71	137	4,492	268
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	4.58	5.66	17.52	160.38	20.38
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	707	132	327	2,257	764	969	1,142	781	0	134	469
Mature males	566	132	458	2,667	2,431	4,012	4,284	2,059	478	1,475	737
Legal	353	132	393	1,984	1,944	2,767	2,856	1,491	410	1,006	335
Immature females	212	66	131	479	208	0	71	0	0	0	0
Mature females	141	0	131	547	69	2,629	2,214	71	342	335	201
Total weight (kg)	5.63	1.44	5.21	24.40	25.51	50.50	46.94	23.07	6.29	17.02	10.70
Opilio Tanner Crab											
Immature males	0	0	0	0	278	208	0	0	0	0	0
Mature males	0	331	65	410	5,278	1,453	214	71	68	0	0
Legal	0	331	65	410	5,417	1,591	214	71	68	0	0
Immature females	0	0	0	68	0	0	0	0	0	0	0
Mature females	0	1,654	2,030	68	73,050	346	0	0	0	0	0
Total weight (kg)	0.00	6.30	5.32	4.28	170.11	16.14	1.90	0.78	0.46	0.00	0.00
Hybrid Tanner Crab											
Immature males	0	0	0	0	208	0	0	0	0	0	0
Mature males	0	0	0	68	1,944	484	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	68	2,778	138	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.66	23.04	4.98	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	D-18	E-01	E-02	E-03	E-04	E-05	E-06	E-07	E-08	E-09	E-10
Start Date	6/23/2016	6/26/2016	6/24/2016	6/20/2016	6/15/2016	6/15/2016	6/13/2016	6/13/2016	6/6/2016	6/5/2016	5/31/2016
Duration (hour)	0.51	0.52	0.49	0.48	0.54	0.52	0.51	0.51	0.52	0.53	0.53
Distance Fished (km)	2.75	2.78	2.71	2.54	2.96	2.9	2.8	2.82	2.89	2.99	2.91
Mid-Latitude (ºN)	55.99	56.34	56.33	56.34	56.33	56.33	56.31	56.33	56.32	56.35	56.33
Mid-Longitude (ºW)	-168.23	-167.65	-167.03	-166.41	-165.8	-165.21	-164.56	-164.04	-163.42	-162.8	-162.2
Bottom Depth (m)	150	129	114	104	91	86	87	86	84	79	77
Bottom Temperature (ºC)	4.4	4.7	4.9	4.9	4.7	4.6	4.7	4.7	4.7	4.7	4.9
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	137
Mature males	0	0	0	0	0	0	0	287	238	276	342
Legal	0	0	0	0	0	0	0	215	238	276	274
Immature females	0	0	0	0	0	0	0	0	0	0	137
Mature females	0	0	0	0	0	0	0	574	79	621	1,301
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.70	10.52	26.64	39.78
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	773	69	631	740	419	1,759	588	1,148	317	276	137
Mature males	773	482	2,173	3,370	1,048	2,955	2,133	2,870	2,138	1,587	1,369
Legal	562	413	2,103	3,123	769	2,111	1,691	2,081	1,425	1,311	1,232
Immature females	562	0	70	82	0	0	74	0	0	0	0
Mature females	421	0	1,542	904	140	2,955	0	215	317	0	0
Total weight (kg)	8.93	4.62	26.68	30.10	12.24	42.90	23.38	33.37	21.24	17.94	17.56
Opilio Tanner Crab											
Immature males	843	413	841	164	0	0	0	72	0	0	0
Mature males	492	964	421	740	769	352	515	144	0	0	0
Legal	1,053	1,309	981	740	769	352	515	144	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	6,602	0	21,310	0	0	0	0	0	0	0	0
Total weight (kg)	17.24	9.96	40.56	6.51	6.99	3.55	5.06	1.42	0.00	0.00	0.00
Hybrid Tanner Crab											
Immature males	0	69	70	0	0	0	0	0	0	0	0
Mature males	0	69	70	164	140	211	0	287	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	1,615	0	4,556	0	0	0	147	72	0	0	0
Total weight (kg)	2.88	0.71	8.19	2.53	1.00	2.81	0.36	2.87	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	E-11	E-12	E-18	E-19	E-20	E-21	E-22	F-01	F-02	F-03	F-04
Start Date	5/31/2016	5/31/2016	6/26/2016	6/26/2016	6/26/2016	7/5/2016	7/5/2016	6/26/2016	6/24/2016	6/21/2016	6/14/2016
Duration (hour)	0.53	0.55	0.51	0.53	0.53	0.5	0.51	0.51	0.51	0.52	0.54
Distance Fished (km)	2.98	3.08	2.76	2.97	2.87	2.7	2.86	2.77	2.82	2.84	3.03
Mid-Latitude (ºN)	56.33	56.33	56.33	56.33	56.34	56.33	56.34	56.67	56.66	56.67	56.67
Mid-Longitude (ºW)	-161.61	-160.99	-168.21	-168.87	-169.32	-170.07	-170.69	-167.67	-167.06	-166.44	-165.85
Bottom Depth (m)	63	54	151	129	137	109	121	101	96	85	78
Bottom Temperature (ºC)	5.4	6.1	4.6	4.7	4.7	4.9	4.6	4.8	4.8	4.6	4.5
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	66	0	0	0	0	0	0	0	0	0
Legal	0	66	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	977	133	0	0	0	0	0	0	0	0	0
Total weight (kg)	17.42	5.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	140	332	800	339	204	1,666	273	142	272	153	1,014
Mature males	558	266	4,217	1,492	0	797	0	2,420	1,156	2,367	869
Legal	488	199	3,854	1,492	0	507	0	2,277	1,156	2,138	652
Immature females	0	0	364	882	272	507	137	0	0	0	0
Mature females	70	66	3,854	2,306	0	869	0	71	408	0	217
Total weight (kg)	8.56	4.51	43.40	18.49	0.05	14.27	0.63	22.36	12.90	20.56	12.64
Opilio Tanner Crab											
Immature males	0	0	3,199	1,085	0	0	0	1,352	204	76	145
Mature males	0	0	1,382	407	0	0	0	1,637	136	382	435
Legal	0	0	2,690	746	0	0	0	2,775	340	458	435
Immature females	0	0	0	0	0	145	0	0	68	0	0
Mature females	0	0	28,431	46,824	136	0	205	1,921	68	0	217
Total weight (kg)	0.00	0.00	58.26	75.84	0.18	0.12	0.16	22.10	2.45	3.28	3.53
Hybrid Tanner Crab											
Immature males	0	0	145	0	0	0	0	142	0	0	0
Mature males	0	0	654	136	0	0	0	285	0	0	72
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	2,981	203	0	0	0	356	0	0	0
Total weight (kg)	0.00	0.00	9.86	1.18	0.00	0.00	0.00	3.65	0.00	0.00	0.50

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	F-05	F-06	F-07	F-08	F-09	F-10	F-11	F-12	F-13	F-14	F-18
Start Date	6/15/2016	6/12/2016	6/13/2016	6/7/2016	6/5/2016	6/4/2016	5/31/2016	5/31/2016	5/31/2016	6/1/2016	6/26/2016
Duration (hour)	0.53	0.5	0.51	0.53	0.51	0.52	0.54	0.54	0.54	0.53	0.54
Distance Fished (km)	2.9	2.78	2.86	2.97	2.9	2.92	3.04	2.87	3	2.94	2.9
Mid-Latitude (ºN)	56.66	56.68	56.66	56.67	56.68	56.68	56.67	56.66	56.67	56.67	56.66
Mid-Longitude (ºW)	-165.22	-164.57	-164.03	-163.38	-162.79	-162.18	-161.57	-161.01	-160.34	-159.72	-168.28
Bottom Depth (m)	76	75	75	75	72	69	90	66	59	36	107
Bottom Temperature (ºC)	4.5	4.7	4.8	4.7	4.9	5	5	5.4	5.7	6.6	4.9
Red King Crab											
Immature males	0	0	0	0	150	672	72	560	0	0	0
Mature males	1,020	0	214	545	526	971	358	630	0	0	0
Legal	947	0	214	409	376	822	358	350	0	0	0
Immature females	0	0	0	0	0	224	0	140	0	0	0
Mature females	0	0	0	136	2,028	10,307	3,147	2,031	68	0	0
Total weight (kg)	44.91	0.00	11.08	25.46	63.80	217.76	65.36	60.68	1.28	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	1,603	661	499	409	451	224	0	70	272	0	416
Mature males	1,749	661	855	1,294	1,052	598	3,147	280	136	0	2,290
Legal	947	294	712	681	676	598	2,933	280	136	0	1,804
Immature females	219	0	0	0	0	0	0	0	0	0	0
Mature females	219	587	142	68	0	0	72	280	68	0	0
Total weight (kg)	22.19	8.88	10.28	14.06	8.86	8.10	38.13	4.78	2.45	0.00	20.14
Opilio Tanner Crab											
Immature males	73	0	71	0	0	0	0	0	0	0	2,082
Mature males	73	0	142	0	0	0	0	0	0	0	1,804
Legal	146	0	142	0	0	0	0	0	0	0	2,984
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.88	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.50
Hybrid Tanner Crab											
Immature males	0	73	0	0	0	0	0	0	0	0	0
Mature males	291	0	71	68	0	0	0	0	0	0	416
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	2.13	0.22	0.53	1.21	0.00	0.00	0.00	0.00	0.00	0.00	3.65

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	F-19	F-20	F-21	F-22	F-23	F-24	F-25	G-01	G-02	G-03	G-04
Start Date	6/27/2016	6/27/2016	7/1/2016	7/1/2016	7/5/2016	7/10/2016	7/26/2016	6/26/2016	6/24/2016	6/21/2016	6/14/2016
Duration (hour)	0.5	0.53	0.5	0.52	0.52	0.52	0.49	0.51	0.51	0.52	0.53
Distance Fished (km)	2.75	2.81	2.77	2.9	2.78	2.87	2.73	2.8	2.76	2.8	2.89
Mid-Latitude (ºN)	56.67	56.68	56.67	56.67	56.67	56.67	56.68	56.99	57	57	57
Mid-Longitude (ºW)	-168.89	-169.51	-170.12	-170.74	-171.35	-171.97	-172.57	-167.71	-167.1	-166.46	-165.84
Bottom Depth (m)	101	80	97	114	120	127	135	78	74	74	72
Bottom Temperature (ºC)	4.8	6.1	5.6	4.8	4.8	4.7	4.7	4.5	4.4	4.2	4.2
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	385	2,286	4,003	4,583	3,686	19,393	365	1,268	302	231	691
Mature males	6,314	5,181	8,600	1,528	142	754	0	2,015	907	922	154
Legal	5,929	4,495	7,562	1,389	142	617	0	1,567	831	768	77
Immature females	154	610	1,557	5,138	0	12,338	73	149	76	0	0
Mature females	5,467	457	3,559	139	0	4,250	0	224	0	0	0
Total weight (kg)	71.66	49.59	108.84	20.00	2.61	25.87	0.53	18.12	8.73	7.38	4.22
Opilio Tanner Crab											
Immature males	1,155	0	0	139	3,531	0	0	224	76	77	0
Mature males	462	0	0	0	1,917	0	0	448	151	0	77
Legal	770	0	0	69	3,279	0	0	597	227	0	77
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	53,143	0	0	0	98,319	0	0	0	0	0	0
Total weight (kg)	70.52	0.00	0.00	0.44	141.86	0.00	0.00	5.88	1.61	0.13	0.39
Hybrid Tanner Crab											
Immature males	231	76	74	0	0	0	0	0	0	0	0
Mature males	924	0	0	0	213	0	0	224	0	0	77
Immature females	0	0	74	0	0	0	0	0	0	0	0
Mature females	11,751	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	24.06	0.24	0.26	0.00	1.45	0.00	0.00	1.64	0.00	0.00	0.55

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	G-05	G-06	G-07	G-08	G-09	G-10	G-11	G-12	G-13	G-14	G-15
Start Date	6/14/2016	6/12/2016	6/12/2016	6/7/2016	6/7/2016	6/4/2016	6/1/2016	6/1/2016	6/1/2016	6/1/2016	6/1/2016
Duration (hour)	0.54	0.5	0.5	0.51	0.52	0.54	0.52	0.52	0.52	0.55	0.54
Distance Fished (km)	2.83	2.77	2.8	2.85	2.89	3.08	2.93	2.86	2.84	2.98	2.79
Mid-Latitude (ºN)	57	56.98	57.01	57.01	57.04	57.01	57	57	56.99	57	57
Mid-Longitude (ºW)	-165.23	-164.6	-164.04	-163.33	-162.8	-162.18	-161.53	-160.94	-160.33	-159.68	-159.1
Bottom Depth (m)	70	70	68	67	61	58	69	66	62	56	30
Bottom Temperature (ºC)	4.6	4.8	4.7	4.9	5.3	5.6	5.2	5.4	5.5	5.8	7.5
Red King Crab											
Immature males	0	0	0	149	72	139	70	147	77	0	0
Mature males	0	0	311	446	290	558	840	737	77	0	0
Legal	0	0	233	372	217	418	840	590	77	0	0
Immature females	0	0	0	0	0	0	70	74	77	0	0
Mature females	80	0	0	74	0	1,115	7,276	2,432	617	70	0
Total weight (kg)	1.35	0.00	11.48	23.00	11.34	46.72	171.28	76.86	13.24	1.22	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	1,356	783	1,167	595	217	349	280	147	231	70	408
Mature males	399	1,332	389	446	72	139	700	516	308	280	82
Legal	160	940	233	149	72	70	630	295	231	280	0
Immature females	0	0	78	74	145	70	0	0	0	0	0
Mature females	0	0	233	0	0	0	0	0	0	0	0
Total weight (kg)	7.50	13.20	7.56	6.28	1.41	2.41	8.66	6.14	3.54	2.71	2.42
Opilio Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	80	0	156	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.34	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	G-18	G-19	G-20	G-21	G-22	G-23	G-24	G-25	G-26	GF1918	GF2019
Start Date	6/26/2016	6/27/2016	6/27/2016	7/1/2016	7/1/2016	7/10/2016	7/10/2016	7/26/2016	7/26/2016	6/27/2016	6/27/2016
Duration (hour)	0.53	0.52	0.52	0.51	0.53	0.51	0.5	0.52	0.5	0.51	0.51
Distance Fished (km)	2.88	2.82	2.85	2.78	2.9	2.84	2.72	2.78	2.74	2.81	2.83
Mid-Latitude (ºN)	56.99	56.99	57	57	57	56.99	57	57	57	56.84	56.83
Mid-Longitude (ºW)	-168.34	-168.93	-169.55	-170.18	-170.78	-171.38	-172.03	-172.65	-173.26	-168.63	-169.3
Bottom Depth (m)	81	80	61	69	95	110	117	122	143	97	80
Bottom Temperature (ºC)	4.4	4.7	5	6.1	5.4	4.9	4.8	4.8	4.4	4.6	4.9
Red King Crab											
Immature males	0	0	151	0	0	0	0	0	0	0	0
Mature males	0	0	0	562	0	0	0	0	0	0	0
Legal	0	0	0	562	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	1,960	160	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	63.98	44.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	80	0	0	0	0	0	0	0
Mature females	0	73	0	80	0	0	0	0	0	0	153
Total weight (kg)	0.00	1.98	0.00	1.32	0.00	0.00	0.00	0.00	0.00	0.00	3.81
Bairdi Tanner Crab											
Immature males	4,153	511	8,142	13,240	11,852	954	149	811	214	581	230
Mature males	6,474	3,944	1,960	6,259	2,918	545	74	0	0	7,402	3,297
Legal	5,619	3,287	1,583	5,135	2,571	545	0	0	0	6,168	2,684
Immature females	216	0	3,619	1,926	7,867	1,090	447	738	143	73	0
Mature females	1,582	0	1,432	2,808	1,484	1,022	74	0	0	3,628	0
Total weight (kg)	71.47	30.92	23.08	84.66	53.37	9.02	0.81	0.50	0.09	69.24	28.32
Opilio Tanner Crab											
Immature males	2,230	1,388	75	0	139	6,131	1,861	74	0	10,740	153
Mature males	2,445	1,169	75	0	69	2,861	1,638	74	0	4,572	0
Legal	4,171	2,118	75	0	139	6,199	2,829	74	0	10,014	77
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	730	0	0	0	58,983	26,068	74	0	72,087	153
Total weight (kg)	26.34	14.53	0.81	0.00	0.47	102.22	41.40	1.00	0.00	135.72	0.59
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	145	0
Mature males	144	0	0	0	0	136	0	0	0	435	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	681	0	0	0	1,959	0
Total weight (kg)	0.93	0.00	0.00	0.00	0.00	2.06	0.00	0.00	0.00	6.06	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	GF2120	GF2221	H-01	H-02	H-03	H-04	H-05	H-06	H-07	H-08	H-09
Start Date	7/1/2016	7/1/2016	6/25/2016	6/24/2016	6/21/2016	6/14/2016	6/14/2016	6/11/2016	6/12/2016	6/7/2016	6/7/2016
Duration (hour)	0.52	0.52	0.5	0.5	0.51	0.52	0.52	0.51	0.51	0.51	0.51
Distance Fished (km)	2.96	2.88	2.73	2.72	2.77	2.72	2.75	2.9	2.8	2.84	2.94
Mid-Latitude (ºN)	56.83	56.83	57.33	57.33	57.33	57.34	57.34	57.33	57.32	57.34	57.3
Mid-Longitude (ºW)	-169.9	-170.48	-167.73	-167.14	-166.48	-165.87	-165.25	-164.59	-164	-163.37	-162.82
Bottom Depth (m)	73	101	73	70	70	68	66	66	62	52	50
Bottom Temperature (ºC)	6.5	5.1	4.3	4	4.2	4.3	4.8	4.8	4.9	5.7	5.9
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	177	0	151	310	294
Legal	0	0	0	0	0	0	177	0	151	233	220
Immature females	0	0	0	0	0	0	0	0	0	0	73
Mature females	0	0	0	0	0	0	0	73	0	155	73
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	6.73	0.98	4.46	13.48	13.32
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	887	15,571	390	544	0	254	620	439	452	78	147
Mature males	819	2,660	156	466	322	339	266	293	0	233	73
Legal	682	2,319	78	311	322	170	177	73	0	155	73
Immature females	205	11,651	0	0	0	0	0	0	0	0	0
Mature females	68	2,183	0	78	0	0	0	0	0	0	0
Total weight (kg)	9.87	53.47	1.67	4.25	1.96	3.36	4.36	3.54	1.72	2.48	1.32
Opilio Tanner Crab											
Immature males	0	136	78	233	402	0	0	0	0	0	0
Mature males	0	68	156	0	80	85	0	0	0	0	0
Legal	0	136	156	233	322	85	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	75	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.81	1.64	0.86	1.57	0.84	0.00	0.00	0.01	0.00	0.00
Hybrid Tanner Crab											
Immature males	0	0	0	233	0	0	0	0	0	0	0
Mature males	0	68	78	0	0	0	0	0	75	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	409	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	1.22	0.36	0.90	0.00	0.00	0.00	0.00	0.28	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	H-10	H-11	H-12	H-13	H-14	H-15	H-16	H-18	H-19	H-20	H-21
Start Date	6/4/2016	6/3/2016	6/3/2016	6/1/2016	6/2/2016	6/1/2016	6/2/2016	6/25/2016	6/27/2016	6/27/2016	6/29/2016
Duration (hour)	0.53	0.54	0.53	0.53	0.54	0.53	0.49	0.53	0.5	0.52	0.52
Distance Fished (km)	2.95	3.01	2.92	2.95	3.04	2.89	2.83	2.85	2.76	2.8	2.81
Mid-Latitude (ºN)	57.36	57.33	57.34	57.33	57.34	57.32	57.33	57.33	57.32	57.33	57.34
Mid-Longitude (ºW)	-162.15	-161.54	-160.93	-160.3	-159.67	-159.06	-158.37	-168.37	-168.98	-169.58	-170.22
Bottom Depth (m)	51	55	64	61	57	47	30	74	70	63	57
Bottom Temperature (ºC)	6	5.8	5.7	5.8	6.1	6.4	7.3	4.6	4.8	4.7	7.2
Red King Crab											
Immature males	74	282	76	74	0	0	0	0	0	627	0
Mature males	811	704	763	148	70	0	0	0	0	706	0
Legal	590	563	458	148	0	0	0	0	0	392	0
Immature females	0	0	76	0	0	0	84	0	0	0	0
Mature females	221	2,323	4,046	519	0	78	0	0	0	2,117	0
Total weight (kg)	35.70	78.14	101.12	19.20	1.52	0.96	0.04	0.00	0.00	69.81	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	158	0	0
Mature males	0	0	0	0	0	0	0	0	79	0	0
Legal	0	0	0	0	0	0	0	0	79	0	0
Immature females	0	0	0	0	0	0	0	0	158	0	0
Mature females	0	0	0	0	0	0	0	0	712	78	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.28	1.44	0.00
Bairdi Tanner Crab											
Immature males	147	141	382	222	140	156	0	366	2,611	470	74
Mature males	147	352	458	667	349	311	0	2,417	9,573	314	149
Legal	147	282	458	444	210	311	0	1,612	8,228	314	149
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	74	0	0	0	0	0	0	0	79	0	0
Total weight (kg)	2.34	3.48	6.12	4.82	5.02	3.67	0.00	18.76	73.23	4.68	1.10
Opilio Tanner Crab											
Immature males	0	0	0	0	0	0	0	513	0	157	0
Mature males	0	0	0	0	0	0	0	147	79	157	0
Legal	0	0	0	0	0	0	0	293	79	235	0
Immature females	74	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.90	0.41	2.39	0.00
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	73	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	H-22	H-23	H-24	H-25	H-26	HG1918	HG2019	HG2120	HG2221	I-01	I-02
Start Date	6/29/2016	7/10/2016	7/10/2016	7/26/2016	7/25/2016	6/27/2016	6/27/2016	7/1/2016	7/1/2016	6/25/2016	6/25/2016
Duration (hour)	0.51	0.51	0.51	0.53	0.48	0.52	0.54	0.52	0.51	0.5	0.5
Distance Fished (km)	2.77	2.85	2.78	2.95	2.6	2.86	2.85	2.88	2.86	2.76	2.74
Mid-Latitude (ºN)	57.35	57.34	57.34	57.35	57.33	57.16	57.17	57.16	57.11	57.66	57.67
Mid-Longitude (ºW)	-170.86	-171.46	-172.1	-172.81	-173.33	-168.63	-169.32	-169.89	-170.46	-167.74	-167.13
Bottom Depth (m)	84	102	110	117	121	77	73	49	50	69	68
Bottom Temperature (ºC)	5.5	4.8	4.7	4.7	4.7	4.6	4.8	6.8	7.6	4.7	4.4
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	73	0	0	0	0
Legal	0	0	0	0	0	0	73	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	9.93	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	72	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	1.68	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	354	335	74	212	770	650	2,650	397	872	244	308
Mature males	4,817	7,642	0	71	0	3,105	13,104	556	238	893	847
Legal	4,676	7,039	0	0	0	2,744	9,717	238	238	487	847
Immature females	0	268	74	283	77	217	73	159	634	0	0
Mature females	2,196	737	0	0	77	0	0	0	0	81	0
Total weight (kg)	65.02	83.62	0.27	0.47	2.25	27.33	70.58	4.22	3.28	5.92	8.08
Opilio Tanner Crab											
Immature males	4,534	2,078	4,336	1,627	0	217	5,104	0	0	1,218	308
Mature males	425	1,073	6,417	2,193	0	72	2,042	0	0	244	154
Legal	1,700	2,413	9,712	3,820	0	144	5,104	0	0	731	308
Immature females	0	0	0	71	0	0	0	0	0	0	0
Mature females	5,384	1,006	3,699	637	0	0	583	0	0	0	0
Total weight (kg)	34.33	17.64	68.97	25.12	0.00	1.41	28.83	0.00	0.00	4.32	1.80
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	146	0	0	244	77
Mature males	213	134	148	0	0	0	656	0	0	244	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	425	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	3.31	1.44	1.50	0.00	0.00	0.00	4.60	0.00	0.00	1.75	0.22

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	I-03	I-04	I-05	I-06	I-07	I-08	I-09	I-10	I-11	I-12	I-13
Start Date	6/21/2016	6/13/2016	6/13/2016	6/11/2016	6/11/2016	6/8/2016	6/8/2016	6/4/2016	6/3/2016	6/3/2016	6/2/2016
Duration (hour)	0.51	0.52	0.52	0.5	0.51	0.51	0.51	0.53	0.52	0.54	0.55
Distance Fished (km)	2.75	2.89	2.76	2.79	2.79	2.81	2.91	2.95	2.88	3.03	3.12
Mid-Latitude (ºN)	57.67	57.66	57.67	57.66	57.67	57.67	57.68	57.66	57.66	57.67	57.66
Mid-Longitude (ºW)	-166.5	-165.88	-165.25	-164.62	-164.03	-163.33	-162.74	-162.12	-161.52	-160.88	-160.29
Bottom Depth (m)	66	64	60	55	52	47	45	48	52	57	55
Bottom Temperature (ºC)	4.6	4.7	4.9	5.5	6	6.7	7	6.5	6	5.9	6
Red King Crab											
Immature males	0	0	0	0	0	81	0	76	74	140	0
Mature males	0	0	0	156	156	162	235	914	967	559	74
Legal	0	0	0	78	78	162	157	762	521	349	74
Immature females	0	0	0	0	0	0	0	76	0	0	0
Mature females	0	0	82	78	78	162	392	229	967	978	811
Total weight (kg)	0.00	0.00	1.09	7.16	6.02	10.60	14.52	38.70	51.70	37.10	17.02
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	236	390	653	467	389	0	157	0	446	0	74
Mature males	472	390	653	156	78	162	0	76	149	70	442
Legal	315	312	653	156	0	162	0	76	149	70	295
Immature females	0	0	0	78	0	0	0	0	0	0	0
Mature females	0	0	82	0	0	0	0	0	0	0	0
Total weight (kg)	3.84	4.74	8.34	2.30	2.14	1.74	0.78	0.66	3.12	0.72	4.70
Opilio Tanner Crab											
Immature males	79	0	82	0	0	81	0	0	0	0	0
Mature males	157	0	0	0	0	0	0	0	0	0	0
Legal	157	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	1.39	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hybrid Tanner Crab											
Immature males	0	0	163	78	0	0	0	0	0	0	0
Mature males	0	156	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.86	0.52	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	I-14	I-15	I-16	I-18	I-19	I-20	I-21	I-22	I-23	I-24	I-25
Start Date	6/2/2016	6/2/2016	6/2/2016	6/25/2016	6/28/2016	6/28/2016	6/29/2016	6/29/2016	7/10/2016	7/10/2016	7/26/2016
Duration (hour)	0.53	0.54	0.54	0.53	0.51	0.53	0.35	0.45	0.51	0.36	0.53
Distance Fished (km)	2.94	2.85	2.94	2.89	2.81	2.89	1.92	2.36	2.8	1.96	2.92
Mid-Latitude (ºN)	57.67	57.67	57.67	57.67	57.67	57.67	57.67	57.67	57.67	57.66	57.66
Mid-Longitude (ºW)	-159.64	-159.03	-158.36	-168.4	-169.04	-169.66	-170.31	-170.89	-171.53	-172.18	-172.79
Bottom Depth (m)	51	44	37	71	69	70	73	85	100	109	119
Bottom Temperature (ºC)	6.4	6.6	6.9	4.4	4.5	4.7	4.6	4.5	4.6	4.4	4.6
Red King Crab											
Immature males	79	74	0	0	0	0	0	0	0	0	0
Mature males	79	0	0	0	0	0	107	0	0	0	0
Legal	79	0	0	0	0	0	107	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	4.04	0.12	0.00	0.00	0.00	0.00	1.65	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	72	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	73	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.52	0.00	0.93	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	238	74	313	293	784	793	642	1,571	984	104	204
Mature males	159	0	0	951	549	3,387	321	2,150	3,163	0	0
Legal	79	0	0	951	314	2,522	214	1,654	2,601	0	0
Immature females	0	0	0	0	0	0	107	0	562	0	204
Mature females	0	0	0	0	0	72	0	579	12,230	0	0
Total weight (kg)	2.58	0.20	1.23	9.89	5.28	29.20	3.05	18.75	61.80	0.01	0.07
Opilio Tanner Crab											
Immature males	0	0	0	146	9,726	9,441	642	2,068	1,968	3,747	1,090
Mature males	0	0	0	439	235	793	0	248	422	1,665	204
Legal	0	0	0	512	2,432	5,189	0	992	1,265	3,123	340
Immature females	0	0	0	73	78	0	107	0	0	0	0
Mature females	0	0	0	0	78	0	0	83	914	60,012	58,249
Total weight (kg)	0.00	0.00	0.00	3.48	17.36	27.21	0.47	5.94	8.93	53.92	60.47
Hybrid Tanner Crab											
Immature males	0	0	0	0	471	0	0	0	70	0	0
Mature males	0	0	0	73	0	360	0	83	70	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	70	0	0
Total weight (kg)	0.00	0.00	0.00	0.64	0.76	2.21	0.00	0.47	0.65	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	I-26	IH1918	IH2019	IH2120	IH2221	J-01	J-02	J-03	J-04	J-05	J-06
Start Date	7/25/2016	6/28/2016	6/28/2016	6/29/2016	6/29/2016	6/25/2016	6/25/2016	6/21/2016	6/13/2016	6/13/2016	6/11/2016
Duration (hour)	0.51	0.5	0.53	0.51	0.54	0.52	0.51	0.52	0.55	0.52	0.51
Distance Fished (km)	2.75	2.72	2.9	2.8	2.89	2.9	2.72	2.91	2.89	2.72	2.8
Mid-Latitude (ºN)	57.67	57.49	57.5	57.5	57.5	58	57.98	58	58.01	58	57.99
Mid-Longitude (ºW)	-173.38	-168.75	-169.37	-170	-170.58	-167.8	-167.17	-166.53	-165.9	-165.25	-164.6
Bottom Depth (m)	146	71	70	68	74	67	64	61	56	51	45
Bottom Temperature (ºC)	4.2	4.7	4.9	4.6	5.3	4.6	4.8	4.9	5.4	6	6.9
Red King Crab											
Immature males	0	0	0	1,234	0	0	0	0	0	90	0
Mature males	0	0	0	3,932	0	0	0	0	81	359	79
Legal	0	0	0	3,007	0	0	0	0	0	179	0
Immature females	0	0	0	154	0	0	0	0	0	0	0
Mature females	0	0	0	771	0	0	0	74	731	179	79
Total weight (kg)	0.00	0.00	0.00	183.46	0.00	0.00	0.00	0.98	10.26	12.96	2.82
Blue King Crab											
Immature males	0	0	0	77	0	0	0	0	0	0	0
Mature males	0	0	0	77	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	77	0	0	0	0	0	0	0
Mature females	0	0	141	231	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	1.96	7.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	568	336	707	1,619	553	0	231	444	569	448	158
Mature males	0	1,344	4,031	6,785	5,877	147	2,465	444	325	179	237
Legal	0	1,008	3,324	5,629	5,808	147	2,234	370	162	90	158
Immature females	213	84	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	231	2,351	0	0	74	0	179	0
Total weight (kg)	0.93	10.42	36.52	61.23	72.56	1.12	19.48	4.45	4.19	3.15	2.86
Opilio Tanner Crab											
Immature males	0	3,275	71	1,619	69	3,613	462	148	0	0	0
Mature males	0	840	212	771	0	737	154	296	0	0	0
Legal	0	2,687	283	1,619	69	2,581	308	444	0	0	0
Immature females	0	0	0	0	69	0	0	0	0	0	0
Mature females	0	84	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	12.69	1.96	8.35	0.47	11.68	1.72	2.65	0.00	0.00	0.00
Hybrid Tanner Crab											
Immature males	0	0	0	0	138	74	154	0	0	0	0
Mature males	0	84	141	231	277	0	0	0	162	269	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	84	0	77	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.67	1.08	1.53	2.75	0.24	0.38	0.00	1.06	1.69	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	J-07	J-08	J-09	J-10	J-11	J-12	J-13	J-14	J-15	J-16	J-18
Start Date	6/11/2016	6/8/2016	6/8/2016	6/4/2016	6/3/2016	6/2/2016	6/2/2016	6/3/2016	6/3/2016	6/2/2016	6/25/2016
Duration (hour)	0.51	0.52	0.53	0.52	0.52	0.47	0.53	0.55	0.54	0.54	0.52
Distance Fished (km)	2.77	2.81	2.95	2.88	2.89	2.58	2.87	3.18	3	3.18	2.82
Mid-Latitude (ºN)	57.97	58.03	57.99	57.98	57.97	58	57.99	58.01	58	57.99	58
Mid-Longitude (ºW)	-164.02	-163.34	-162.75	-162.12	-161.53	-160.86	-160.23	-159.62	-158.97	-158.33	-168.43
Bottom Depth (m)	47	44	43	38	53	44	50	42	42	34	70
Bottom Temperature (ºC)	7.3	7.2	6.9	6.5	6.1	5.8	5.9	6.8	7.1	7.6	4.4
Red King Crab											
Immature males	0	0	0	167	454	180	6,094	0	565	0	0
Mature males	0	241	151	668	1,288	269	401	0	0	0	0
Legal	0	241	151	668	909	269	321	0	0	0	0
Immature females	0	0	0	84	151	90	6,896	68	494	0	0
Mature females	0	80	75	251	1,136	988	241	68	0	0	0
Total weight (kg)	0.00	8.18	7.08	30.44	69.96	24.00	48.14	1.27	2.28	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	155	241	75	0	151	449	80	68	0	571	1,406
Mature males	466	160	75	251	454	808	241	136	71	143	1,328
Legal	233	80	75	84	303	629	80	136	71	71	1,015
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	84	0	90	0	68	0	0	78
Total weight (kg)	3.72	2.58	0.88	1.99	4.70	8.24	2.02	2.04	0.39	3.16	12.51
Opilio Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	2,578
Mature males	0	0	0	0	0	0	0	0	0	0	781
Legal	0	0	0	0	0	0	0	0	0	0	1,875
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.92
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	78
Mature males	0	0	0	0	0	0	0	0	0	0	78
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	J-19	J-20	J-21	J-22	J-23	J-24	J-25	J-26	JI1918	JI2019	JI2120
Start Date	7/2/2016	7/2/2016	7/5/2016	7/11/2016	7/10/2016	7/25/2016	7/25/2016	7/25/2016	6/28/2016	6/28/2016	6/28/2016
Duration (hour)	0.5	0.53	0.51	0.51	0.51	0.52	0.52	0.5	0.5	0.5	0.53
Distance Fished (km)	2.73	2.83	2.84	2.77	2.82	2.86	2.91	2.74	2.79	2.77	2.86
Mid-Latitude (ºN)	58	57.99	58	57.99	58.01	58	57.99	58	57.83	57.84	57.84
Mid-Longitude (ºW)	-169.07	-169.7	-170.34	-170.97	-171.6	-172.24	-172.87	-173.5	-168.73	-169.34	-169.97
Bottom Depth (m)	70	71	74	87	98	105	109	118	71	66	72
Bottom Temperature (ºC)	4.3	4.6	4.1	3.6	3.4	3.9	4	4.4	4.1	4.6	4.3
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	77	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00
Bairdi Tanner Crab											
Immature males	1,399	883	878	922	962	854	487	72	4,323	2,314	214
Mature males	1,070	1,766	73	1,152	824	0	0	0	2,958	1,157	357
Legal	988	1,619	73	614	550	0	0	0	1,972	848	214
Immature females	0	0	0	230	344	285	695	145	76	0	143
Mature females	0	0	0	538	2,199	71	0	0	0	424	0
Total weight (kg)	12.02	17.05	3.24	9.39	11.52	1.13	0.20	0.09	35.33	14.46	2.99
Opilio Tanner Crab											
Immature males	8,888	6,329	19,396	1,843	13,948	142	1,764	2,532	13,651	325,426	35,036
Mature males	741	3,091	293	154	2,267	285	2,714	1,013	2,123	463	327
Legal	4,033	6,624	1,025	845	8,451	285	3,393	2,460	11,072	3,548	7,204
Immature females	82	0	4,538	77	0	142	0	0	0	50,525	0
Mature females	82	147	8,563	845	102,369	712	36,173	118,756	0	30,770	0
Total weight (kg)	20.31	35.39	41.18	5.75	148.06	2.84	63.37	98.36	46.84	365.40	65.06
Hybrid Tanner Crab											
Immature males	165	221	0	77	69	0	0	0	834	424	0
Mature males	247	442	73	77	69	0	0	0	531	212	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	2,405	0	0	1,085	76	0	0
Total weight (kg)	1.47	3.79	0.57	0.32	3.19	0.00	0.00	0.76	5.23	3.14	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	JI2221	K-01	K-02	K-03	K-04	K-05	K-06	K-07	K-08	K-09	K-10
Start Date	6/28/2016	6/24/2016	6/24/2016	6/22/2016	6/12/2016	6/12/2016	6/10/2016	6/10/2016	6/8/2016	6/5/2016	6/4/2016
Duration (hour)	0.53	0.53	0.52	0.52	0.53	0.53	0.51	0.52	0.51	0.54	0.54
Distance Fished (km)	2.9	2.91	2.72	2.9	3.01	2.78	2.89	2.92	2.85	3.01	3.03
Mid-Latitude (ºN)	57.83	58.33	58.34	58.35	58.34	58.34	58.33	58.33	58.32	58.34	58.32
Mid-Longitude (ºW)	-170.61	-167.83	-167.2	-166.55	-165.92	-165.28	-164.64	-163.99	-163.36	-162.73	-162.07
Bottom Depth (m)	78	60	52	47	44	45	45	43	37	33	46
Bottom Temperature (ºC)	3.8	4.8	5.5	6.3	6.4	6.7	7.1	7.6	7.6	7.4	6.9
Red King Crab											
Immature males	0	0	0	75	72	0	0	0	0	0	0
Mature males	0	0	80	75	215	77	0	71	0	0	0
Legal	0	0	80	0	72	77	0	71	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	161	226	72	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	5.00	6.12	7.30	2.16	0.00	2.04	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	276	435	241	226	358	307	146	143	357	169	72
Mature males	552	798	241	1,056	645	537	659	71	268	169	145
Legal	414	653	241	755	430	460	586	71	179	84	145
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	72
Total weight (kg)	5.28	6.86	2.28	7.55	6.98	5.72	6.38	1.68	2.94	1.81	1.84
Opilio Tanner Crab											
Immature males	207	290	80	75	0	0	0	0	0	0	0
Mature males	345	218	80	0	0	77	0	0	0	0	0
Legal	414	435	161	75	0	77	0	0	0	0	0
Immature females	0	73	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	2.23	1.76	0.77	0.18	0.00	0.36	0.00	0.00	0.00	0.00	0.00
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	153	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	1.15	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	K-11	K-12	K-13	K-14	K-18	K-19	K-20	K-21	K-22	K-23	K-24
Start Date	6/4/2016	6/4/2016	6/3/2016	6/3/2016	6/24/2016	7/2/2016	7/2/2016	7/5/2016	7/11/2016	7/11/2016	7/25/2016
Duration (hour)	0.27	0.28	0.52	0.55	0.53	0.49	0.5	0.51	0.51	0.52	0.53
Distance Fished (km)	1.41	1.46	2.92	2.94	2.87	2.72	2.8	2.86	2.83	2.84	2.9
Mid-Latitude (ºN)	58.22	58.28	58.28	58.33	58.33	58.33	58.33	58.34	58.34	58.33	58.34
Mid-Longitude (ºW)	-161.55	-160.81	-159.97	-159.56	-168.47	-169.12	-169.73	-170.37	-171.01	-171.65	-172.3
Bottom Depth (m)	41	32	41	23	65	68	69	75	84	96	103
Bottom Temperature (ºC)	6.4	7.5	6.9	8.4	4.5	4.2	4.1	3.7	2.9	3	3.4
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	77	0	73	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	1.79	0.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	0	799	77	0	654	3,044	157	143	425	1,255	821
Mature males	0	319	77	0	799	5,580	157	214	71	0	0
Legal	0	0	0	0	727	4,312	79	71	71	0	0
Immature females	0	0	0	0	0	0	0	0	0	279	616
Mature females	0	0	0	0	0	0	0	0	0	70	821
Total weight (kg)	0.00	2.66	0.76	0.00	9.16	43.12	1.38	1.69	1.43	1.77	1.75
Opilio Tanner Crab											
Immature males	0	0	0	0	2,107	846	472	4,493	10,200	837	7,193
Mature males	0	0	0	0	581	676	709	0	142	279	2,014
Legal	0	0	0	0	2,107	1,437	945	357	1,133	418	5,467
Immature females	0	0	0	0	0	85	0	8,059	5,671	1,952	0
Mature females	0	0	0	0	0	0	0	4,565	18,541	558	297,470
Total weight (kg)	0.00	0.00	0.00	0.00	8.18	5.48	4.04	15.62	41.06	3.75	269.78
Hybrid Tanner Crab											
Immature males	0	0	0	0	218	1,268	0	143	0	349	0
Mature males	0	0	0	0	0	592	0	0	0	70	0
Immature females	0	0	0	0	0	0	0	143	0	139	0
Mature females	0	0	0	0	0	0	0	214	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.77	5.80	0.00	0.75	0.00	0.42	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	K-25	K-26	K-27	L-01	L-02	L-03	L-04	L-05	L-06	L-07	L-08
Start Date	7/25/2016	7/25/2016	7/25/2016	6/23/2016	6/24/2016	6/22/2016	6/12/2016	6/12/2016	6/10/2016	6/10/2016	6/5/2016
Duration (hour)	0.53	0.5	0.5	0.52	0.52	0.52	0.52	0.52	0.51	0.5	0.53
Distance Fished (km)	2.95	2.76	2.72	2.83	2.77	2.83	2.87	2.89	2.81	2.78	3.02
Mid-Latitude (ºN)	58.34	58.32	58.34	58.67	58.68	58.67	58.66	58.66	58.68	58.65	58.66
Mid-Longitude (ºW)	-172.93	-173.57	-174.31	-167.87	-167.22	-166.56	-165.93	-165.3	-164.62	-164.02	-163.35
Bottom Depth (m)	109	116	169	46	43	42	37	39	37	36	32
Bottom Temperature (ºC)	3.6	4.1	3.9	5.7	6.3	6.3	6.5	7.2	7.6	7.8	7.6
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	156	0	80	0	0	0	0	76
Legal	0	0	0	78	0	80	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	78	311	80	241	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	5.81	4.72	3.56	2.85	0.00	0.00	0.00	2.03
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	139	641	2,324	313	311	80	322	0	0	0	305
Mature males	139	0	0	469	467	558	241	78	0	0	153
Legal	139	0	0	469	467	478	80	0	0	0	76
Immature females	209	712	3,413	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	1.19	0.29	0.69	4.32	4.34	3.19	2.85	0.52	0.00	0.00	2.15
Opilio Tanner Crab											
Immature males	2,814	3,203	0	0	78	0	0	0	0	0	0
Mature males	2,392	1,139	0	78	78	0	0	0	0	0	0
Legal	4,644	3,131	0	78	78	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	63,961	0	0	0	0	0	0	0	0	0
Total weight (kg)	26.28	70.86	0.00	0.67	0.60	0.00	0.00	0.00	0.00	0.00	0.00
Hybrid Tanner Crab											
Immature males	70	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	78	0	0
Immature females	70	0	0	0	0	0	0	0	0	0	0
Mature females	0	569	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.02	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	L-09	L-18	L-19	L-20	L-21	L-22	L-23	L-24	L-25	L-26	L-27
Start Date	6/5/2016	6/23/2016	7/2/2016	7/2/2016	7/5/2016	7/11/2016	7/11/2016	7/24/2016	7/24/2016	7/22/2016	7/24/2016
Duration (hour)	0.55	0.51	0.51	0.51	0.5	0.5	0.51	0.52	0.53	0.52	0.51
Distance Fished (km)	3.04	2.79	2.81	2.9	2.74	2.76	2.83	2.83	2.98	2.78	2.8
Mid-Latitude (ºN)	58.65	58.67	58.66	58.67	58.67	58.66	58.67	58.67	58.66	58.67	58.67
Mid-Longitude (ºW)	-162.72	-168.49	-169.15	-169.78	-170.43	-171.08	-171.72	-172.37	-173	-173.65	-174.28
Bottom Depth (m)	27	54	62	66	74	83	93	102	112	126	157
Bottom Temperature (ºC)	7.6	4.9	4.2	4	3.5	2.4	1.9	3.1	3.3	3.9	3.8
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	77	0	0	0	0	0	0	0	0	0
Legal	0	77	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	4.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	0	230	319	147	74	835	279	568	523	999	11,528
Mature males	0	154	719	220	0	0	0	0	65	77	0
Legal	0	77	559	147	0	0	0	0	65	77	0
Immature females	0	0	0	0	0	835	279	355	65	845	14,104
Mature females	0	0	0	0	0	0	0	0	0	615	0
Total weight (kg)	0.00	1.61	5.10	1.47	0.09	1.08	0.34	0.30	0.58	2.74	4.40
Opilio Tanner Crab											
Immature males	0	0	160	734	8,151	129,077	975	852	1,110	3,917	0
Mature males	0	0	0	147	222	653	209	71	1,372	4,189	0
Legal	0	0	0	294	1,556	2,974	696	213	2,286	7,331	0
Immature females	0	77	80	220	4,965	583,747	488	355	0	0	68
Mature females	0	0	0	73	1,037	59,653	0	0	588	6,687	0
Total weight (kg)	0.00	0.03	0.03	2.04	18.10	459.61	4.19	1.62	13.94	51.14	0.01
Hybrid Tanner Crab											
Immature males	0	0	160	0	148	490	70	0	0	0	0
Mature males	0	0	0	0	148	73	0	0	0	0	0
Immature females	0	0	0	0	0	0	70	0	0	0	0
Mature females	0	0	0	0	74	0	0	0	0	77	0
Total weight (kg)	0.00	0.00	0.33	0.00	0.86	1.14	0.07	0.00	0.00	0.13	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	L-28	L-29	L-30	L-31	M-01	M-02	M-03	M-04	M-05	M-06	M-07
Start Date	7/24/2016	7/24/2016	7/24/2016	7/23/2016	6/22/2016	6/22/2016	6/22/2016	6/11/2016	6/11/2016	6/10/2016	6/6/2016
Duration (hour)	0.49	0.5	0.49	0.49	0.53	0.52	0.52	0.53	0.54	0.53	0.54
Distance Fished (km)	2.75	2.72	2.66	2.75	2.96	2.91	2.87	2.9	3.07	2.96	2.83
Mid-Latitude (ºN)	58.69	58.67	58.66	58.66	59	59	59	59	59	58.98	59
Mid-Longitude (ºW)	-174.92	-175.55	-176.22	-176.86	-167.9	-167.23	-166.58	-165.93	-165.3	-164.64	-164
Bottom Depth (m)	194	136	141	137	42	40	35	31	28	28	28
Bottom Temperature (ºC)	3.7	2.8	3.2	3.4	5.9	6.6	7.7	7.4	8.4	8.4	8.2
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	151	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	75	0	0	0	0	0
Mature females	0	0	0	0	0	75	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	5.28	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	2,688	12,115	797	682	367	151	0	74	0	386	236
Mature males	849	9,749	0	0	0	151	0	0	0	0	0
Legal	566	6,165	0	0	0	151	0	0	0	0	0
Immature females	3,183	3,179	2,100	1,091	0	0	0	0	0	0	0
Mature females	1,768	30,024	0	0	0	0	0	0	0	0	0
Total weight (kg)	9.70	145.28	0.25	0.79	1.23	1.72	0.00	0.19	0.00	1.62	0.90
Opilio Tanner Crab											
Immature males	424	4,444	0	0	0	0	0	0	0	0	0
Mature males	71	2,151	0	0	73	75	0	0	0	0	0
Legal	283	5,090	0	0	73	75	0	0	0	0	0
Immature females	990	1,075	0	0	73	0	0	0	0	0	0
Mature females	0	3,512	0	0	0	0	0	0	0	0	0
Total weight (kg)	1.51	31.86	0.00	0.00	0.30	0.38	0.00	0.00	0.00	0.00	0.00
Hybrid Tanner Crab											
Immature males	0	215	0	0	0	0	0	0	0	0	0
Mature males	0	72	0	0	0	0	0	0	0	0	0
Immature females	0	358	0	0	0	0	0	0	0	0	0
Mature females	71	2,652	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.09	5.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	M-08	M-18	M-19	M-20	M-21	M-22	M-23	M-24	M-25	M-26	M-27
Start Date	6/5/2016	6/23/2016	7/2/2016	7/4/2016	7/4/2016	7/11/2016	7/11/2016	7/24/2016	7/24/2016	7/22/2016	7/22/2016
Duration (hour)	0.54	0.52	0.51	0.51	0.49	0.51	0.53	0.53	0.52	0.53	0.52
Distance Fished (km)	2.93	2.81	2.83	2.84	2.75	2.81	2.83	2.94	2.83	2.85	2.89
Mid-Latitude (ºN)	58.99	59	59	59.01	58.99	58.99	59	59	59	59	59
Mid-Longitude (ºW)	-163.37	-168.53	-169.18	-169.86	-170.48	-171.12	-171.78	-172.43	-173.06	-173.72	-174.36
Bottom Depth (m)	22	46	54	63	71	78	87	98	107	117	127
Bottom Temperature (ºC)	8.7	5.5	4.8	3.8	3.1	2.5	2.2	1.9	3	3.3	3.3
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	75	0	0	0	0	0	0	0
Legal	0	0	0	75	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	77	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	78	0	153	0	308	141	690	689	1,061	137	558
Mature males	78	0	0	75	0	0	0	0	71	0	209
Legal	0	0	0	75	0	0	0	0	71	0	209
Immature females	0	0	0	0	77	141	0	827	1,485	0	558
Mature females	0	0	0	0	0	70	0	0	212	0	0
Total weight (kg)	0.74	0.00	0.52	0.87	0.35	0.32	0.56	0.73	1.94	0.06	2.22
Opilio Tanner Crab											
Immature males	0	0	0	528	13,263	16,625	1,933	827	495	4,009	2,698
Mature males	0	0	0	0	463	634	414	0	283	2,091	3,777
Legal	0	0	0	75	2,236	3,311	1,036	0	495	4,706	6,151
Immature females	0	0	0	151	3,701	32,043	3,245	689	71	69	139
Mature females	0	0	0	0	308	3,452	345	276	2,121	1,918	70
Total weight (kg)	0.00	0.00	0.00	0.69	20.18	44.73	7.98	0.80	4.21	30.80	39.32
Hybrid Tanner Crab											
Immature males	0	0	0	0	463	211	276	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	276	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.53	0.13	0.29	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	M-28	M-29	M-30	M-31	M-32	N-01	N-02	N-03	N-04	N-05	N-06
Start Date	7/22/2016	7/22/2016	7/23/2016	7/23/2016	7/23/2016	6/10/2016	6/10/2016	6/11/2016	6/11/2016	6/6/2016	6/6/2016
Duration (hour)	0.54	0.51	0.51	0.5	0.51	0.54	0.53	0.54	0.54	0.57	0.55
Distance Fished (km)	2.98	2.79	2.8	2.74	2.8	3.04	2.98	2.96	3.06	3.27	3.14
Mid-Latitude (ºN)	59.01	58.99	59	59	58.98	59.34	59.34	59.33	59.34	59.33	59.32
Mid-Longitude (ºW)	-175	-175.74	-176.3	-176.91	-177.56	-167.92	-167.26	-166.61	-165.95	-165.31	-164.66
Bottom Depth (m)	130	134	135	137	134	40	32	28	24	20	23
Bottom Temperature (ºC)	2.7	2.6	2.7	3.2	3.2	5.5	6.6	7.3	8.3	8.7	9.2
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	4,505	407	67	413	201	0	0	76	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	3,631	136	67	207	67	0	0	0	0	0	0
Mature females	134	0	0	69	0	0	0	0	0	0	0
Total weight (kg)	3.29	0.25	0.27	0.67	0.19	0.00	0.00	0.31	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	269	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	471	0	67	0	0	67	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.30	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Immature females	134	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	N-07	N-18	N-19	N-20	N-21	N-22	N-23	N-24	N-25	N-26	N-27
Start Date	6/6/2016	6/23/2016	7/3/2016	7/4/2016	7/12/2016	7/12/2016	7/11/2016	7/23/2016	7/23/2016	7/23/2016	7/23/2016
Duration (hour)	0.55	0.52	0.51	0.51	0.5	0.52	0.51	0.52	0.53	0.54	0.52
Distance Fished (km)	3.15	2.93	2.79	2.86	2.75	2.82	2.83	2.87	2.97	2.94	2.92
Mid-Latitude (ºN)	59.34	59.33	59.34	59.33	59.31	59.33	59.34	59.33	59.34	59.33	59.33
Mid-Longitude (ºW)	-164.01	-168.58	-169.24	-169.87	-170.53	-171.19	-171.82	-172.49	-173.14	-173.8	-174.44
Bottom Depth (m)	23	42	51	60	68	75	80	87	100	111	121
Bottom Temperature (ºC)	9.9	5.4	4.9	3.9	3.3	2.5	2.8	1.9	1.9	2.8	2.9
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	74	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	2.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	65	0
Legal	0	0	0	0	0	0	0	0	0	65	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.92	0.00
Bairdi Tanner Crab											
Immature males	0	0	0	0	158	0	214	211	268	131	2,618
Mature males	0	0	0	0	0	0	71	70	0	131	0
Legal	0	0	0	0	0	0	71	70	0	131	0
Immature females	0	0	0	0	0	0	71	0	134	65	1,678
Mature females	0	0	0	0	0	0	0	0	67	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.31	0.00	0.91	0.43	0.36	1.73	2.20
Opilio Tanner Crab											
Immature males	0	74	239	0	15,652	9,389	6,709	986	937	980	336
Mature males	0	0	0	0	949	1,432	500	282	268	1,306	0
Legal	0	0	0	0	3,715	5,252	2,427	845	737	2,221	0
Immature females	0	148	0	0	8,696	7,318	3,701	1,973	804	131	537
Mature females	0	0	0	0	474	11,839	54,281	1,057	67	0	0
Total weight (kg)	0.00	0.04	0.05	0.00	26.64	42.15	58.93	5.90	4.47	15.24	0.12
Hybrid Tanner Crab											
Immature males	0	0	0	0	791	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	79	0	71	0	0	0	0
Mature females	0	0	0	0	0	0	143	70	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.32	0.00	0.20	0.07	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	N-28	N-29	N-30	N-31	O-01	O-02	O-03	O-04	O-18	O-19	O-20
Start Date	7/21/2016	7/22/2016	7/22/2016	7/22/2016	6/10/2016	6/7/2016	6/7/2016	6/7/2016	6/10/2016	7/3/2016	7/4/2016
Duration (hour)	0.54	0.5	0.51	0.5	0.52	0.54	0.54	0.54	0.54	0.51	0.52
Distance Fished (km)	2.89	2.71	2.78	2.77	2.93	2.91	2.93	3.08	3.04	2.77	2.84
Mid-Latitude (ºN)	59.33	59.33	59.33	59.34	59.67	59.67	59.67	59.66	59.67	59.66	59.67
Mid-Longitude (ºW)	-175.11	-175.76	-176.39	-177.05	-167.95	-167.29	-166.62	-165.94	-168.62	-169.27	-169.92
Bottom Depth (m)	133	137	137	150	35	31	29	22	39	48	57
Bottom Temperature (ºC)	2.4	1.7	2.1	2	4.5	5.4	7.1	8.4	3.3	4.4	3.7
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	66	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	0	722	210	479	0	0	0	0	0	0	0
Mature males	0	72	0	137	0	0	0	0	0	0	0
Legal	0	0	0	137	0	0	0	0	0	0	0
Immature females	0	289	210	137	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	1.30	0.06	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	335	0	629	548	0	0	0	0	199	0	359
Mature males	67	0	0	68	0	0	0	0	0	0	0
Legal	201	0	0	342	0	0	0	0	0	0	0
Immature females	268	0	629	685	0	0	0	0	0	0	215
Mature females	268	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	1.43	0.00	0.18	2.21	0.00	0.00	0.00	0.00	0.06	0.00	0.25
Hybrid Tanner Crab											
Immature males	0	0	0	68	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	68	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	O-21	O-22	O-23	O-24	O-25	O-26	O-27	O-28	O-29	O-30	O-31
Start Date	7/12/2016	7/12/2016	7/11/2016	7/13/2016	7/14/2016	7/15/2016	7/21/2016	7/20/2016	7/20/2016	7/21/2016	7/21/2016
Duration (hour)	0.5	0.5	0.51	0.51	0.52	0.51	0.53	0.52	0.53	0.5	0.5
Distance Fished (km)	2.71	2.78	2.85	2.84	2.85	2.8	2.89	2.88	2.82	2.7	2.67
Mid-Latitude (ºN)	59.66	59.66	59.66	59.67	59.67	59.68	59.67	59.66	59.67	59.68	59.69
Mid-Longitude (ºW)	-170.59	-171.24	-171.9	-172.56	-173.24	-173.86	-174.46	-175.12	-175.87	-176.54	-177.15
Bottom Depth (m)	67	73	78	85	95	104	115	125	137	136	163
Bottom Temperature (ºC)	3.5	3.3	2.6	1.3	1.3	2.3	2.6	2.5	1.6	1.8	2.1
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	71	147	0	0	0	0	0
Legal	0	0	0	0	71	73	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	2.31	3.26	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	77	0	71	0	0	147	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	73	0	0	0	0	70
Mature females	0	0	0	0	0	0	0	0	0	0	70
Total weight (kg)	0.19	0.00	0.12	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.20
Opilio Tanner Crab											
Immature males	41,889	7,256	6,892	0	1,417	2,348	4,081	1,264	569	0	141
Mature males	1,381	1,986	426	0	496	220	1,071	211	853	0	141
Legal	10,664	5,805	2,274	0	1,205	807	3,011	1,053	1,350	0	282
Immature females	7,595	153	3,126	0	779	1,027	0	0	71	0	141
Mature females	614	611	568	0	213	1,541	46,887	147,039	0	0	70
Total weight (kg)	77.93	28.36	15.98	0.00	6.41	7.05	60.81	83.82	7.87	0.00	1.80
Hybrid Tanner Crab											
Immature males	153	229	0	0	0	0	0	0	0	0	0
Mature males	0	76	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.16	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	ON2524	ON2625	P-01	P-18	P-19	P-20	P-21	P-22	P-23	P-24	P-25
Start Date	7/13/2016	7/14/2016	6/7/2016	6/9/2016	7/3/2016	7/4/2016	7/12/2016	7/12/2016	7/12/2016	7/13/2016	7/15/2016
Duration (hour)	0.53	0.52	0.54	0.54	0.52	0.51	0.5	0.5	0.51	0.52	0.53
Distance Fished (km)	2.88	2.92	2.89	3.07	2.82	2.81	2.78	2.81	2.76	2.83	2.82
Mid-Latitude (ºN)	59.5	59.5	60.01	60	60	60.01	60	59.95	59.99	59.99	60.01
Mid-Longitude (ºW)	-172.88	-173.5	-168	-168.65	-169.33	-169.96	-170.63	-171.3	-171.94	-172.6	-173.27
Bottom Depth (m)	94	102	26	39	46	55	65	70	68	67	75
Bottom Temperature (ºC)	1.4	2.2	5.6	2.9	3.8	2.7	3	2.9	1.8	1.6	1.2
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	76	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	78	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.31	0.00	1.71	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	75	551
Mature males	0	0	0	0	0	0	0	0	0	299	551
Legal	0	0	0	0	0	0	0	0	0	299	315
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	75	79
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.92	10.84
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	1,630	1,230	0	0	311	75	54,040	569	216	897	5,586
Mature males	747	0	0	0	0	0	154	71	0	75	157
Legal	951	137	0	0	0	75	1,535	284	0	224	944
Immature females	4,688	1,503	0	0	155	75	23,502	355	72	150	5,508
Mature females	543	0	0	0	0	0	2,482	0	0	0	944
Total weight (kg)	13.48	1.20	0.00	0.00	0.09	0.19	64.44	1.51	0.30	1.80	7.55
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	219	71	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.10	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	P-26	P-27	P-28	P-29	P-30	P-31	P-32	PO2423	PO2524	PO2625	PO2726
Start Date	7/16/2016	7/19/2016	7/20/2016	7/20/2016	7/21/2016	7/20/2016	7/20/2016	7/13/2016	7/14/2016	7/15/2016	7/15/2016
Duration (hour)	0.53	0.55	0.52	0.34	0.52	0.49	0.49	0.52	0.49	0.52	0.49
Distance Fished (km)	2.86	3.03	2.9	1.88	2.88	2.74	2.67	2.95	2.69	2.85	2.71
Mid-Latitude (ºN)	60	60	60	60	60	60	60	59.84	59.83	59.83	59.83
Mid-Longitude (ºW)	-173.94	-174.62	-175.28	-175.92	-176.72	-177.22	-177.87	-172.25	-172.94	-173.59	-174.24
Bottom Depth (m)	97	108	118	129	142	137	141	76	81	95	108
Bottom Temperature (ºC)	1.3	1.7	2.2	1.5	1.6	1.7	1.8	2	1.2	1.2	2.2
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	652	66	0	0	0	0	0	0	155	0	166
Legal	579	0	0	0	0	0	0	0	77	0	166
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	12.24	1.35	0.00	0.00	0.00	0.00	0.00	0.00	2.31	0.00	3.98
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	83
Mature males	0	0	0	0	0	0	0	0	0	0	83
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
Opilio Tanner Crab											
Immature males	145	1,595	2,988	6,217	266	0	225	1,269	8,819	43,449	1,327
Mature males	145	931	1,807	2,358	332	0	75	212	542	776	1,078
Legal	217	2,326	3,961	6,646	531	0	150	705	2,243	7,759	2,074
Immature females	434	0	69	214	66	71	0	353	4,796	0	249
Mature females	217	66	69	107	0	0	0	0	387	138,751	0
Total weight (kg)	1.58	13.79	22.79	23.43	3.60	0.01	1.04	4.51	16.95	199.86	10.01
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	Q-01	Q-02	Q-18	Q-19	Q-20	Q-21	Q-22	Q-23	Q-25	Q-26	Q-27
Start Date	6/9/2016	6/9/2016	6/9/2016	7/3/2016	7/3/2016	7/12/2016	7/13/2016	7/12/2016	7/14/2016	7/16/2016	7/19/2016
Duration (hour)	0.55	0.53	0.52	0.52	0.51	0.51	0.51	0.53	0.33	0.49	0.52
Distance Fished (km)	3.16	3.19	2.9	2.83	2.83	2.8	2.8	2.79	1.85	2.7	2.81
Mid-Latitude (ºN)	60.33	60.33	60.34	60.32	60.34	60.33	60.33	60.34	60.29	60.33	60.33
Mid-Longitude (ºW)	-167.97	-167.28	-168.67	-169.34	-170.02	-170.66	-171.34	-172.05	-173.38	-174.06	-174.72
Bottom Depth (m)	31	30	37	43	52	62	67	59	63	90	102
Bottom Temperature (ºC)	6.1	6.2	3	1.2	1.3	1.7	1.7	0.4	1.2	1.1	1.3
Red King Crab											
Immature males	0	235	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	77	0	0	0	0	0	0	0
Legal	0	0	0	77	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.40	0.00	2.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	326	0	0
Mature males	0	78	0	0	0	0	0	151	435	0	74
Legal	0	0	0	0	0	0	0	0	435	0	74
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	76	326	0	0
Total weight (kg)	0.00	0.99	0.00	0.00	0.00	0.00	0.00	3.58	9.41	0.00	2.25
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	0	399	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	76	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.07	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	0	0	75	0	226	5,377	376,384	8,709	979	23,030	667
Mature males	0	0	0	0	0	215	72	76	0	452	2,074
Legal	0	0	0	0	0	574	723	151	0	2,032	2,444
Immature females	0	0	0	0	376	3,800	285,526	0	544	9,829	0
Mature females	0	0	0	0	0	143	15,728	227	0	3,032	74
Total weight (kg)	0.00	0.00	0.01	0.00	0.28	7.47	420.64	8.10	0.17	36.76	15.47
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	399	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	Q-28	Q-29	Q-30	Q-31	QP2423	QP2524	QP2625	QP2726	R-22	R-23	R-24
Start Date	7/19/2016	7/19/2016	7/21/2016	7/20/2016	7/13/2016	7/14/2016	7/15/2016	7/16/2016	7/13/2016	7/13/2016	7/14/2016
Duration (hour)	0.53	0.52	0.5	0.5	0.52	0.52	0.52	0.49	0.5	0.51	0.53
Distance Fished (km)	2.95	2.9	2.61	2.76	2.79	2.88	2.88	2.68	2.77	2.78	2.98
Mid-Latitude (ºN)	60.34	60.34	60.34	60.35	60.17	60.17	60.12	60.17	60.65	60.67	60.66
Mid-Longitude (ºW)	-175.37	-176.05	-176.71	-177.38	-172.33	-173.01	-173.78	-174.36	-171.44	-172.11	-172.73
Bottom Depth (m)	111	123	137	149	58	60	89	100	63	61	45
Bottom Temperature (ºC)	1.4	1.7	1.5	1.5	1.5	1.4	1.1	1.4	-0.4	-0.7	3.9
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	1,804	142	0	0	0	0	73
Mature males	0	0	0	0	2,255	71	0	75	0	0	1,094
Legal	0	0	0	0	902	71	0	75	0	0	802
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	225	213	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	53.33	3.74	0.00	2.17	0.00	0.00	22.72
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	71	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	71	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	2,113	992	295	69	75	37,516	16,922	377	1,043,380	97,199	0
Mature males	1,620	496	147	69	0	71	214	151	0	73	0
Legal	3,311	1,275	442	69	0	498	1,928	377	0	219	0
Immature females	282	0	74	0	150	76,656	8,692	151	648,549	54,216	146
Mature females	141	1,700	0	0	0	0	57,408	75	3,309	2,700	0
Total weight (kg)	19.22	8.82	2.48	0.42	0.03	21.07	76.54	2.27	624.94	72.64	0.01
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	862	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	862	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	R-25	R-26	R-27	R-28	R-29	R-30	R-31	R-32	S-22	S-23	S-24
Start Date	7/16/2016	7/16/2016	7/17/2016	7/17/2016	7/18/2016	7/18/2016	7/20/2016	7/20/2016	7/13/2016	7/13/2016	7/14/2016
Duration (hour)	0.52	0.52	0.53	0.52	0.51	0.53	0.5	0.48	0.51	0.5	0.5
Distance Fished (km)	2.86	2.79	2.9	2.82	2.88	2.84	2.76	2.67	2.78	2.77	2.76
Mid-Latitude (ºN)	60.66	60.67	60.67	60.67	60.67	60.67	60.67	60.67	60.98	61	61
Mid-Longitude (ºW)	-173.46	-174.13	-174.82	-175.45	-176.19	-176.81	-177.53	-178.19	-171.5	-172.14	-172.81
Bottom Depth (m)	65	87	97	107	119	129	148	162	60	64	67
Bottom Temperature (ºC)	1.4	0.9	1	1.4	1.8	1.4	1.5	2.4	-0.5	-0.8	-1.1
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	66	0	0	0	0	0	0	0	0
Legal	0	0	66	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	56,916	75,505	5,756	1,831	344	408	69	2,387	519,227	118,020	195,047
Mature males	0	2,489	719	2,465	896	408	69	70	0	0	0
Legal	1,435	5,808	5,036	3,592	1,102	680	69	70	0	73	132
Immature females	45,236	90,951	665	282	69	204	206	2,246	472,069	145,956	159,052
Mature females	8,578	101,975	1,396	0	0	0	0	0	8,282	6,223	9,478
Total weight (kg)	60.43	198.72	26.22	22.83	7.42	3.97	0.59	1.00	342.76	87.52	169.94
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	S-25	S-26	S-27	S-28	S-29	S-30	S-31	T-25	T-26	T-27	T-28
Start Date	7/14/2016	7/17/2016	7/17/2016	7/18/2016	7/18/2016	7/19/2016	7/19/2016	7/14/2016	7/16/2016	7/17/2016	7/17/2016
Duration (hour)	0.52	0.51	0.51	0.52	0.52	0.49	0.5	0.52	0.5	0.5	0.52
Distance Fished (km)	2.86	2.84	2.84	2.85	2.87	2.71	2.79	2.82	2.78	2.76	2.9
Mid-Latitude (ºN)	61	61	61	61	61	61	61	61.33	61.33	61.32	61.32
Mid-Longitude (ºW)	-173.49	-174.18	-174.88	-175.54	-176.29	-176.98	-177.64	-173.58	-174.33	-175.01	-175.64
Bottom Depth (m)	75	83	92	103	112	121	135	74	79	88	97
Bottom Temperature (ºC)	-0.9	0.4	0.9	1.2	1.5	1.5	1.4	-1.3	-1.4	0.4	0.7
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	66
Legal	0	0	0	0	0	0	0	0	0	0	66
Immature females	0	0	0	0	0	70	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.00	0.00	2.46
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	110,529	96,963	38,920	10,396	535	422	418	189,391	171,606	107,278	9,610
Mature males	0	1,112	2,858	6,534	2,005	5,491	348	0	143	566	928
Legal	1,247	10,707	20,957	14,257	2,272	5,703	488	353	2,292	3,678	2,982
Immature females	175,295	90,501	1,293	0	267	774	70	215,017	169,025	85,471	1,326
Mature females	9,671	20,569	12,247	0	1,270	0	70	3,816	11,258	36,241	2,585
Total weight (kg)	140.92	168.12	122.44	71.60	18.75	44.79	2.88	151.56	168.64	157.18	23.94
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	T-29	T-30	U-25	U-26	U-27	U-28	U-29	V-25	V-26	V-27	V-28
Start Date	7/19/2016	7/19/2016	7/14/2016	7/16/2016	7/16/2016	7/16/2016	7/16/2016	7/15/2016	7/15/2016	7/15/2016	7/15/2016
Duration (hour)	0.52	0.51	0.51	0.51	0.5	0.51	0.5	0.52	0.51	0.51	0.46
Distance Fished (km)	2.8	2.74	2.78	2.78	2.69	2.78	2.78	2.85	2.82	2.79	2.54
Mid-Latitude (ºN)	61.33	61.33	61.67	61.66	61.67	61.67	61.67	62	62	62	62
Mid-Longitude (ºW)	-176.33	-176.96	-173.66	-174.45	-175.06	-175.77	-176.47	-173.73	-174.51	-175.17	-175.84
Bottom Depth (m)	107	116	71	77	85	96	106	63	74	81	92
Bottom Temperature (ºC)	1.3	1.4	-1.2	-1.4	-1.2	0.5	1	-1.3	-1.4	-1.5	-0.5
Red King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Blue King Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bairdi Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Legal	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Opilio Tanner Crab											
Immature males	1,222	7,587	258,405	147,803	140,392	19,858	4,262	350,881	819,038	50,294	16,688
Mature males	611	2,227	0	0	304	353	1,100	0	0	139	290
Legal	1,222	2,506	0	138	759	2,756	2,887	69	0	279	1,088
Immature females	0	13,921	308,632	239,436	93,239	8,410	137	315,041	834,802	26,624	7,328
Mature females	747	0	2,861	8,717	15,304	4,523	1,237	7,376	29,262	2,439	5,079
Total weight (kg)	8.76	25.96	141.72	133.64	127.24	33.82	18.14	168.16	509.32	34.04	25.98
Hybrid Tanner Crab											
Immature males	0	0	0	0	0	0	0	0	0	0	0
Mature males	0	0	0	0	0	0	0	0	0	0	0
Immature females	0	0	0	0	0	0	0	0	0	0	0
Mature females	0	0	0	0	0	0	0	0	0	0	0
Total weight (kg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Appendix: Tow details, crab density (number nmi^{-2}), and catch weight at 2016 eastern Bering Sea bottom trawl survey stations.

Station	Z-05
Start Date	6/15/2016
Duration (hour)	0.49
Distance Fished (km)	2.82
Mid-Latitude (°N)	54.68
Mid-Longitude (°W)	-165.13
Bottom Depth (m)	83
Bottom Temperature (°C)	5.7
Red King Crab	
Immature males	0
Mature males	0
Legal	0
Immature females	0
Mature females	0
Total weight (kg)	0.00
Blue King Crab	
Immature males	0
Mature males	0
Legal	0
Immature females	0
Mature females	0
Total weight (kg)	0.00
Bairdi Tanner Crab	
Immature males	79
Mature males	79
Legal	79
Immature females	0
Mature females	0
Total weight (kg)	0.44
Opilio Tanner Crab	
Immature males	0
Mature males	0
Legal	0
Immature females	0
Mature females	0
Total weight (kg)	0.00
Hybrid Tanner Crab	
Immature males	0
Mature males	0
Immature females	0
Mature females	0
Total weight (kg)	0.00