Biology of Norton Sound red king c

what we know, what we think we know, what we don't know

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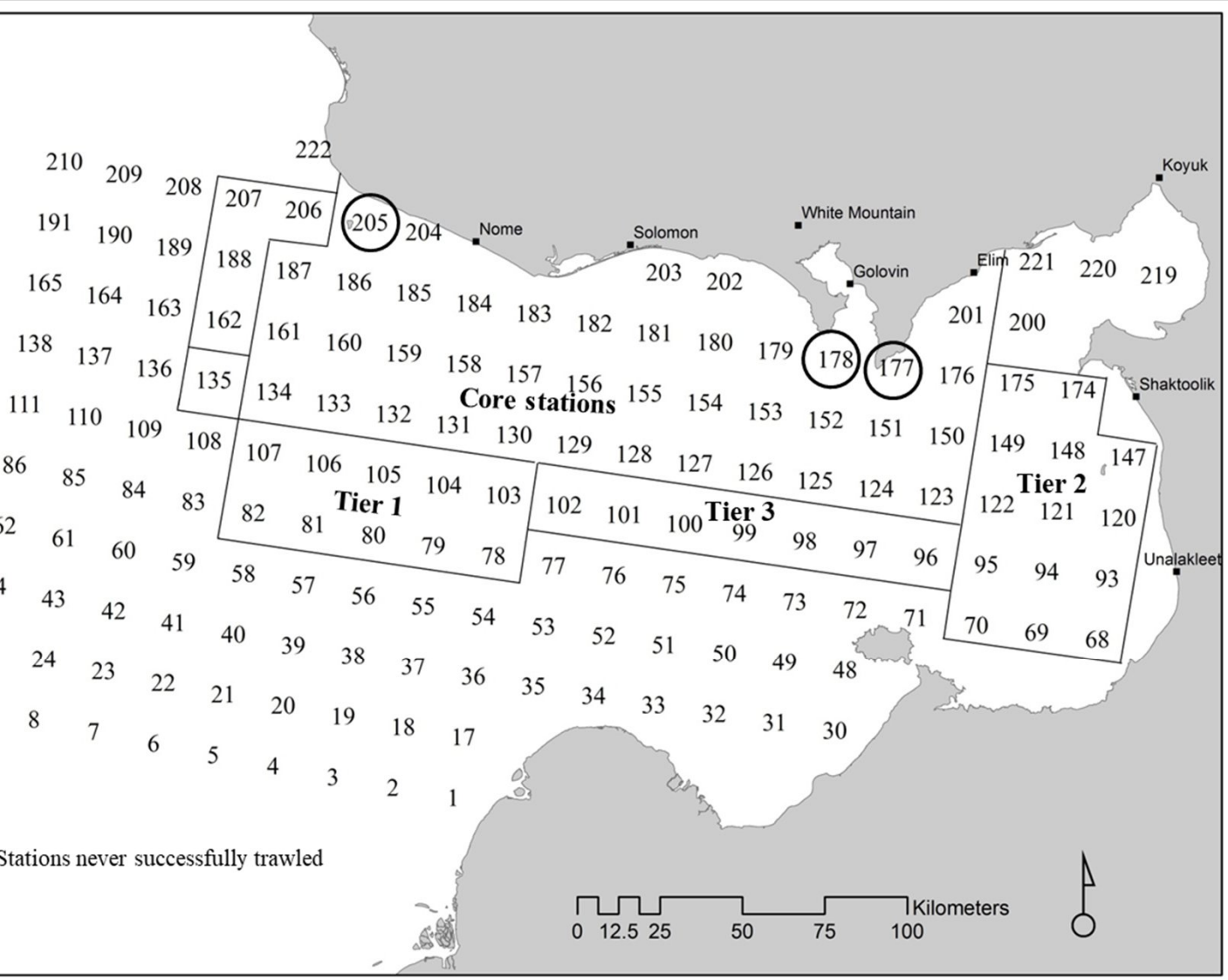
roduction

Tier 4

- Males only model
- Assumes differential mortality by size- large crab die at a higher rate
- Assumes discard mortality of M=0.2
- Molting occurs in September

undance



Triennial bottom trawl su

10 X 10 nmile grid

Core and Tier 1 stations becam
standardized in 1998 (Fair 199

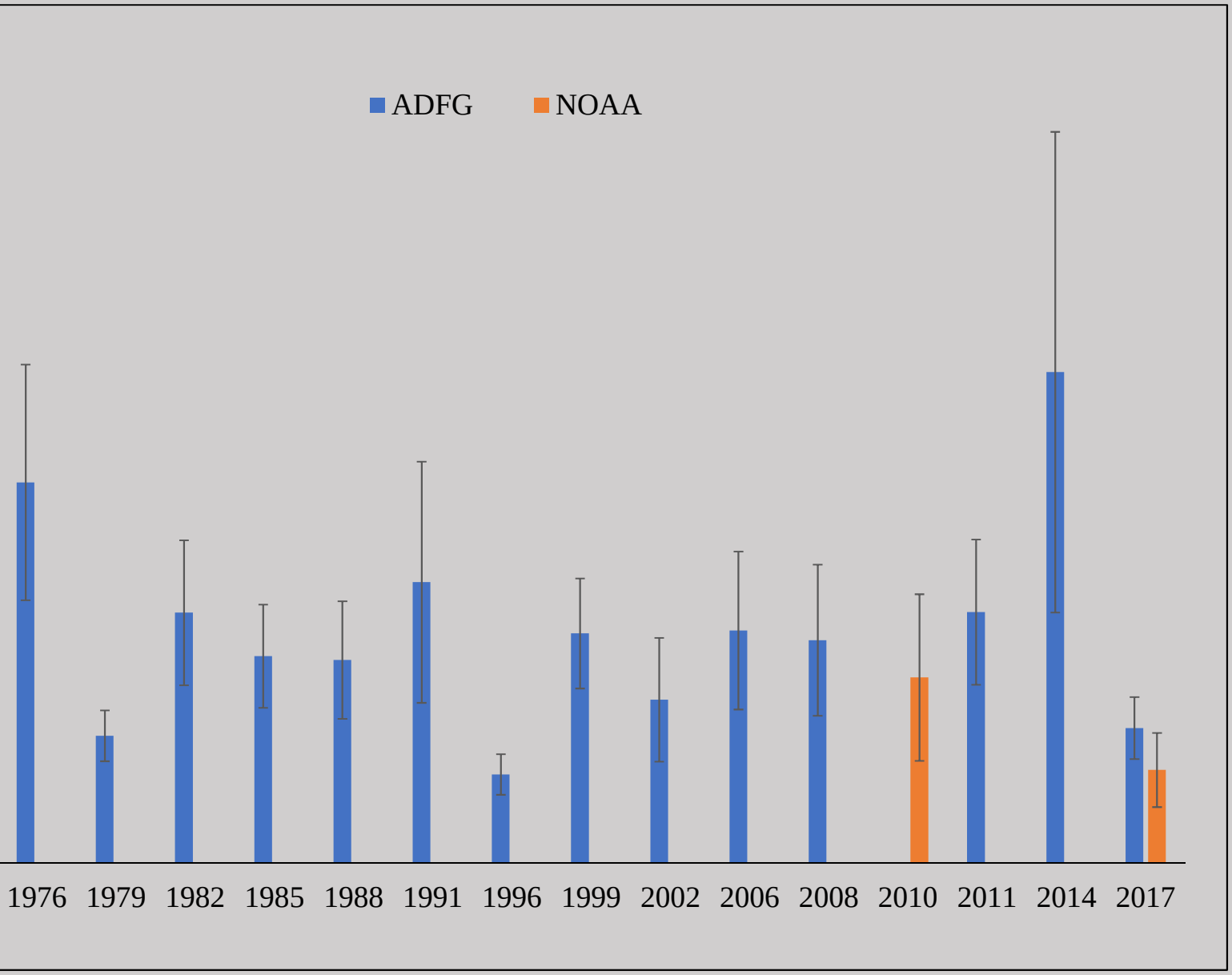
Tiers 2 and 3 were reported in
2002 trawl report (Brennan 20

Abundance:
area swept method

Standardization of Norton Sound trawl survey red king crab abundance estimates. Alaska Department of Fish and Game, Commercial Fisheries Division, AYK Region, Regional Infornlation Report 3A98-36, Anchorage.

2003 Analysis of Red king crab date from the 2002 ADF&G trawl survey of Norton Sound. Alaska Department of Fish and Game, Commercial Fisheries Division, AYK Region, Regional Information Report No. 3A02-52, Anchorage.

undance



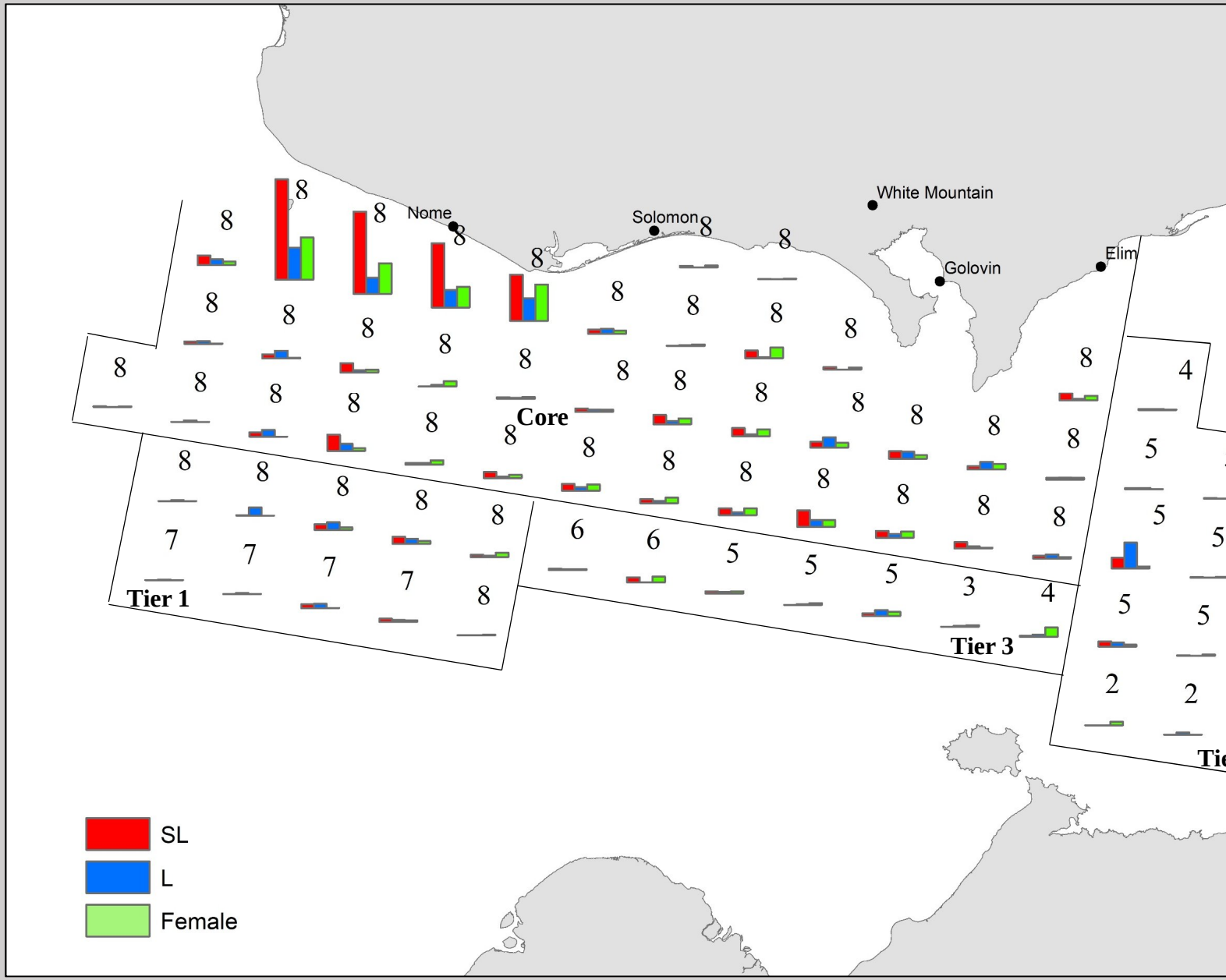
NOAA completed
bottom trawl sur
in 2010 and 20
(Uses 20 X 20 nm
grid)

2014- Majority
crab caught at
station (186

tribution

ge number of crab
red at each station
awl surveys from
1996-2017

tions just south
of Nome have
hest number of
captured crab



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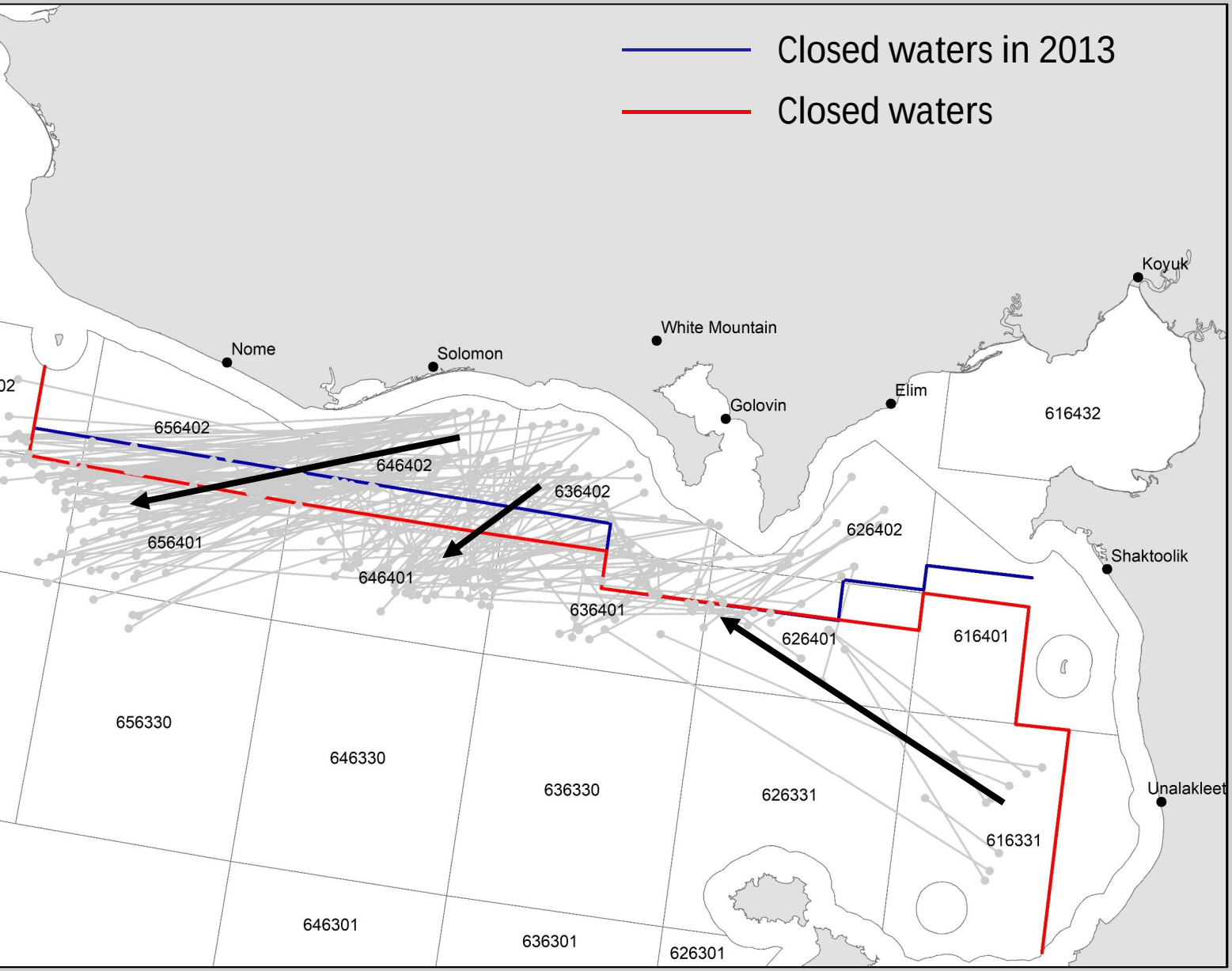


Based on spring tag
June, 2012-201

27,721 crab tagg
279 with recovery lo
(2,703 recovere

- General southv movement of northern crab
- General northv movement of southeast crab

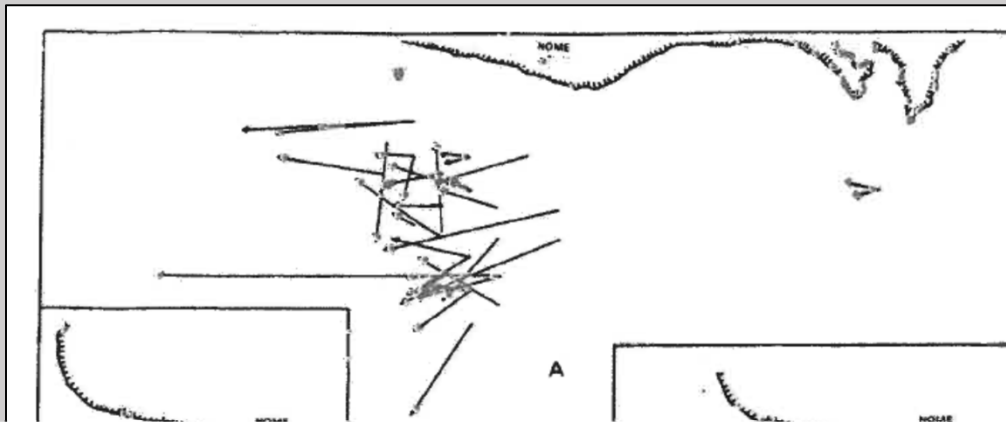
vement

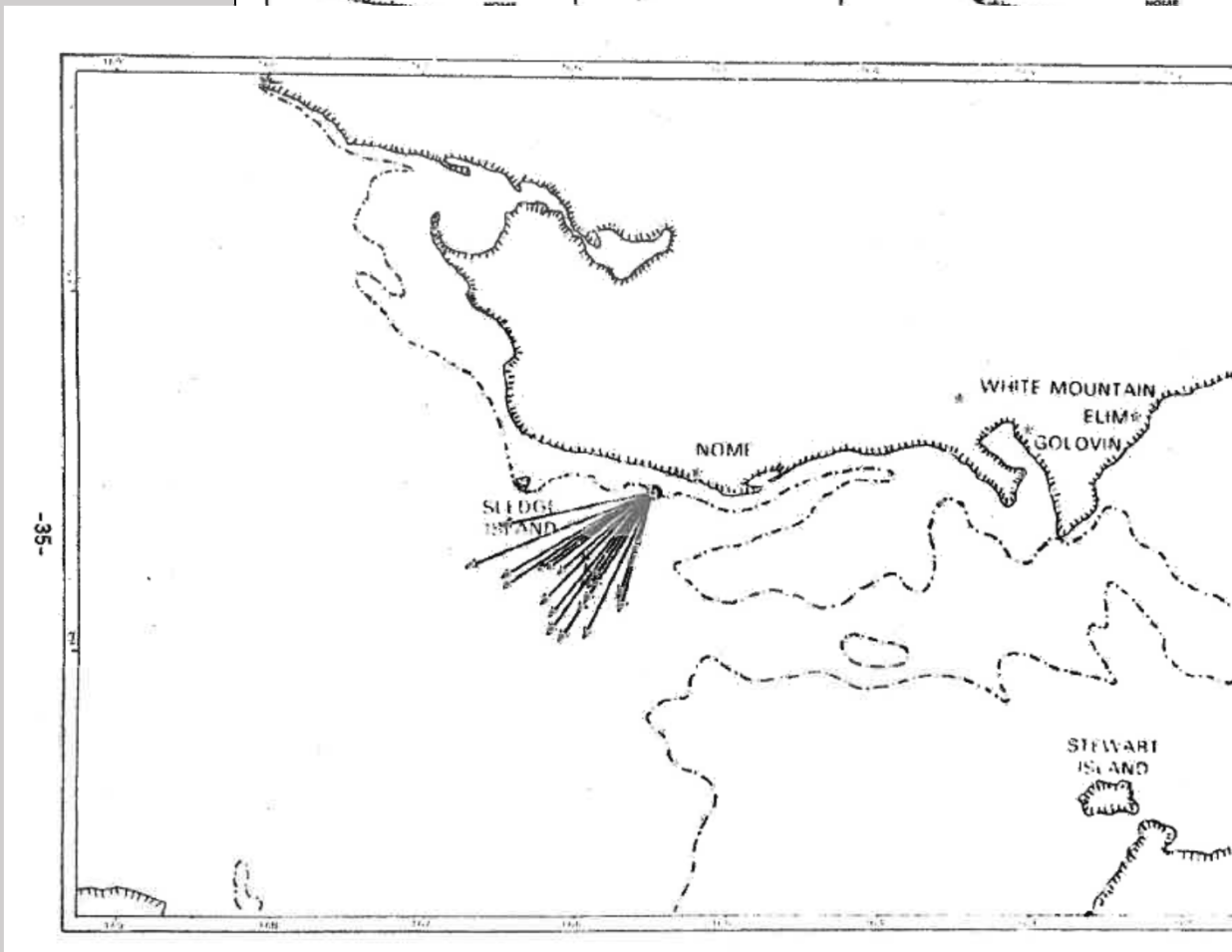
cal tagging completed by
rch vessels offshore of
e (top) or skiff (bottom)
nd recovered in the
mercial fisheries weeks
later.

ovement is generally
west/southwest

S RKC are one
population

1981-> 16-39 days free





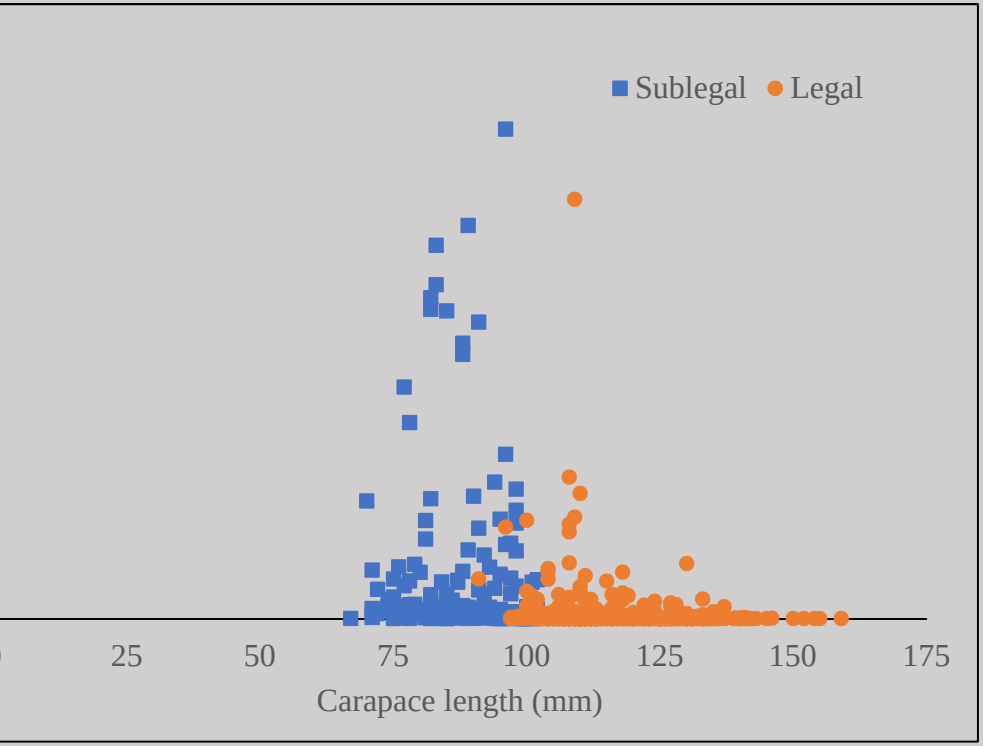
1981-> ~30 days free

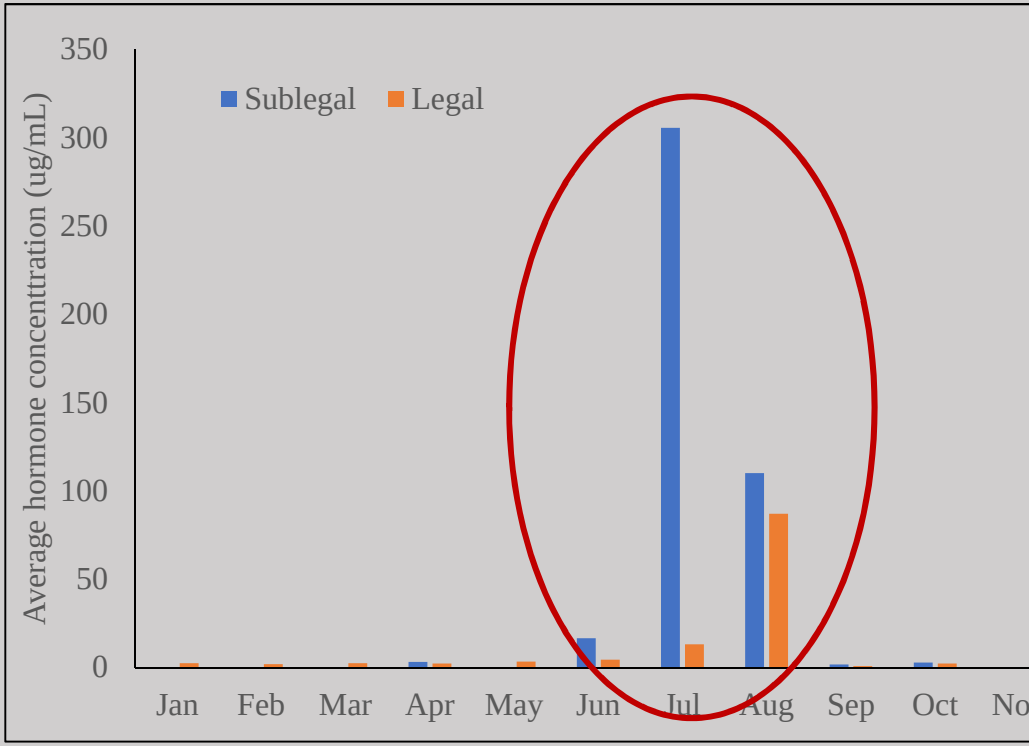
lt timing

Ecdysteroids- molting hormones can be measured in the b
Hormone levels increase 2-4 (?) weeks before molting

cted blood in 2014 and 2015

Sublegal crab molt earlier in the

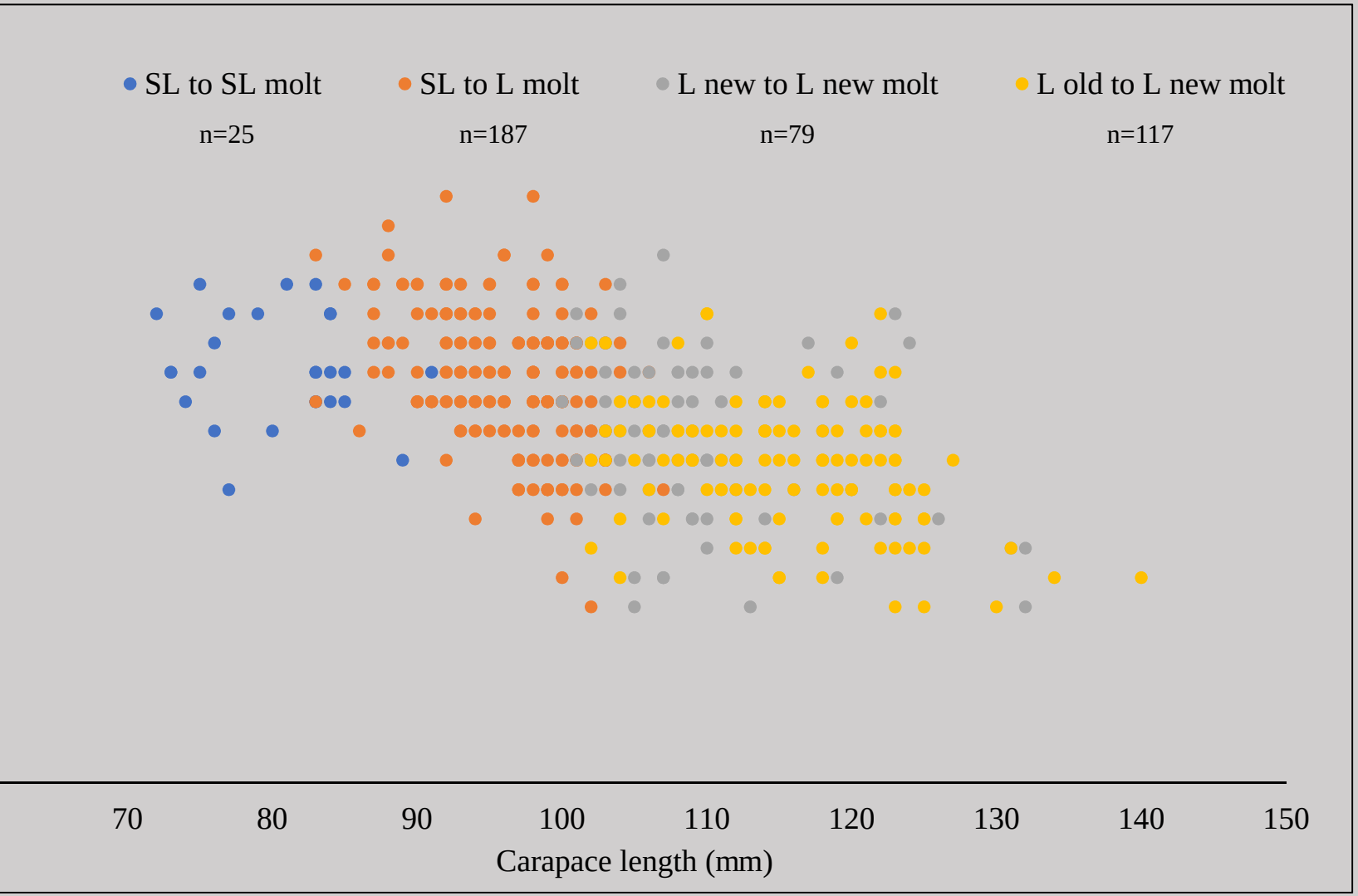




ormone concentration a function of sample location?

Offshore sampling

lt increment



From crab tagg
in spring
nearshore surv
and recovered
commercial an
spring survey th
next year

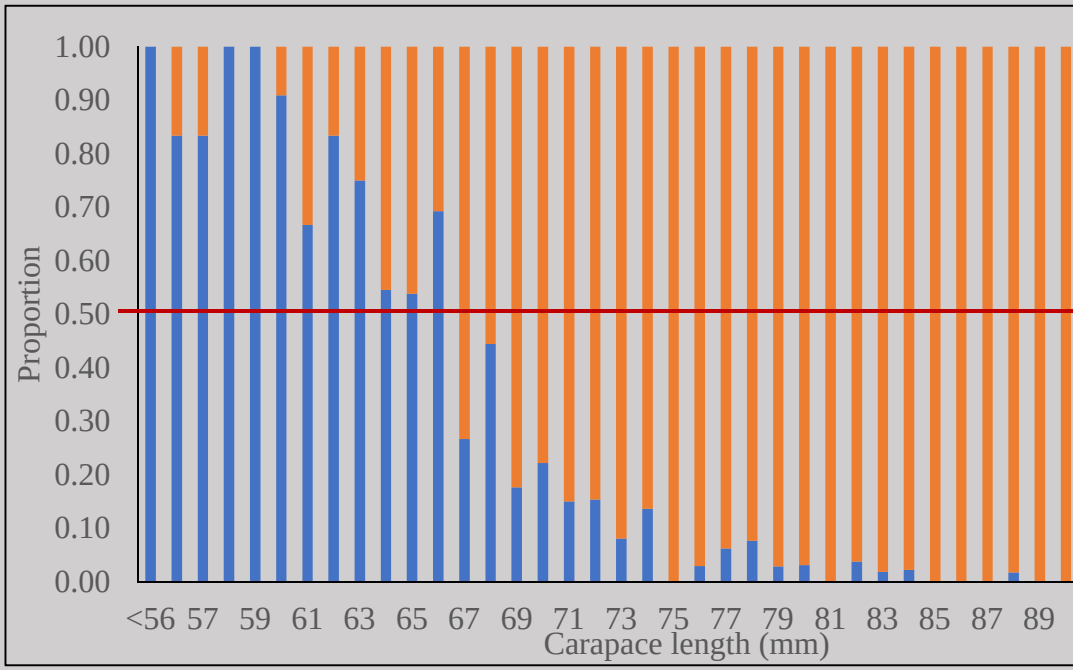
Sublega
RKC grov
faster

e at maturity
Females

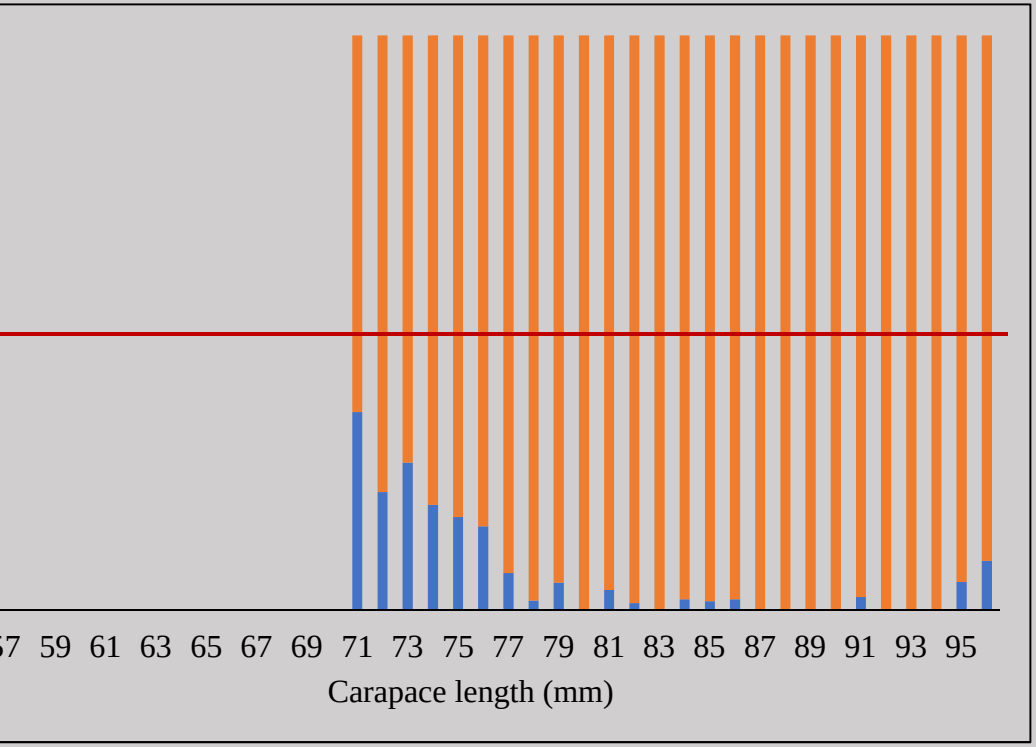
Clutch

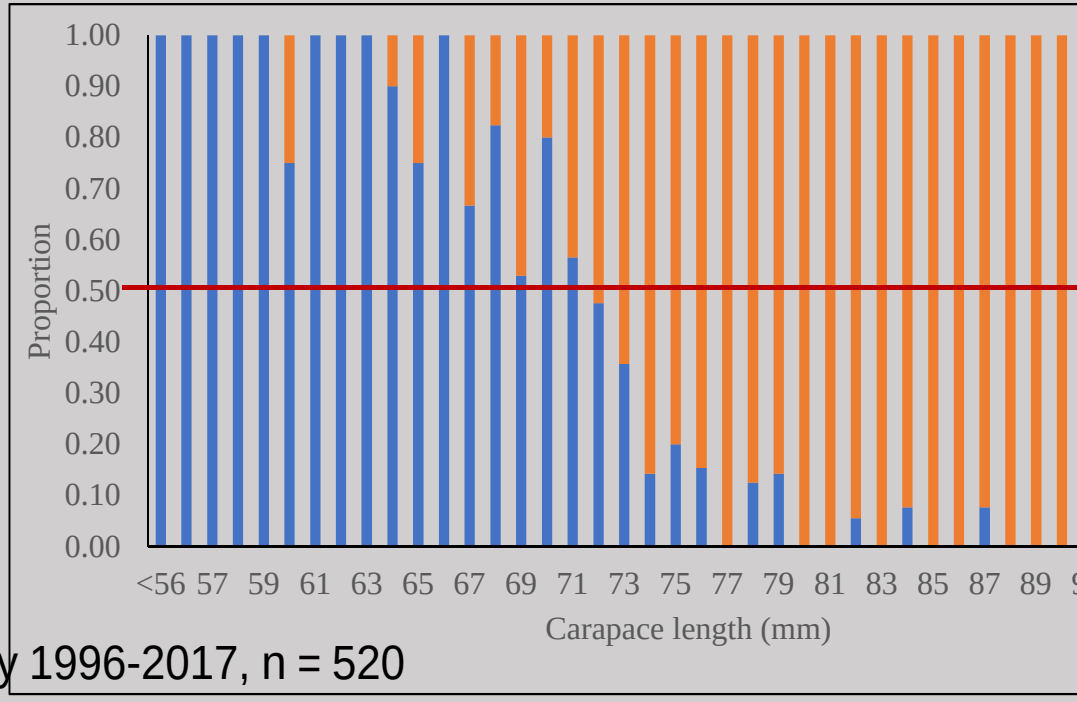
utch

Observer data 2012-2017; n = 1867



Tagging data 2012-2015; n = 1400





Trawl survey 1996-2017, n = 520

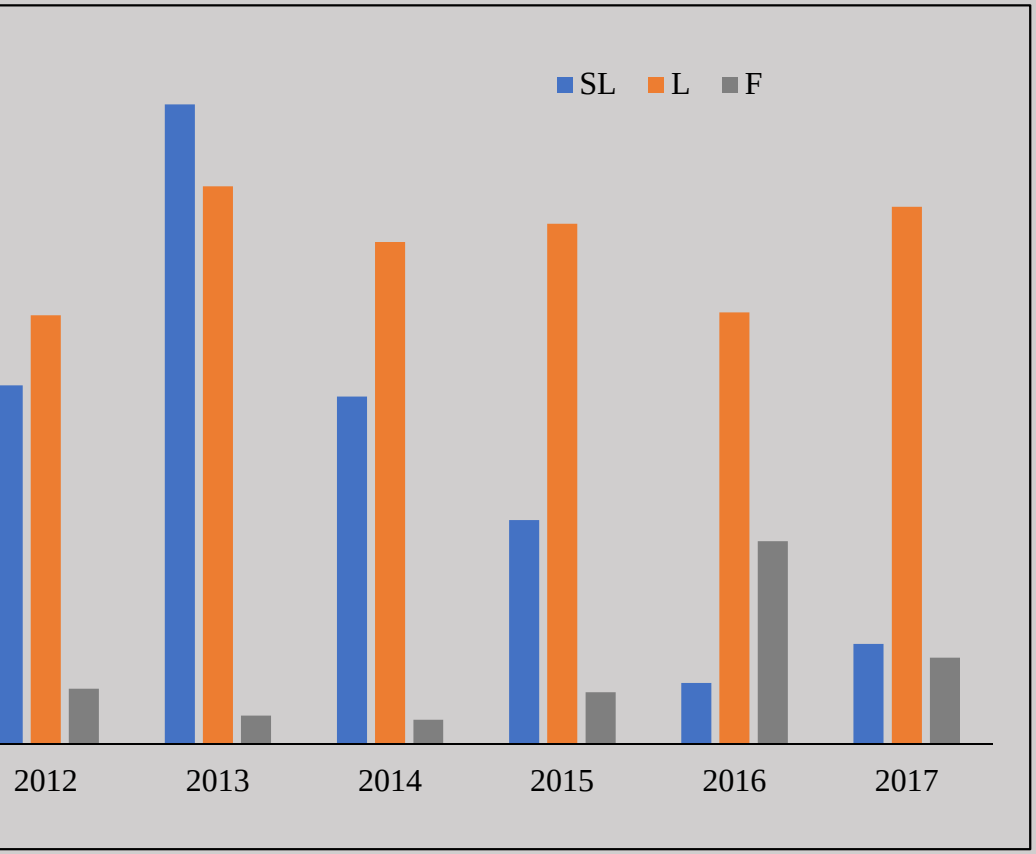
e at maturity
Males

siological maturity at 50 mm CL (Paul et al. 1991)

Unknown size of functional maturity but female maturity at 67-75 mm C
suggests males likely are > 70mm to successfully participate in mating

J. Paul, R. S. Otto, and R. A Macintosh. 1991. Spermatophore presence in relation to carapace length for eastern Bering Sea blue king crab (*Paralithodes platypus*, Brandt, 1850) and red king crab (*P. camtschaticus* (Tilesius, 1815)). J. Shell. Res. 10

andling Mortality-
ummer Commercial



dling in summer commercial fishery

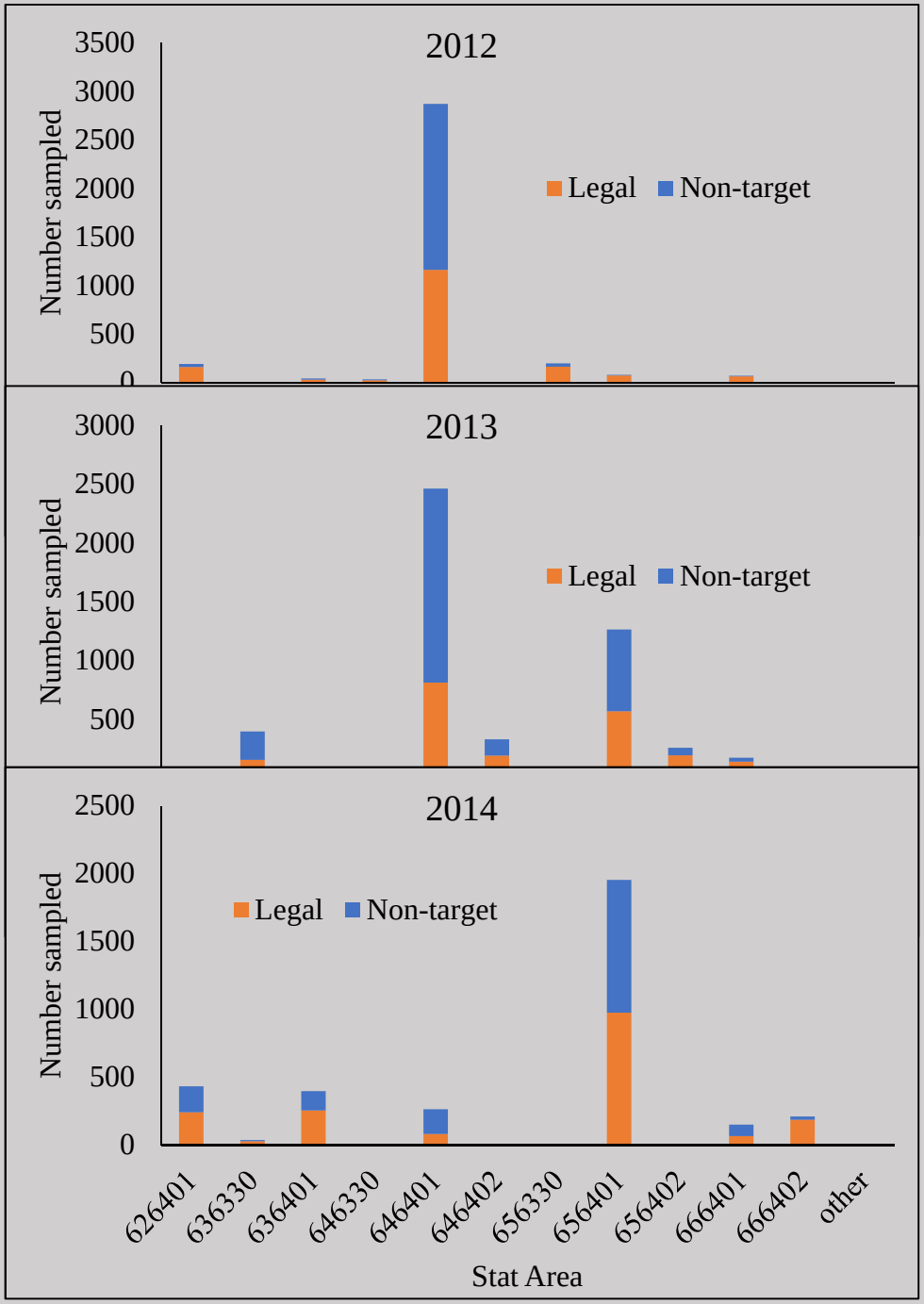
Concerns:
Program participants and use of escap
mechanisms

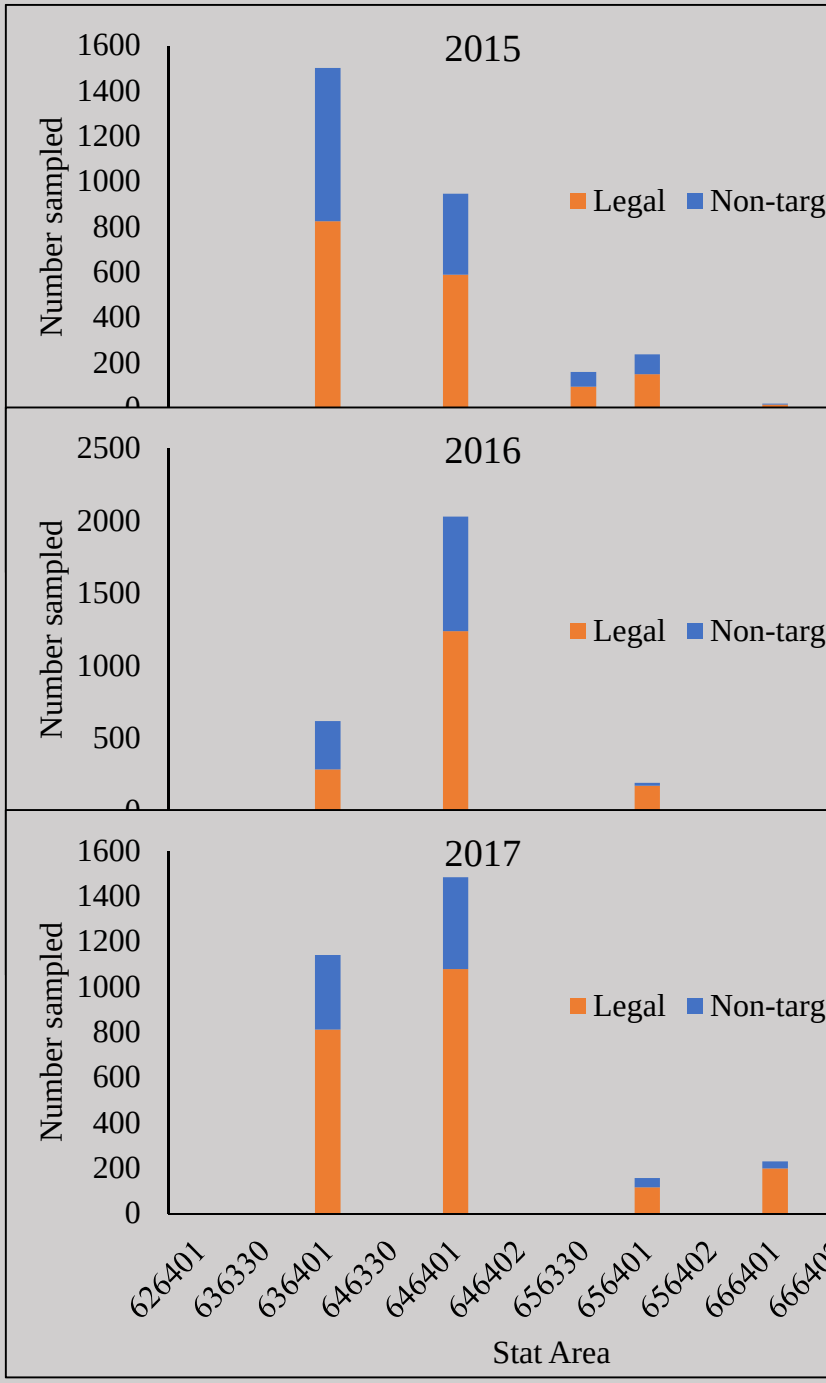
Fishing location and sublegal densitie

High abundance of sublegal crab in N
(detected by spring surveys) in 2013-2

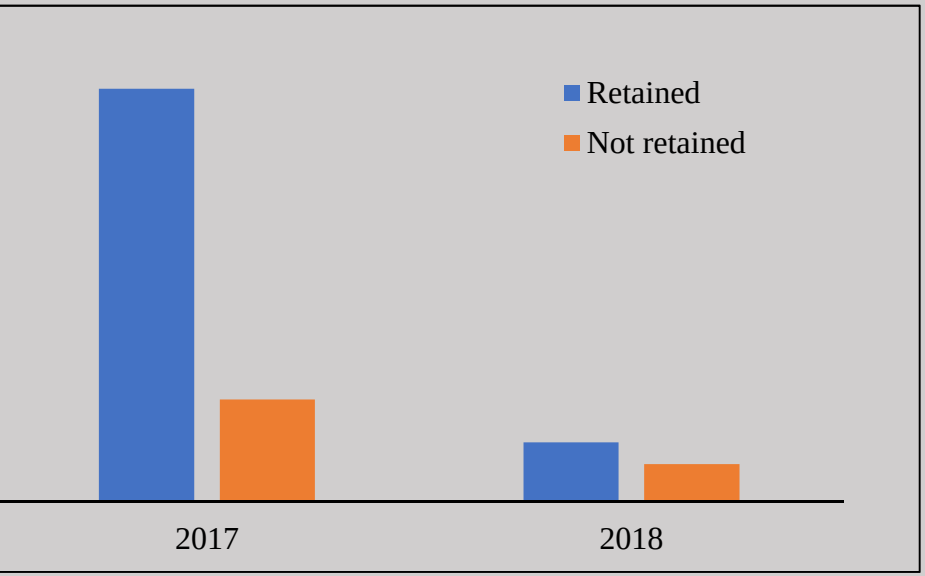
We assume handling mortality is
in summer commercial because
warm temps, small pots, short dr
water (<6ft)

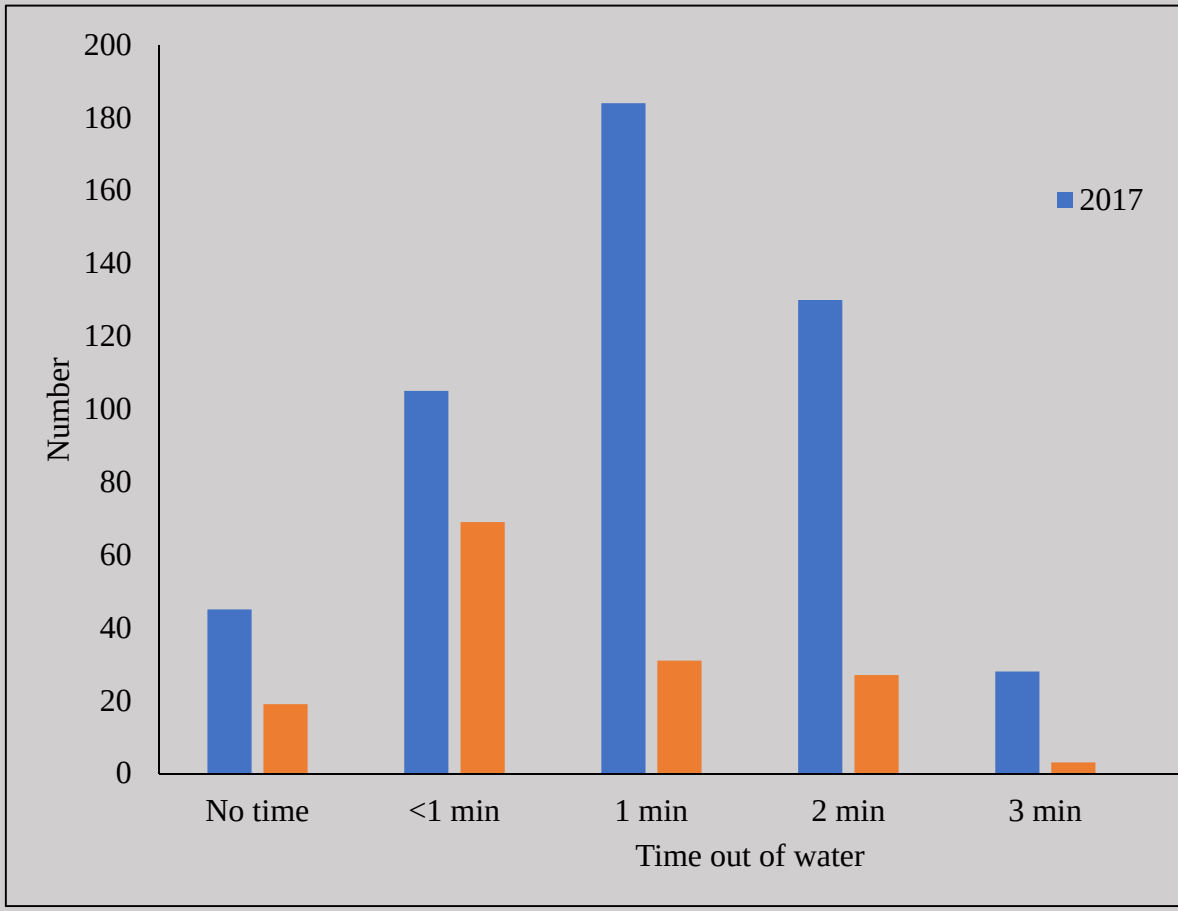
Summer Commercial





ndling Mortality- nter Commercial





- High-grading in 2018
- Assume initial mortality is low- live tanks
- Long-term effects unknown (Carls and O'Clair 1990, Shirley 1998)

lair. 1990. Influence of cold air exposures on oviferous red king crabs (Paralithodes camtschatica) and Tanner crabs (Chionoecetes Bairdi) and their offspring. Pages 329-343 in: Proceedings of the International Symposium on king and Tanner cr
90-04, Fairbanks.

cts of wind chill on red king crabs. Appendix B in: Kruse, G.H. 1999. King and Tanner crab research in Alaska: Annual Report for July 1, 1998 through June 30, 1999. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional In

nmary

hat we know:

- NSRKC is one population
- Male –legal and sublegal, and Female abundance
- estimate every 3 years
- Crab hotspots- not evenly distributed throughout NS
- Well-documented offshore movement in spring
- Molting earlier in SL crab, molting is offshore
- Growth is greater in SL crab
- Females >68 mm CL are reproductively viable

nmary

What we think we know:

Method of stratification to calculate abundance

Not all crab move offshore; Crabs stay inshore and don't molt: skip molt crab

Discard mortality may be low in the summer commercial fishery

nmary

hat we don’t know:

- Yearly male abundance estimate
- Timing of inshore movement
- Functional maturity of males
- Long-term effects of cold exposure
- Natural mortality-differential mortality by size?
- Location of large males

ving to Tier 3

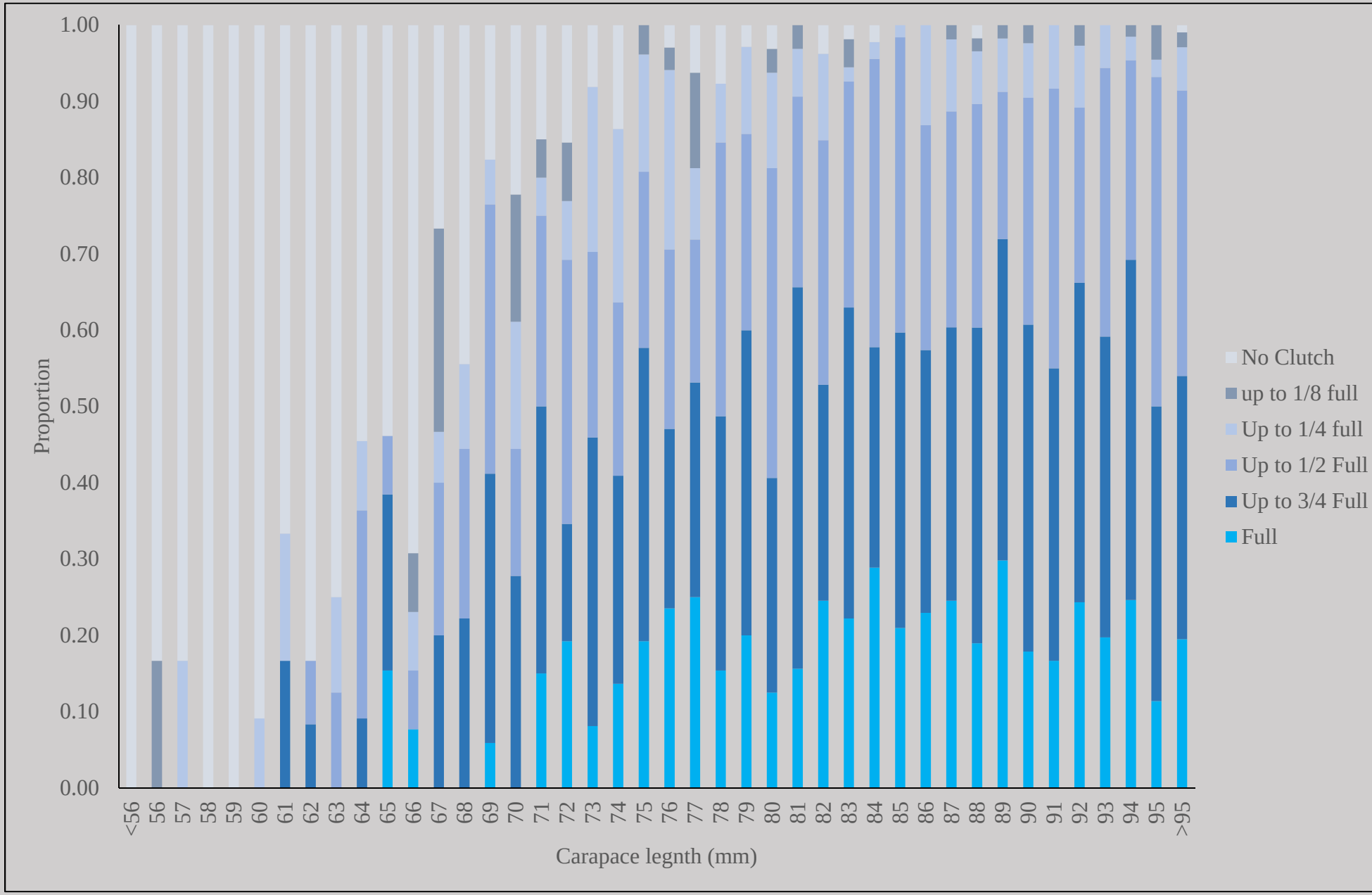
/e have spent 8 years adding to
he existing understanding of NS
RKC biology

What does the CPT recommend to move to Tier 3?

- Research ideas?
- Data mining?

Additional slides...

clutch
by CL,
r data
017



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by CL,
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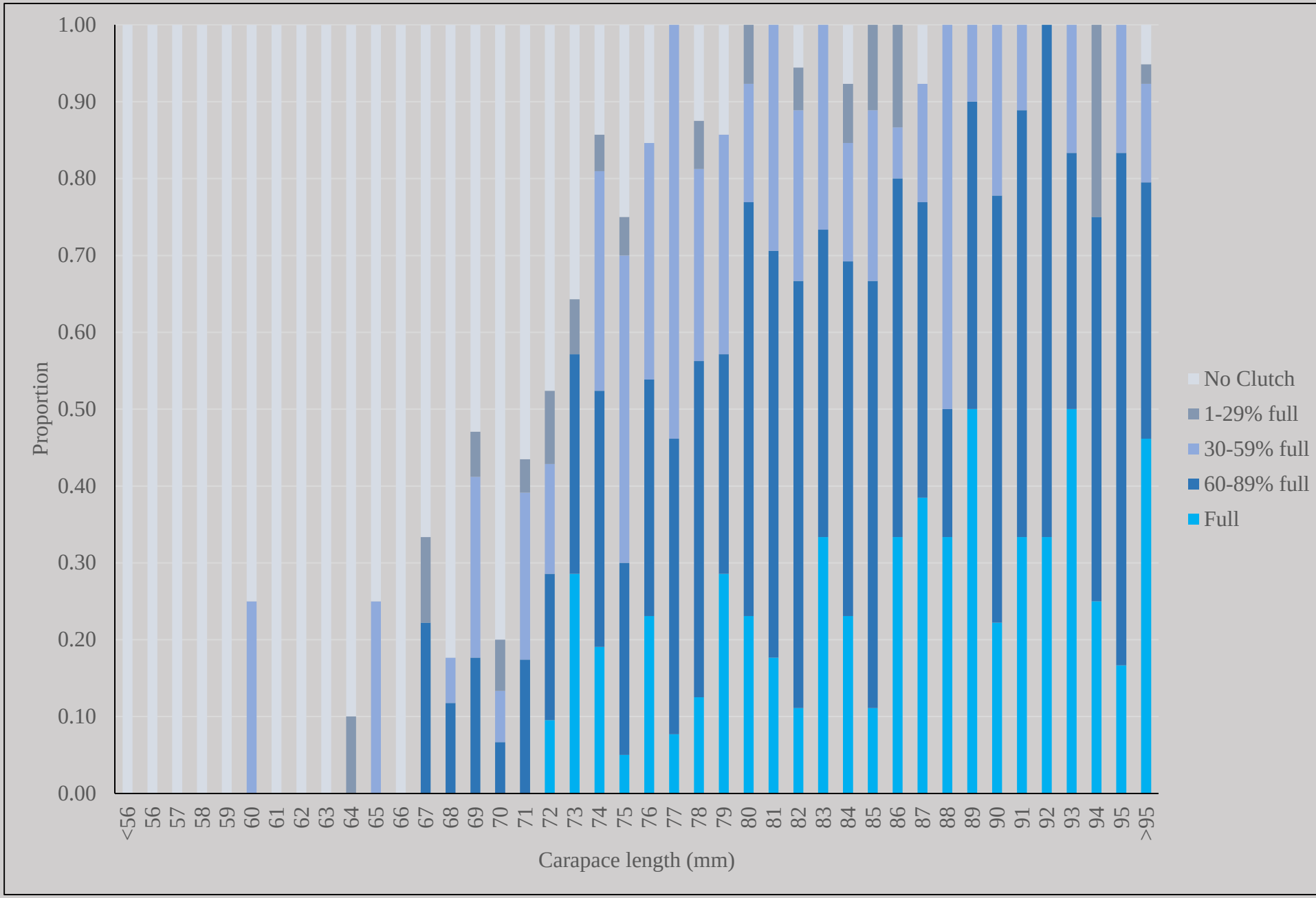
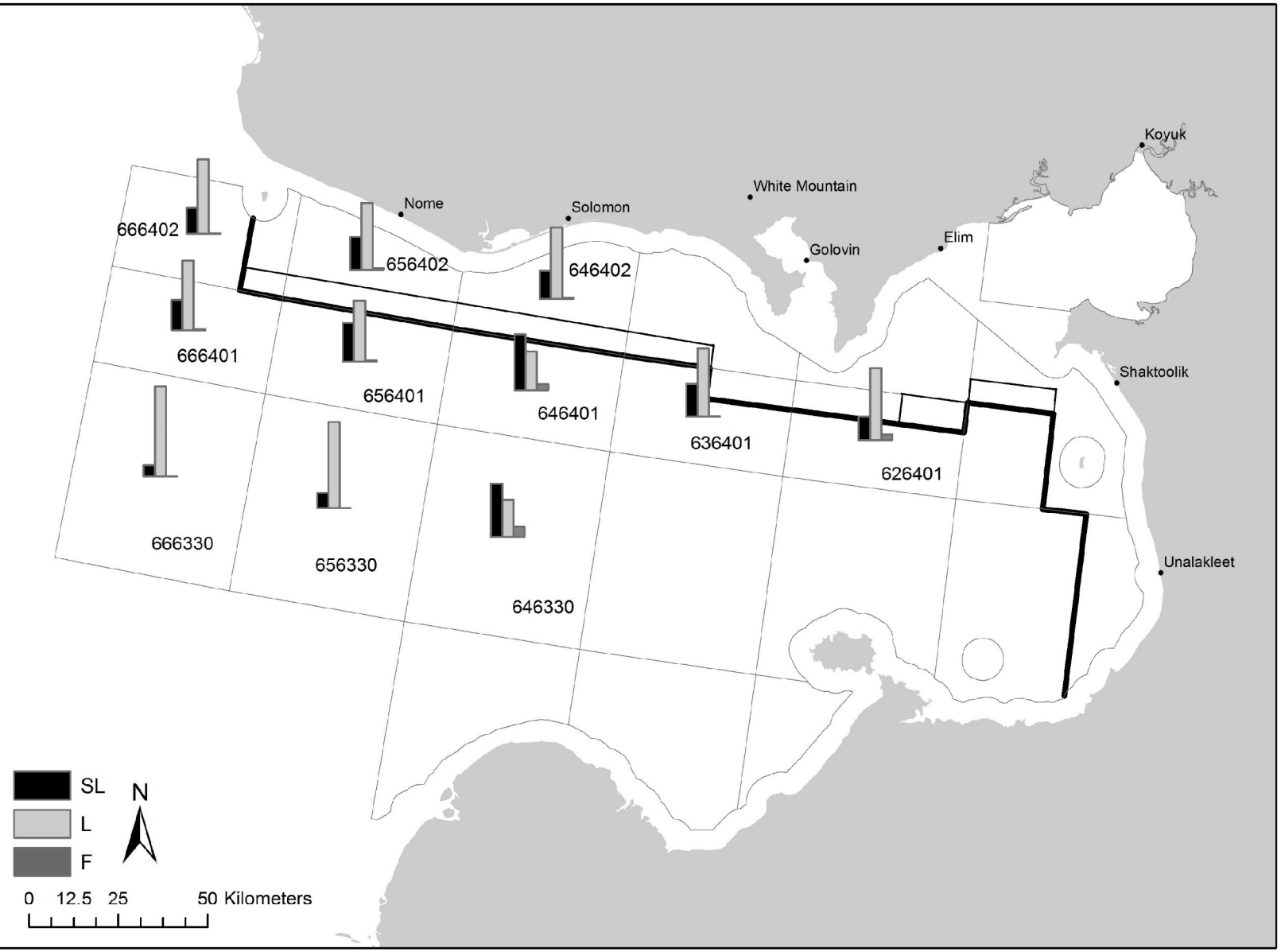
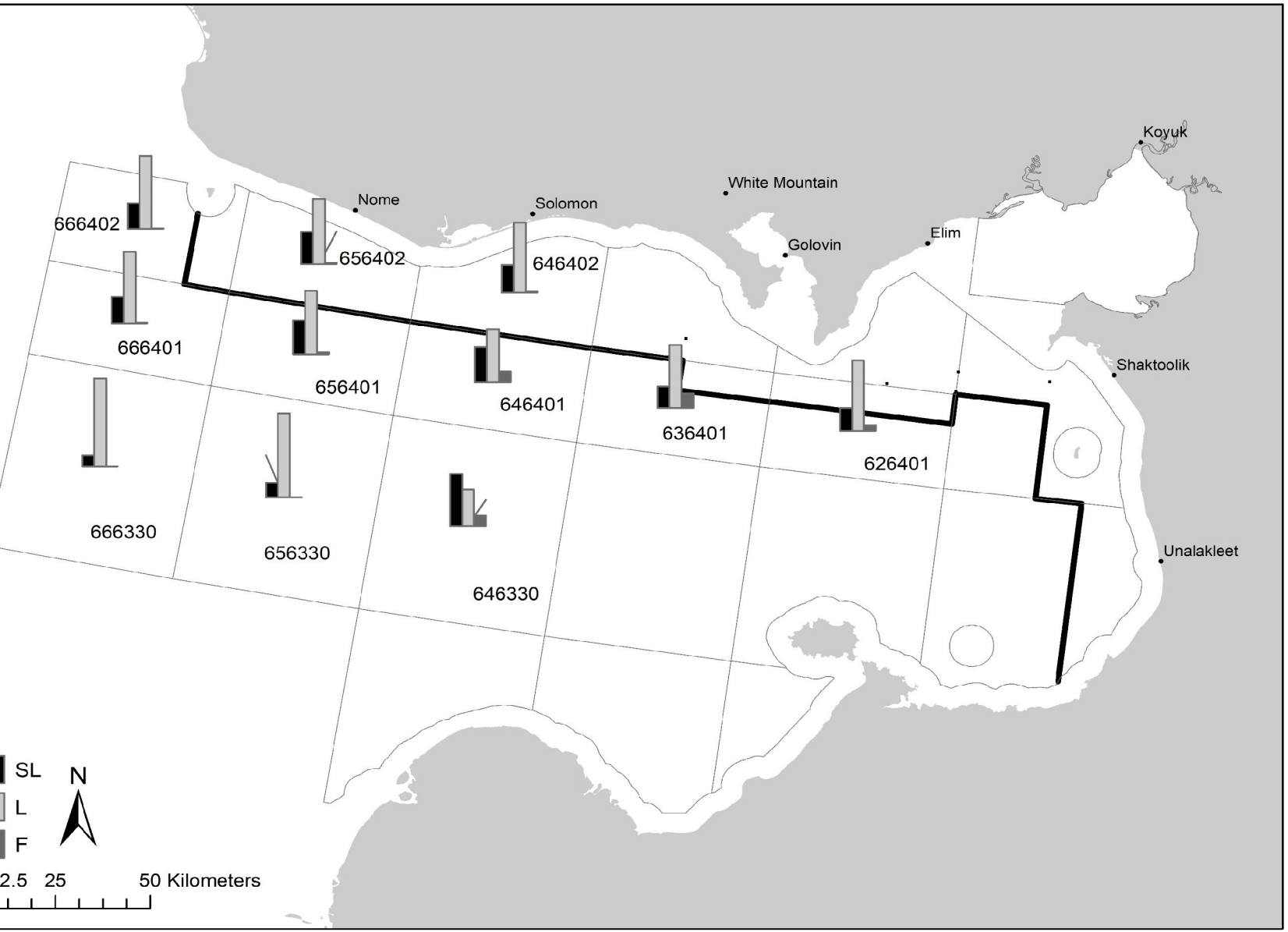




Pot composition f
observer data,
2012-2014



Pot composit
observer data
2012-2017

Length distribution of spring tagged crab 2012-2014