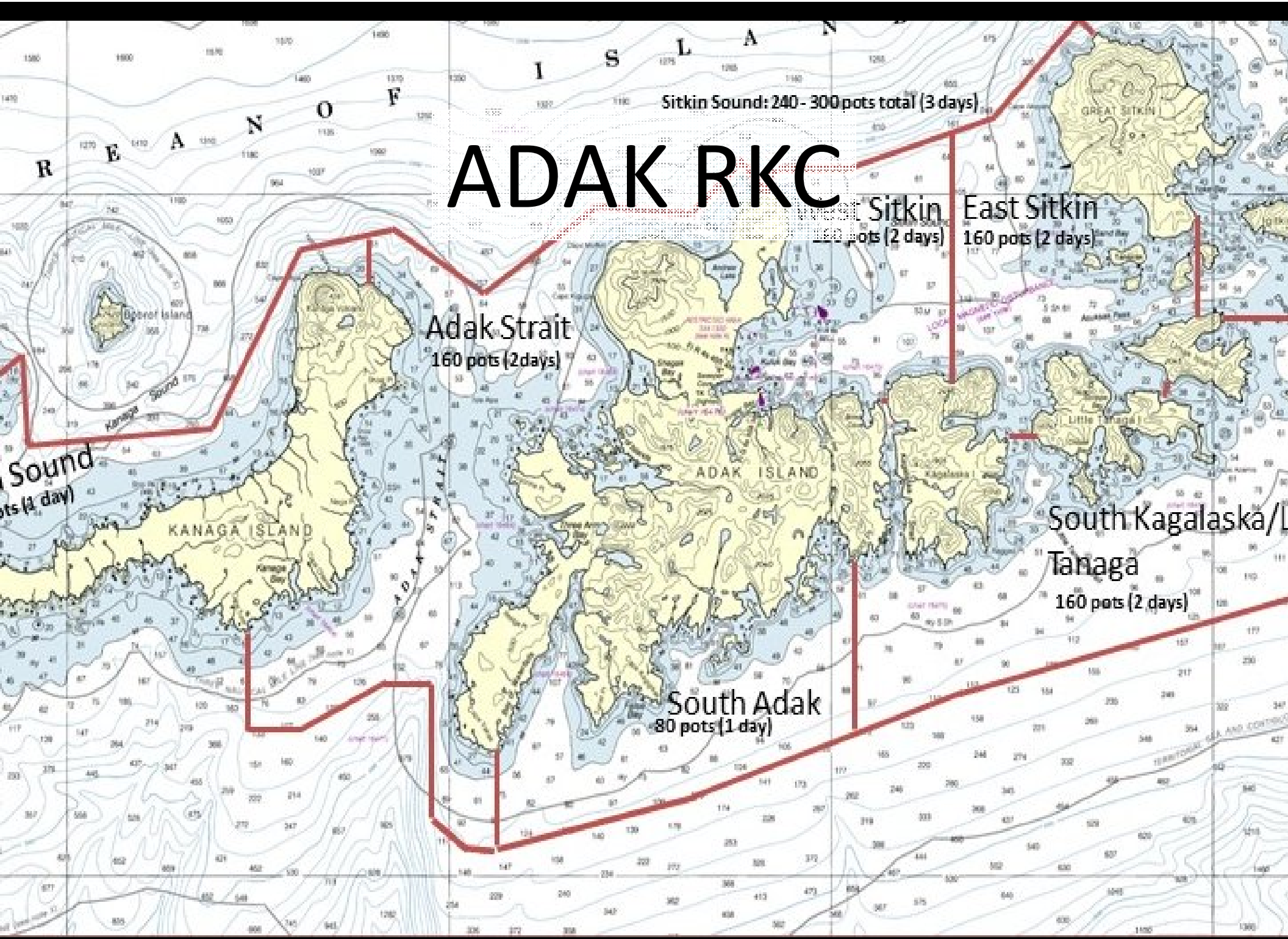
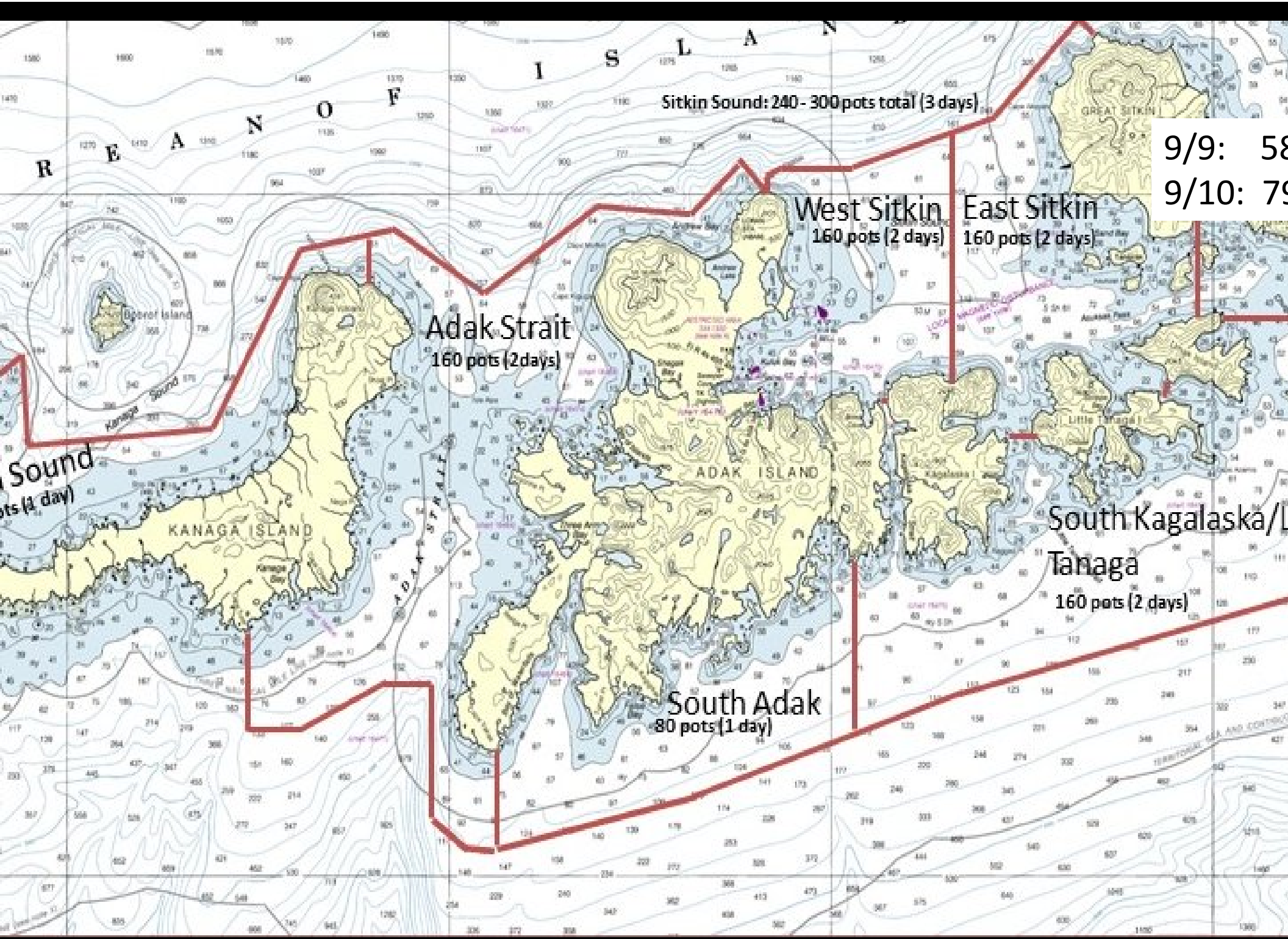

ADAK RKC
Sitkin Sound: 240 - 300 pots total (3 days)
West Sitkin
pots (2 days)
East Sitkin
160 pots (2 days)
Adak Strait
160 pots (2days)
Sound
pots (1 day)
KANAGA ISLAND
ADAK ISLAND
South Kagalaska/
Tanaga
160 pots (2 days)
South Adak
80 pots (1 day)


Sitkin Sound: 240 - 300 pots total (3 days)
9/9: 58
9/10: 79
West Sitkin
160 pots (2 days)
East Sitkin
160 pots (2 days)
Adak Strait
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160 pots (2 days)
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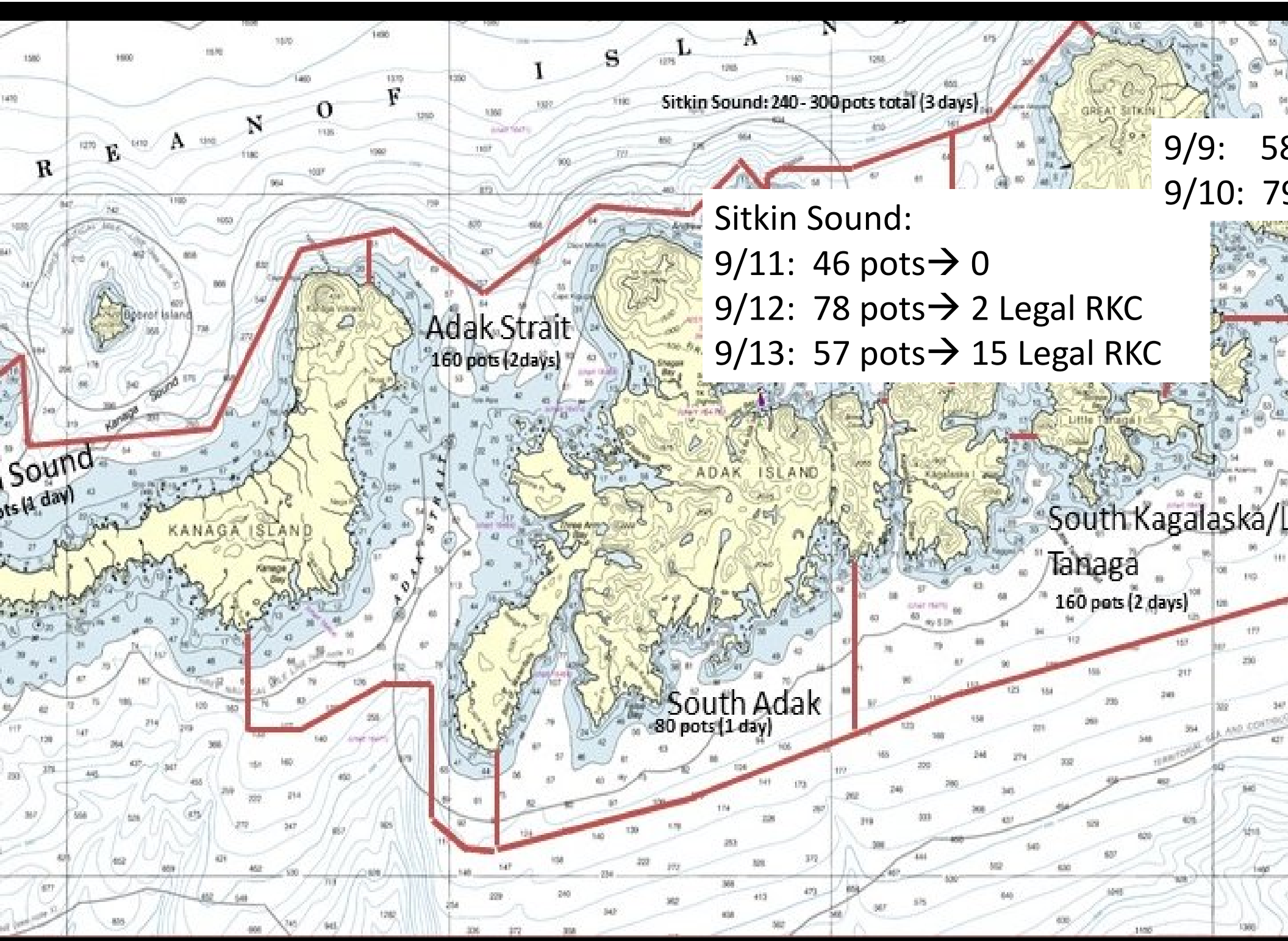
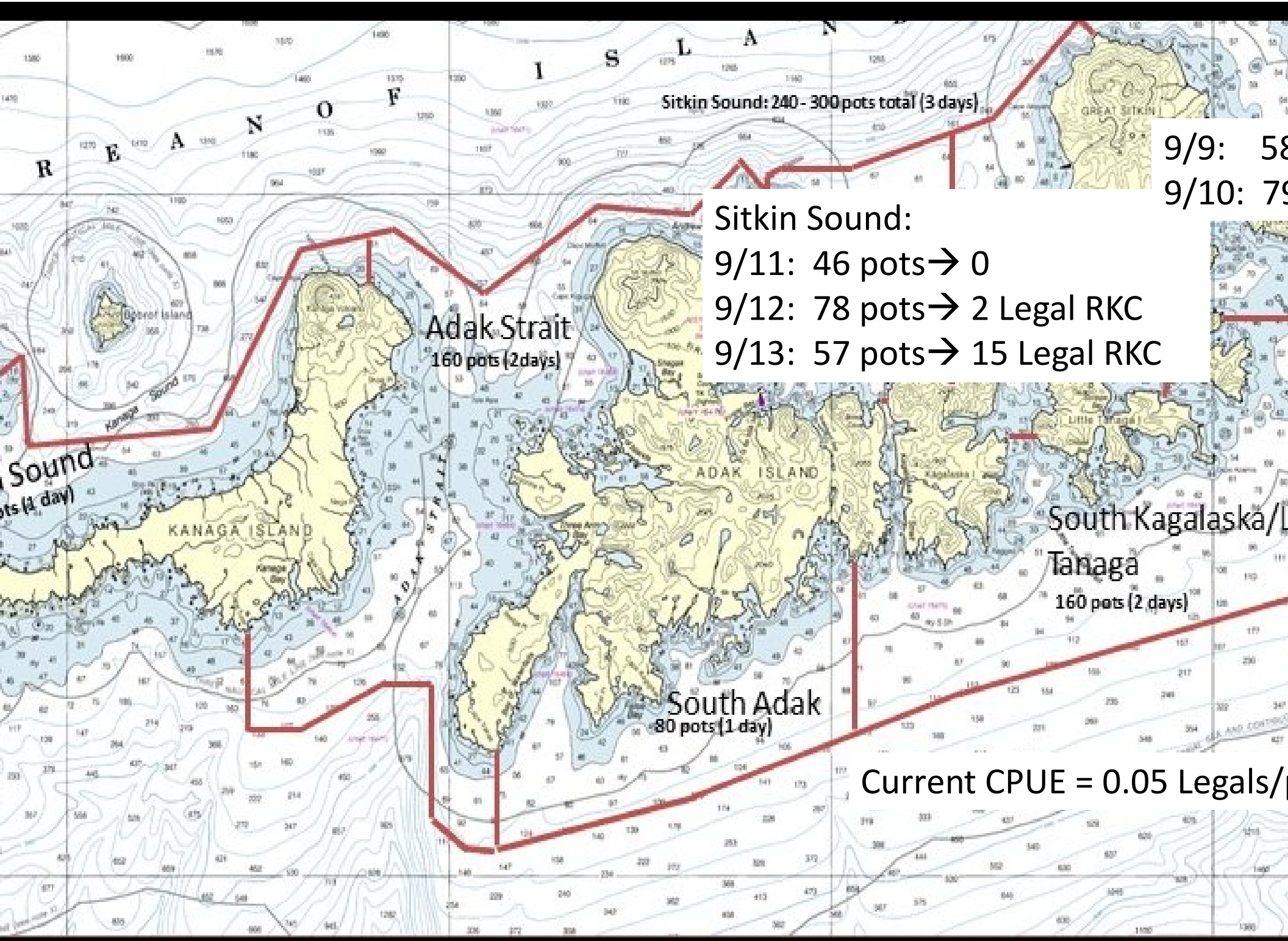
80 pots (1 day)


Sitkin Sound: 240 - 300 pots total (3 days)
9/9: 58
9/10: 79
Sitkin Sound:
9/11: 46 pots→ 0
9/12: 78 pots→ 2 Legal RKC
9/13: 57 pots→ 15 Legal RKC
Adak Strait
160 pots (2 days)
ADAK ISLAND
KANAGA ISLAND
South Kagalaska/
Tanaga
160 pots (2 days)
South Adak
80 pots (1 day)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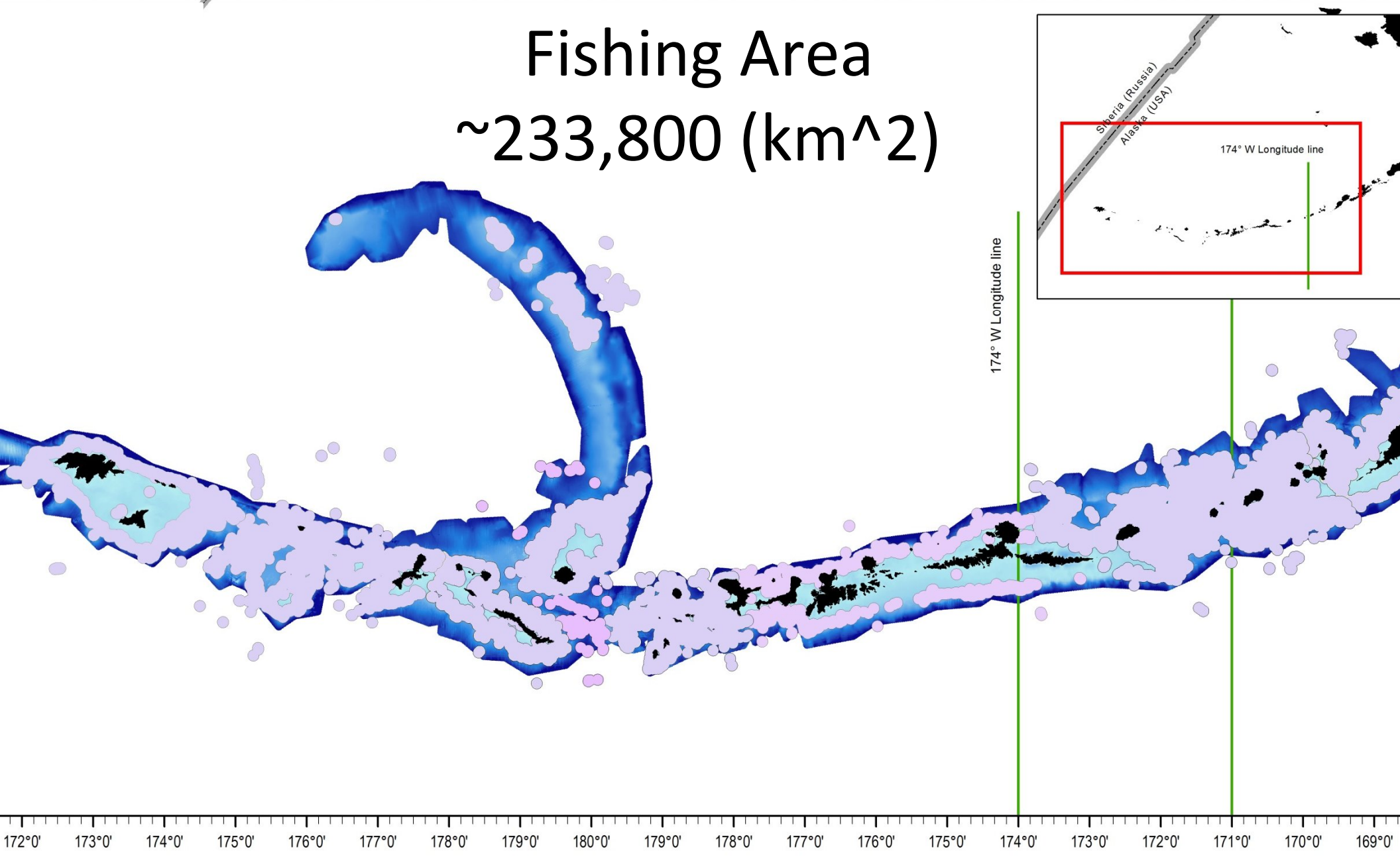
Adak Strait
160 pots (2 days)
ADAK ISLAND
KANAGA ISLAND
South Kagalaska/
Tanaga
160 pots (2 days)
South Adak
80 pots (1 day)
Current CPUE = 0.05 Legals/

Aleutian Island GKC

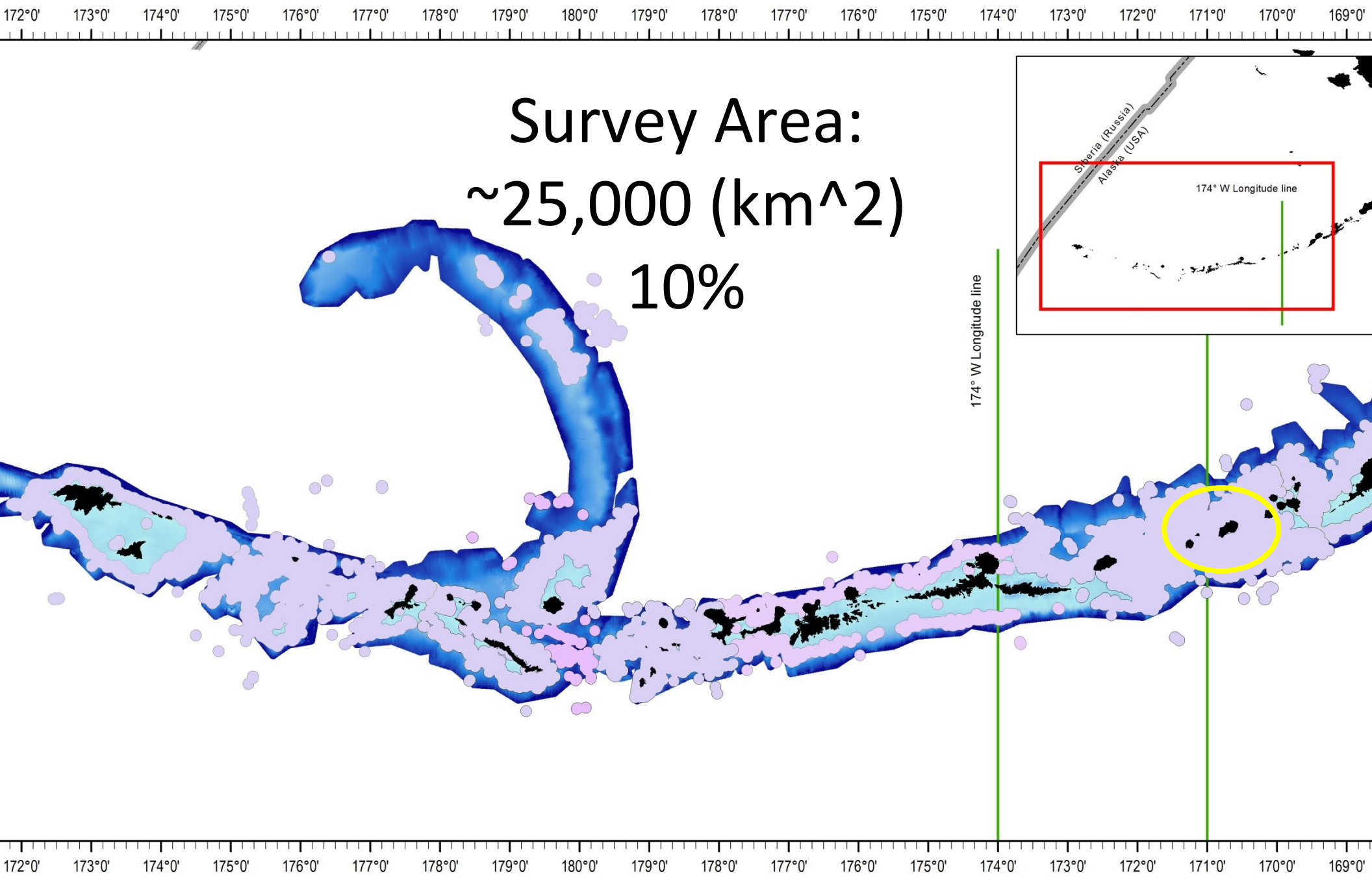
"Stock Assessment" based on average historical catch
(~6 million lbs): Tier 5 (lowest)
Triennial Survey, Fishery observer data
Not consistent, potentially biased
Population model using observer data
Potential bias due to observer data
Can we Design a Cooperative survey?
(Consistent and unbiased survey)

Fishing Area
~233,800 (km^2)



What's the problem?

- Area
  - Sampling design
    - Spatial extent
    - Accuracy/Precision
    - Cost Effective


172°0'
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177°0'
176°0'
175°0'
174°0'
173°0'
172°0'
171°0'
170°0'
169°0'
Survey Area:
~25,000 (km^2)
10%
Siberia (Russia)
Alaska (USA)
174° W Longitude line
174° W Longitude line

ADF&G Triennial Survey

Cost:

5 FB II (salary/seaduty/benefits) for 28days

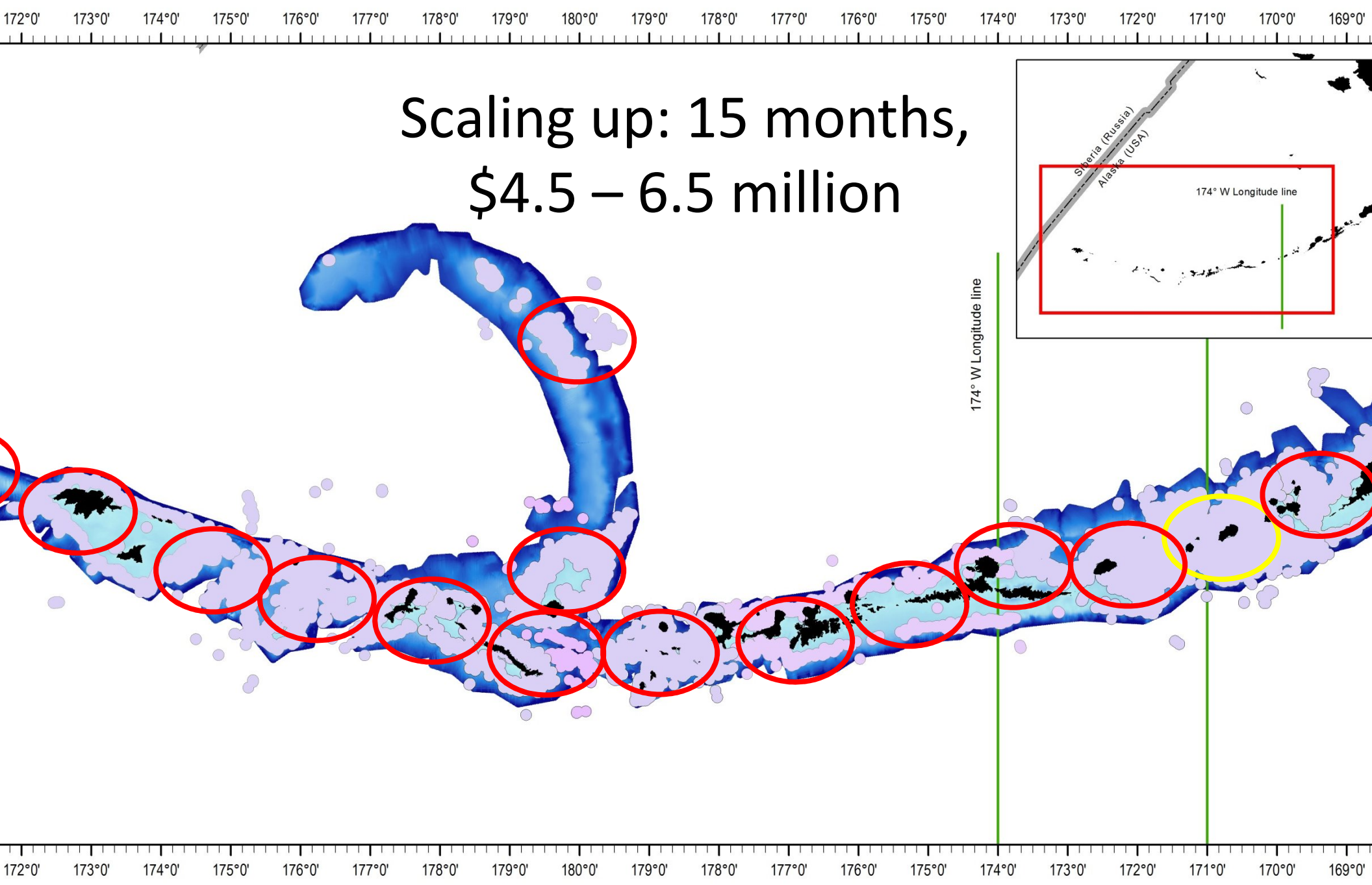
30K/person = 150K

(150 biologist days)

Vessel charter: wanted 10K/day = 280K

Total Cost: ~430K

Scaling up: 15 months, $4.5 – 6.5 million



Cost due to area too great

So use next best (only) thing for index of abundance: Fishery observer data

Observer data

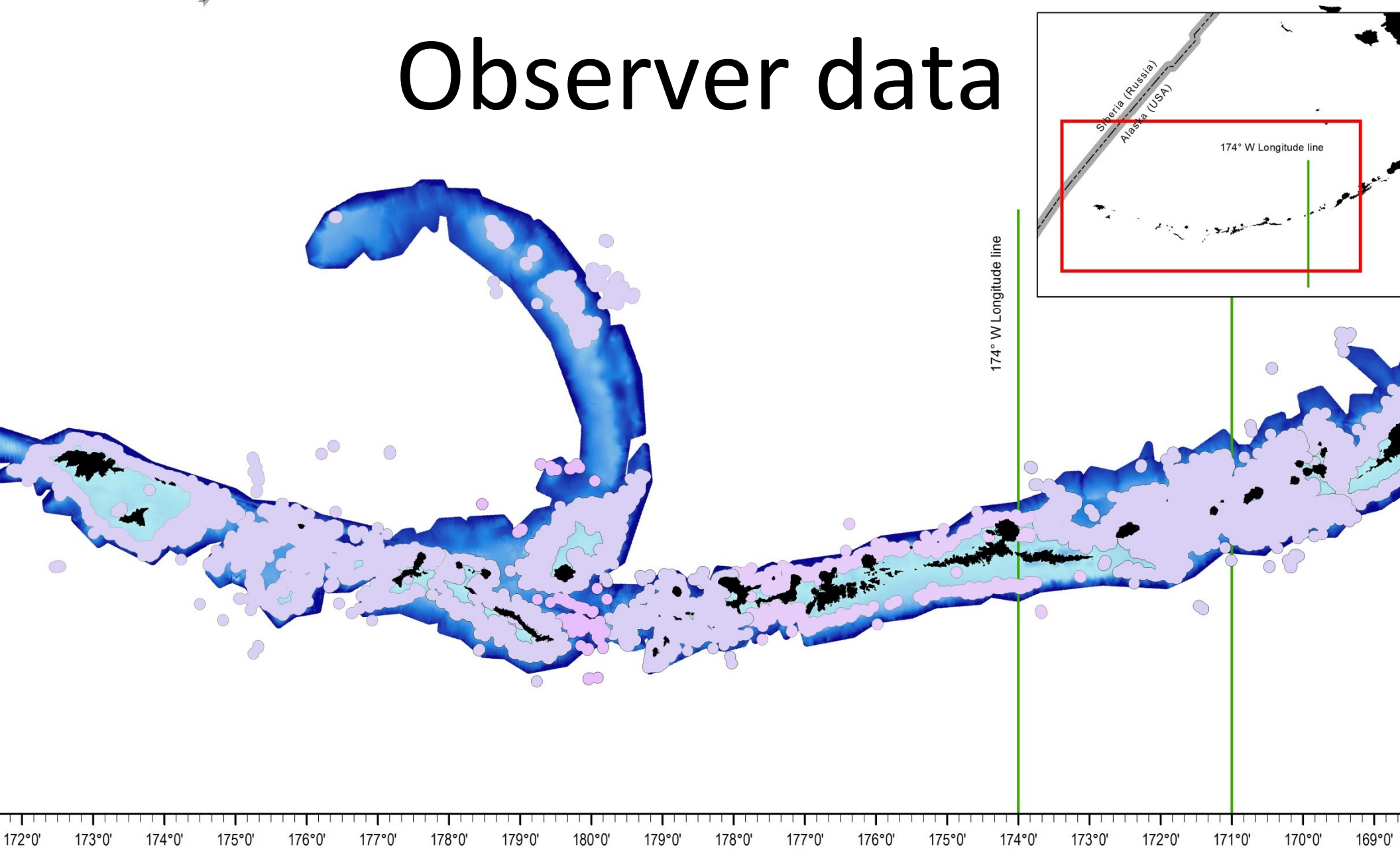
Fishery Dependent

- Fishing “hotspots”
  - hyper-stability / independence
- Variable gear, skipper, bait, etc

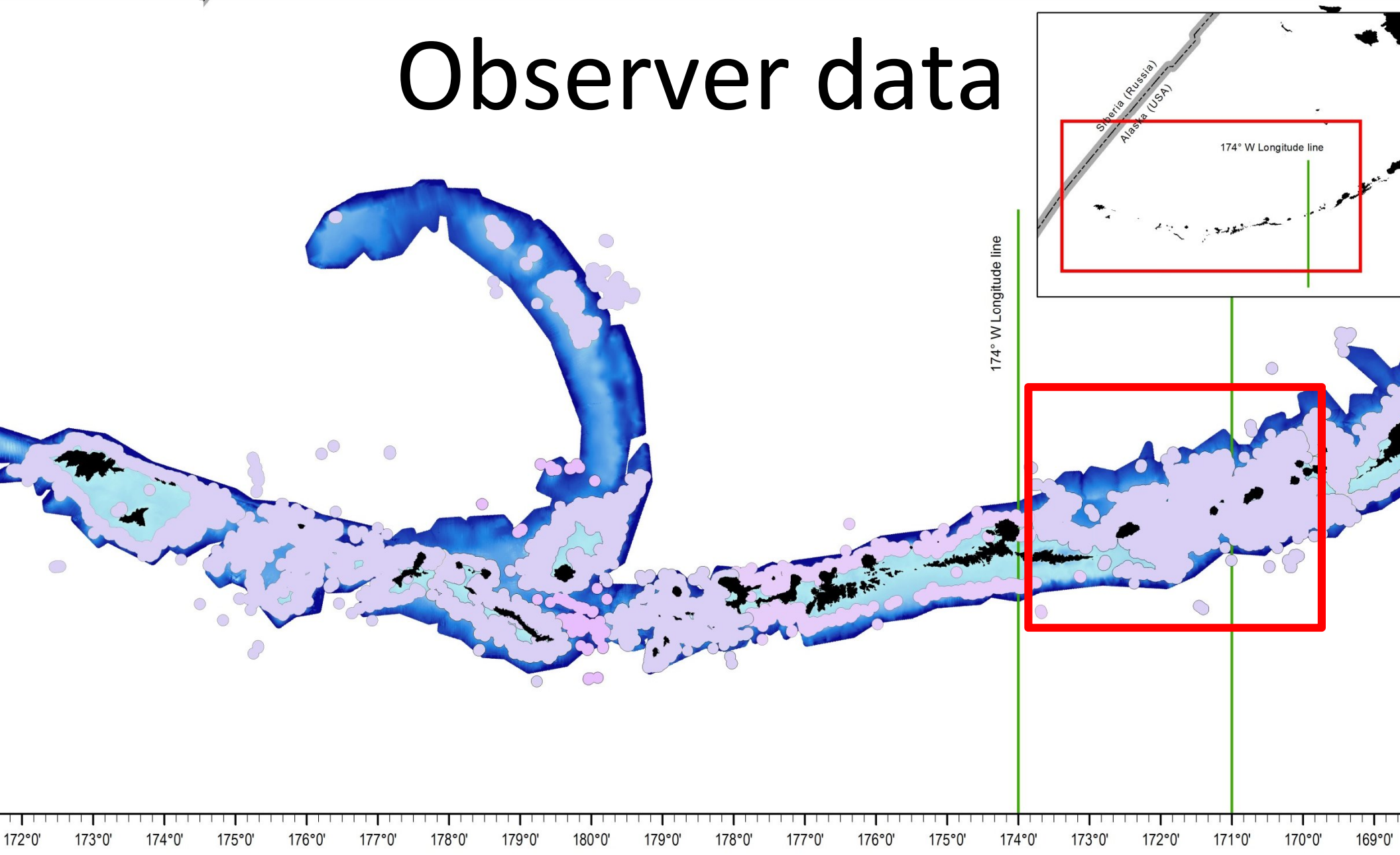
Standardized CPUE

- Best with what we have

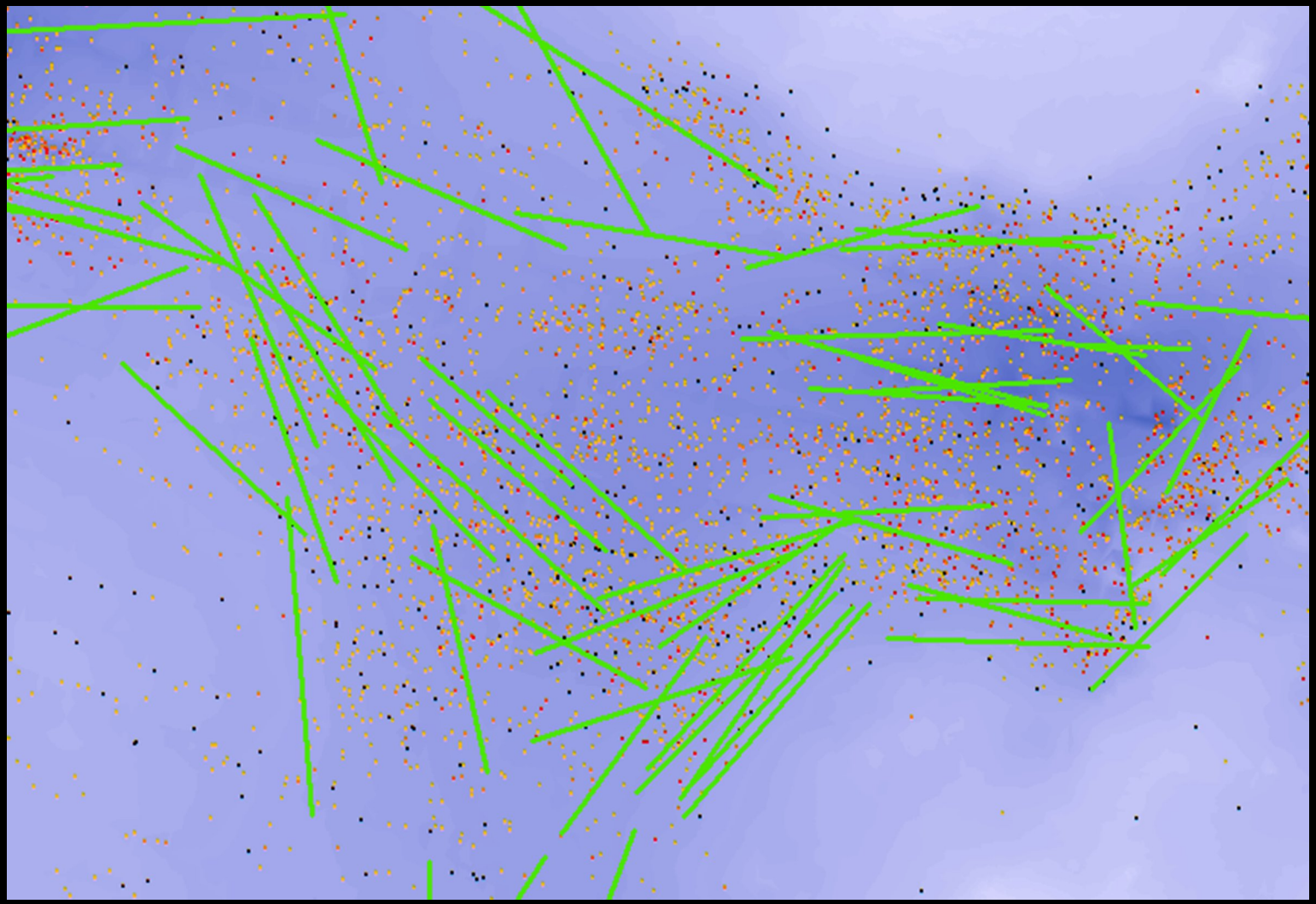
Observer data



Observer data

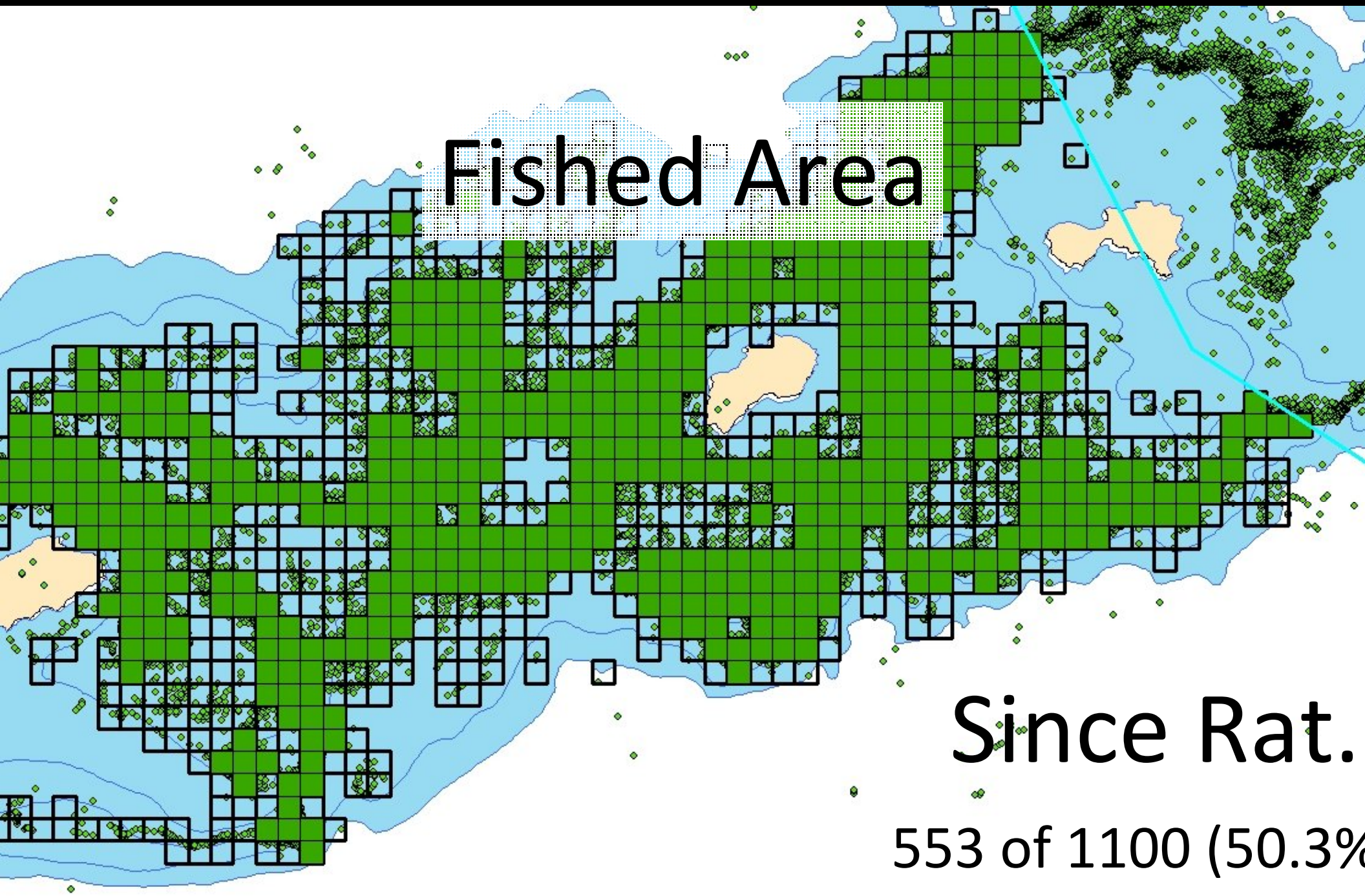


String locations

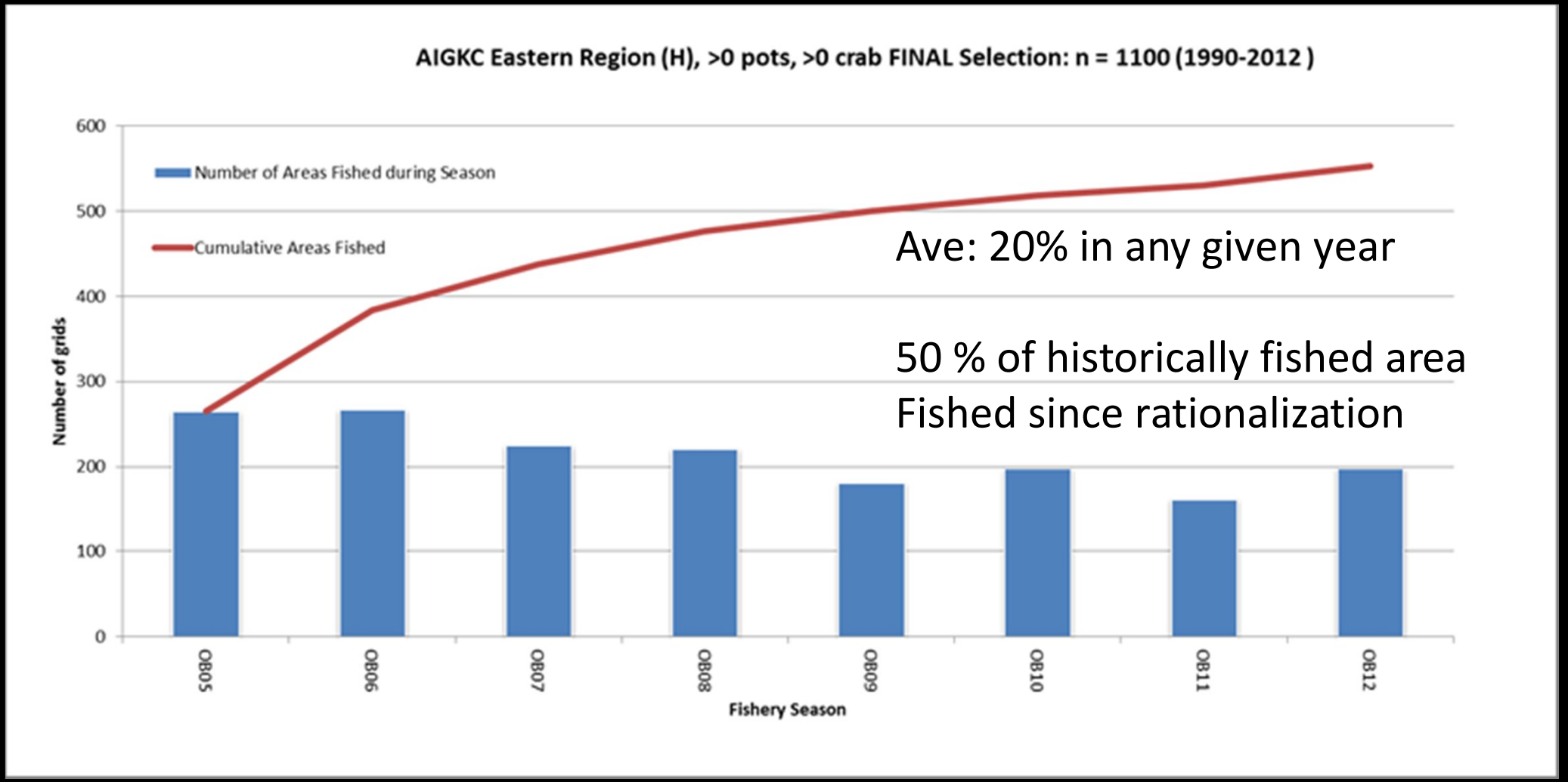


High ove
Confirm
Non-ind

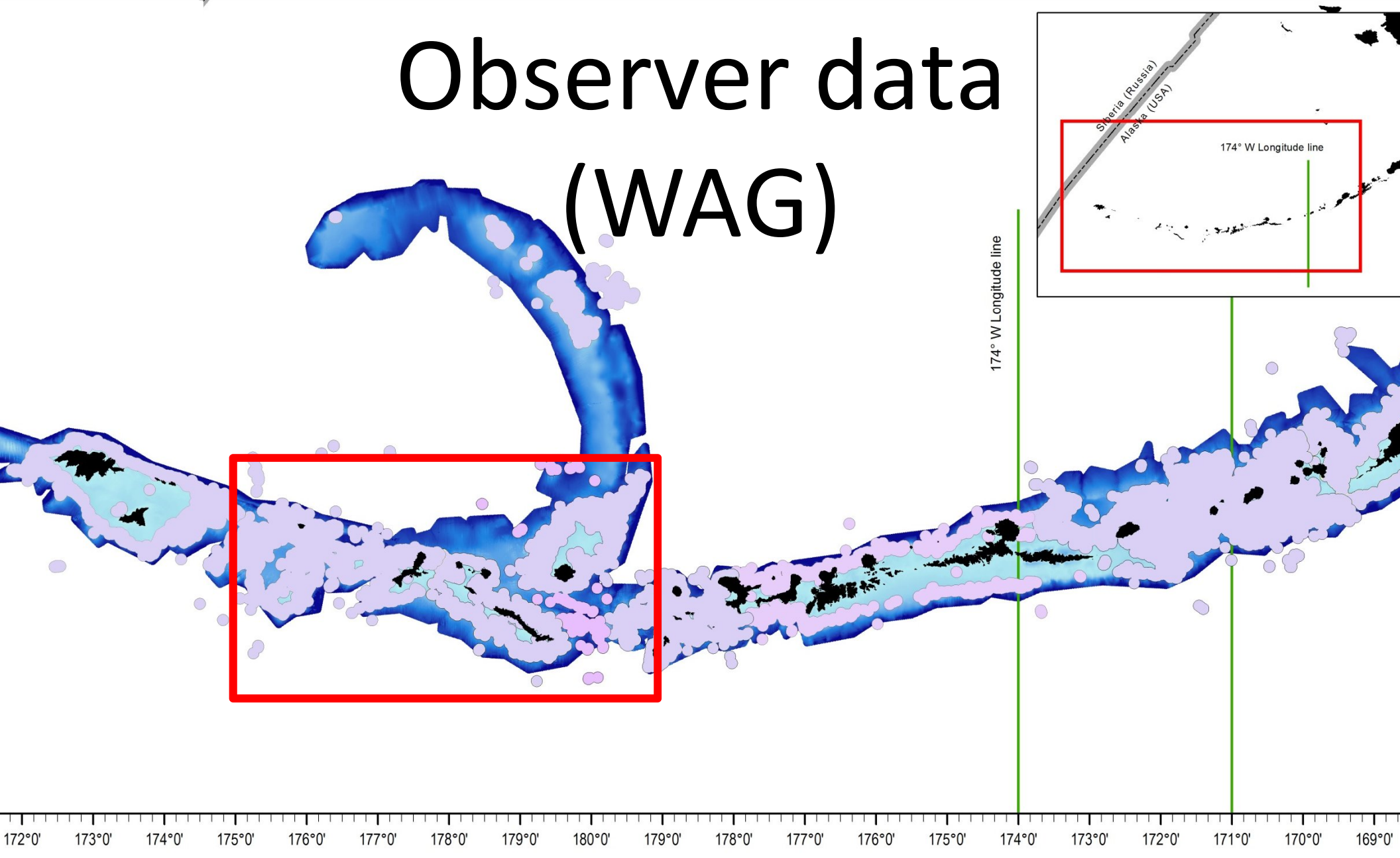
n ≠ 400
CVs bias


Fished Area
Since Rat.
553 of 1100 (50.3%

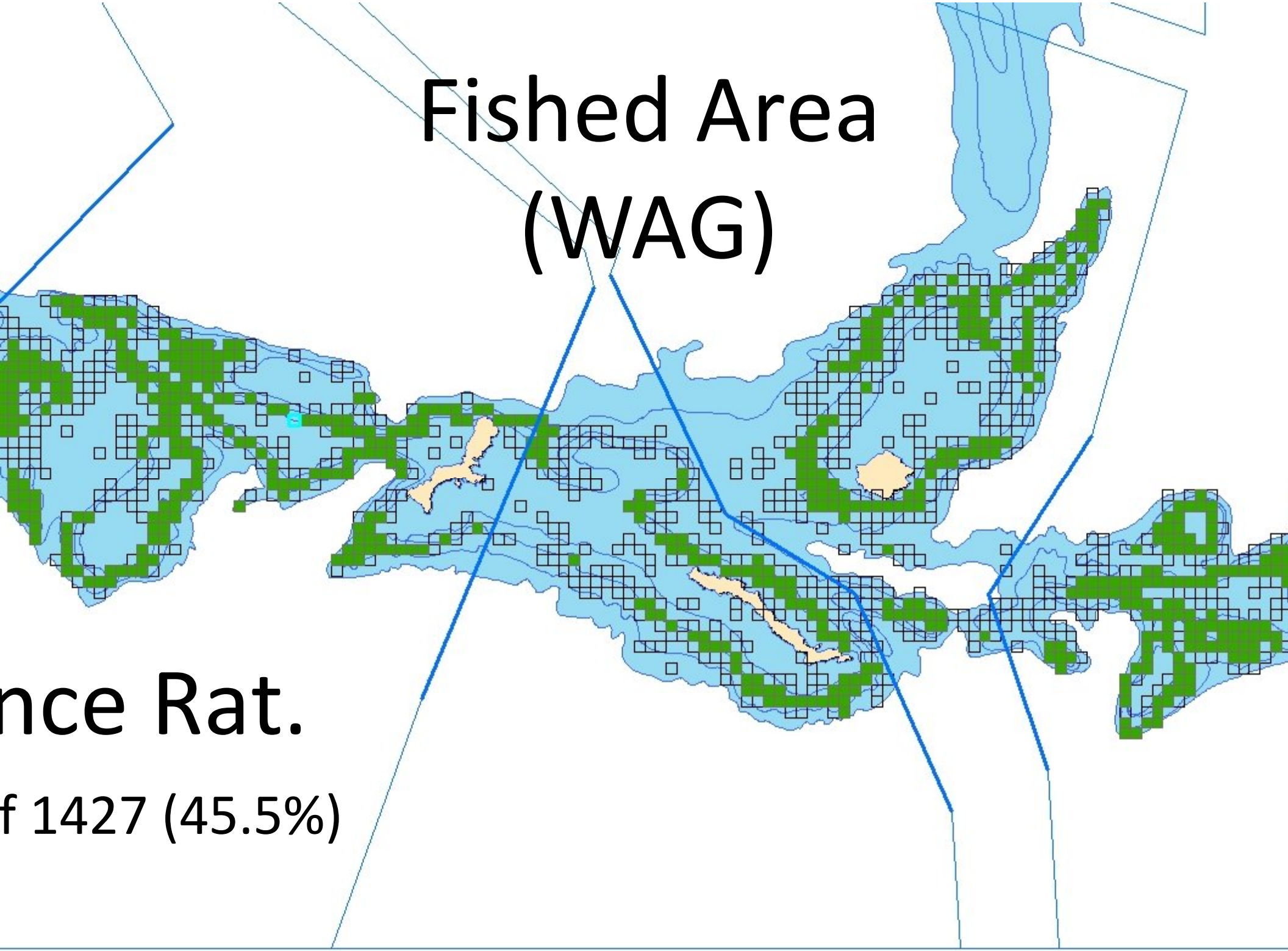
Fished Area


AIGKC Eastern Region (H), >0 pots, >0 crab FINAL Selection: n = 1100 (1990-2012)
Number of Areas Fished during Season
Cumulative Areas Fished
Number of grids
600
500
400
300
200
100
0
OB05
OB06
OB07
OB08
OB09
OB10
OB11
OB12
Fishery Season
Ave: 20% in any given year
50 % of historically fished area
Fished since rationalization

Observer data (WAG)



Fished Area (WAG)



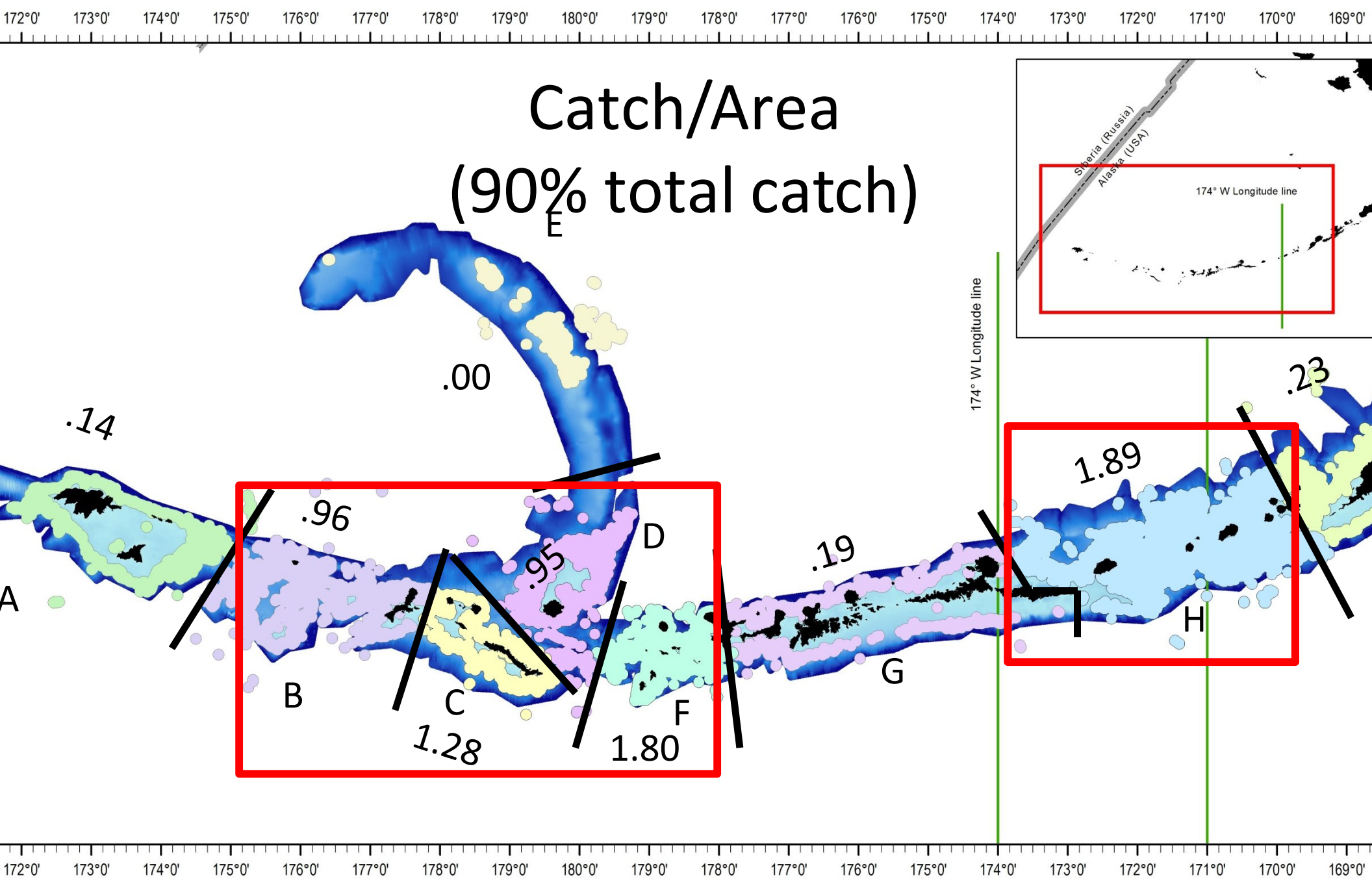
nce Rat.

f 1427 (45.5%)

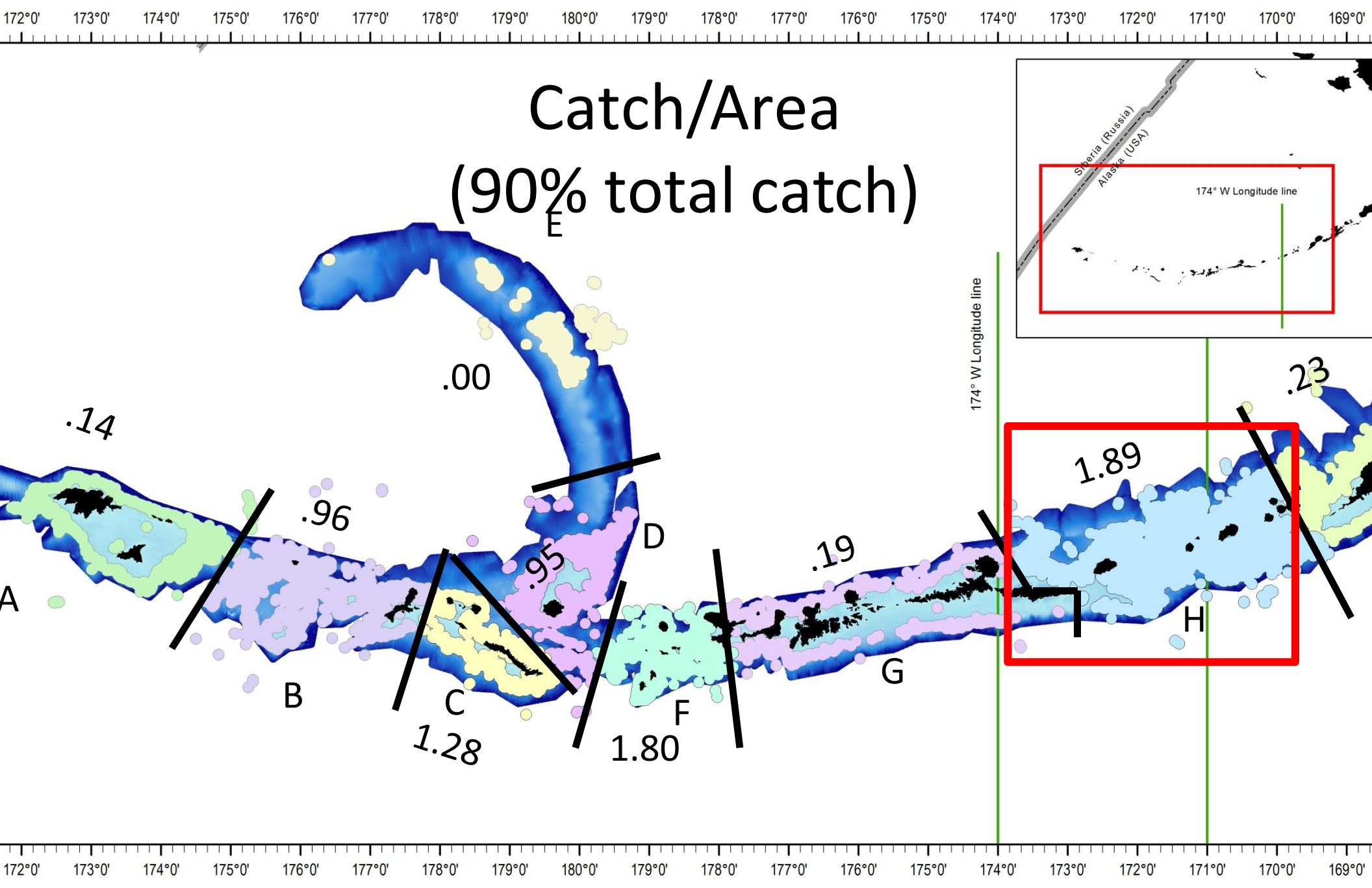
Cooperative Survey?

Improve spatial extent
Reduce potential for hyperstability
Provide consistent data long-term
Cost effective

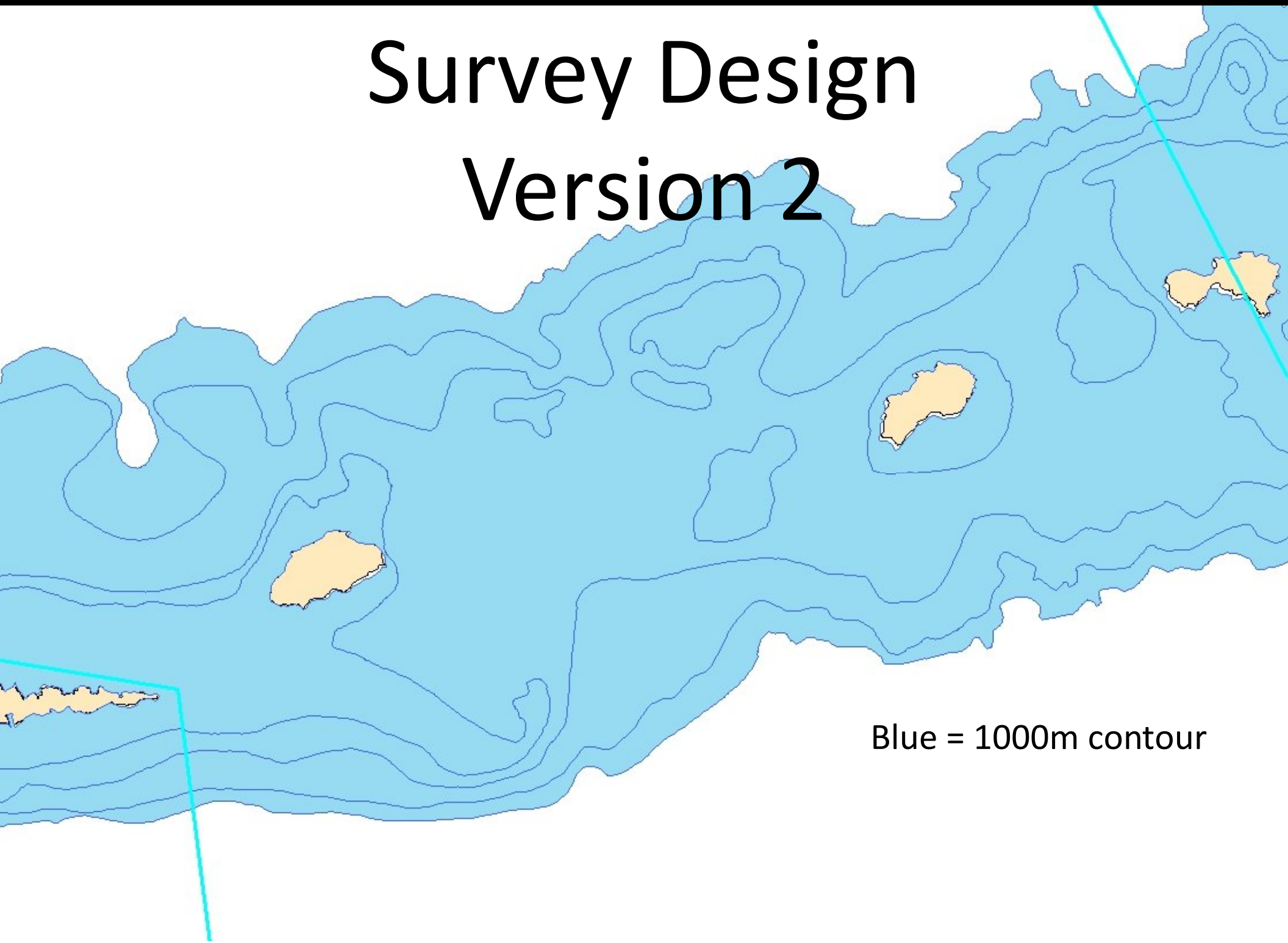
Catch/Area
(90% total catch)



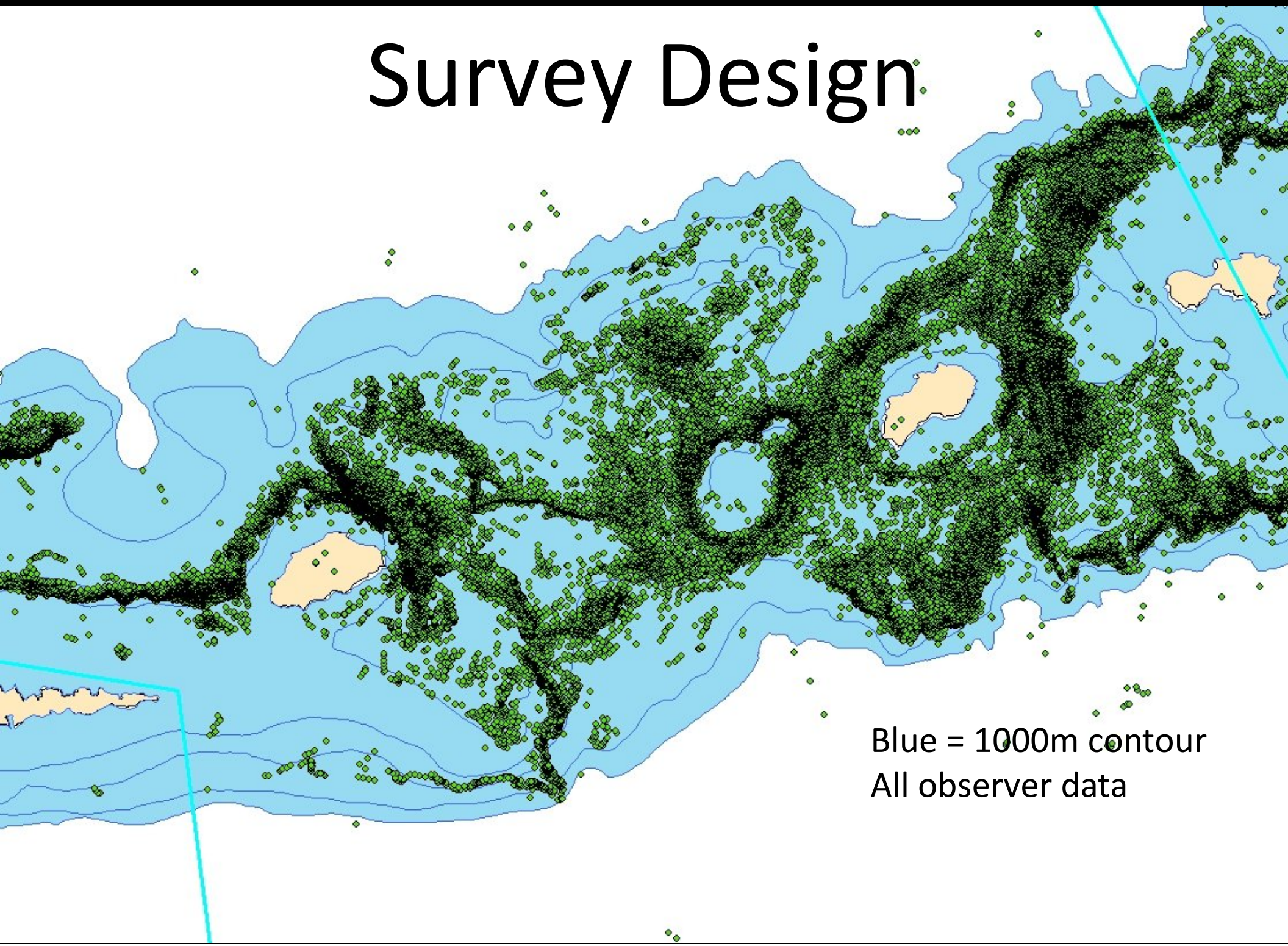
Catch/Area
(90% total catch)



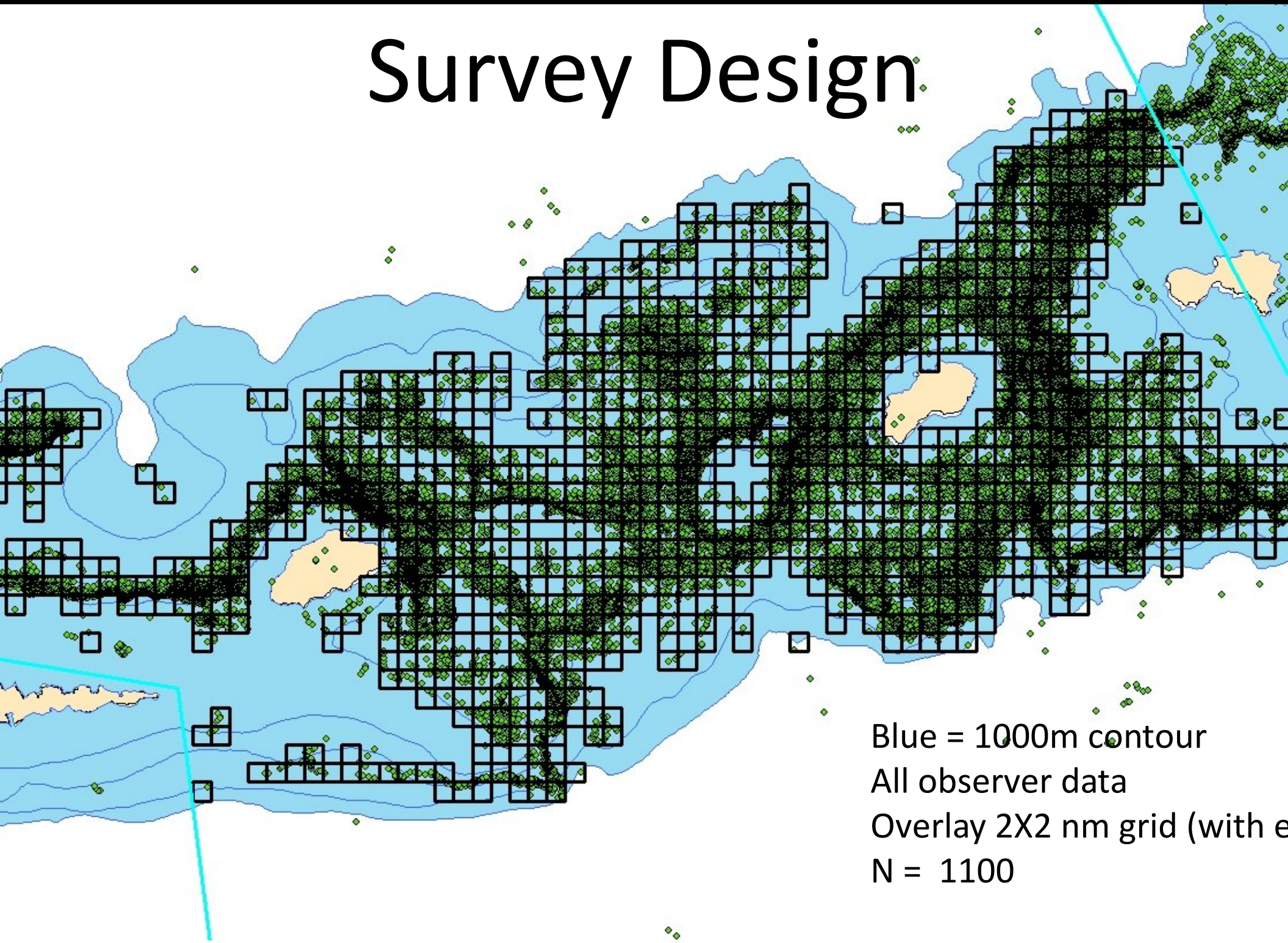
Survey Design Version 2



Survey Design

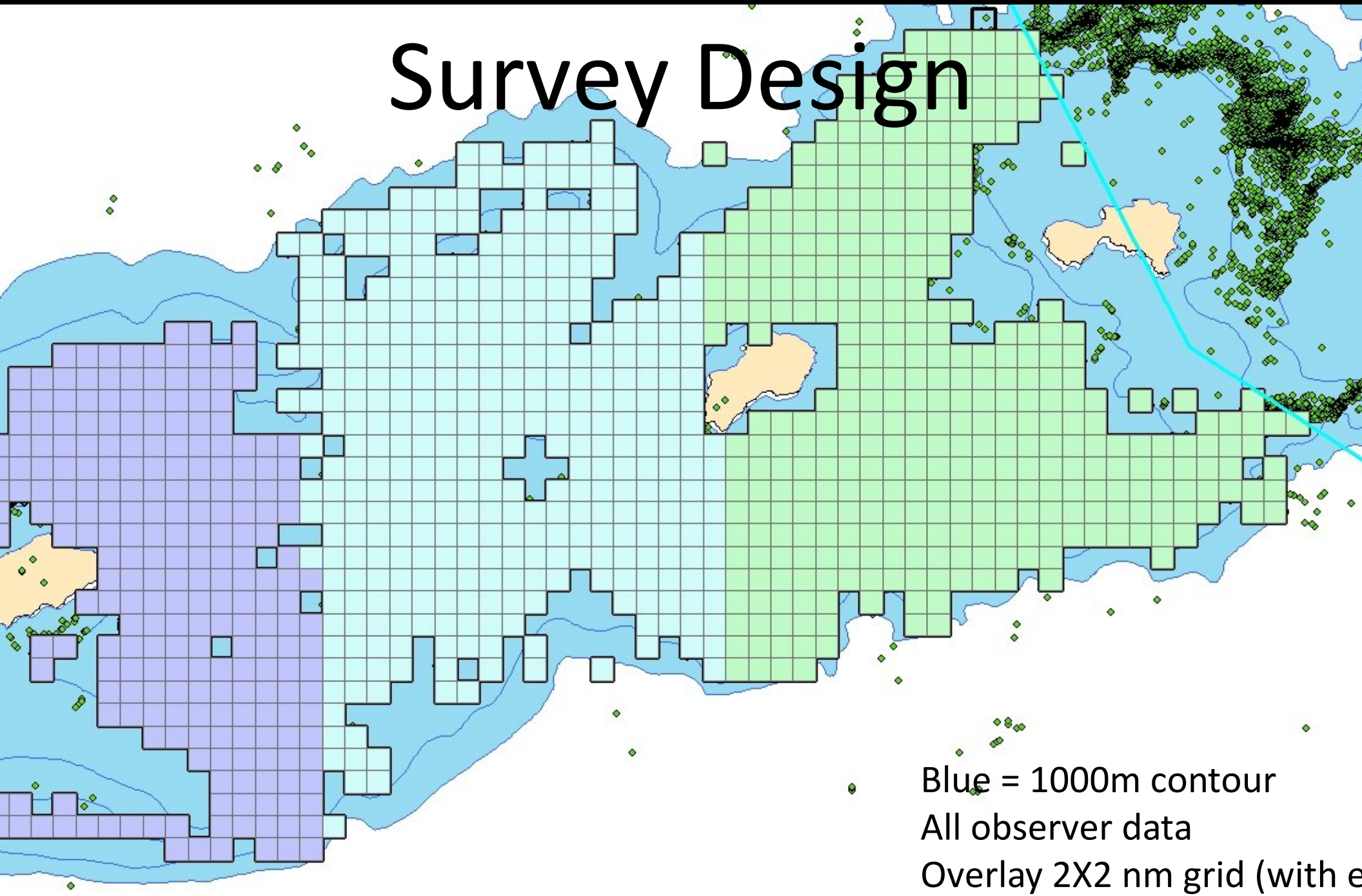


Survey Design



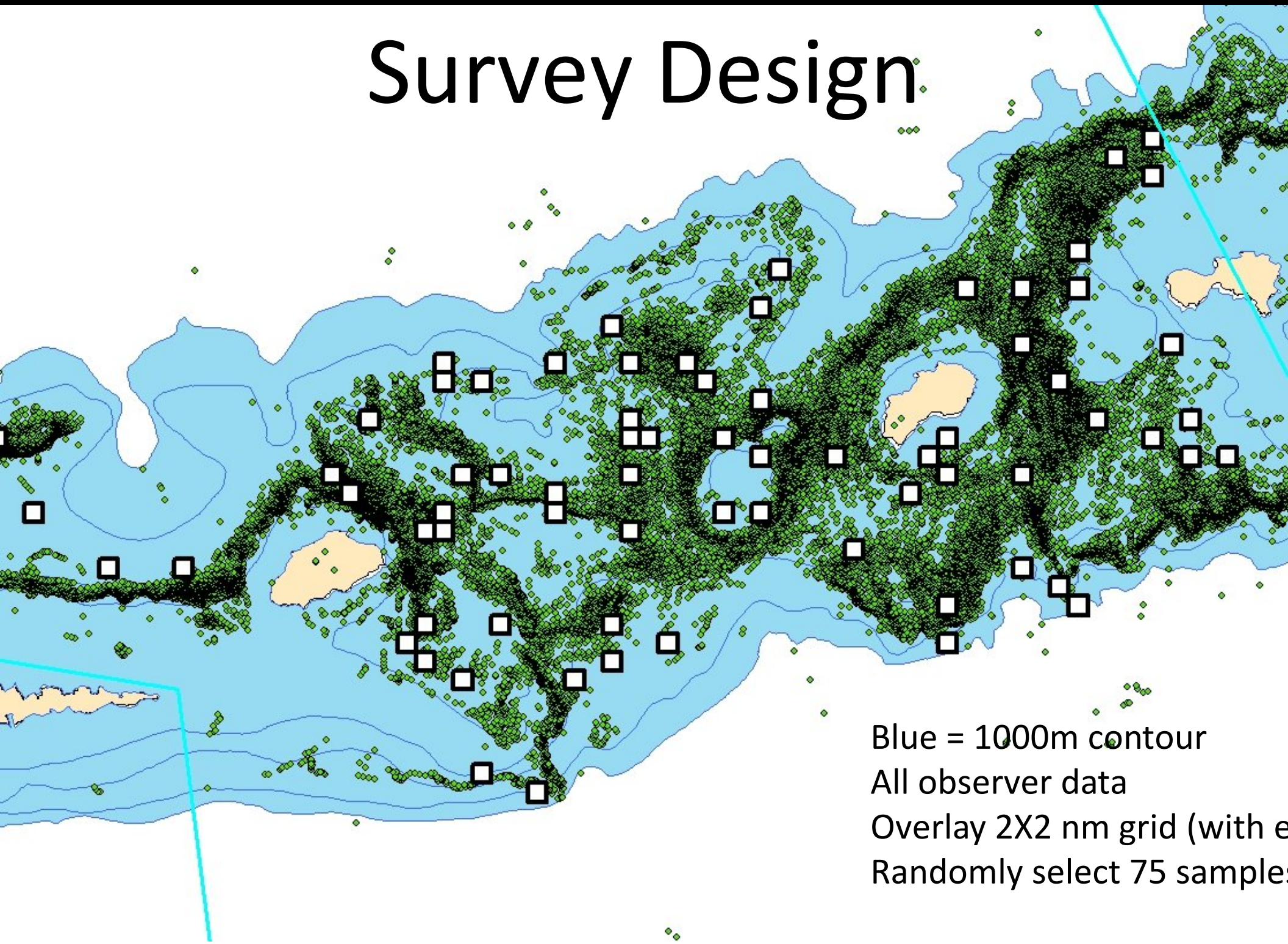
Blue = 1000m contour
All observer data
Overlay 2X2 nm grid (with e
N = 1100

Survey Design



Blue = 1000m contour
All observer data
Overlay 2X2 nm grid (with e
Stratified by area (3 equal si

Survey Design



Blue = 1000m contour
All observer data
Overlay 2X2 nm grid (with e
Randomly select 75 sample

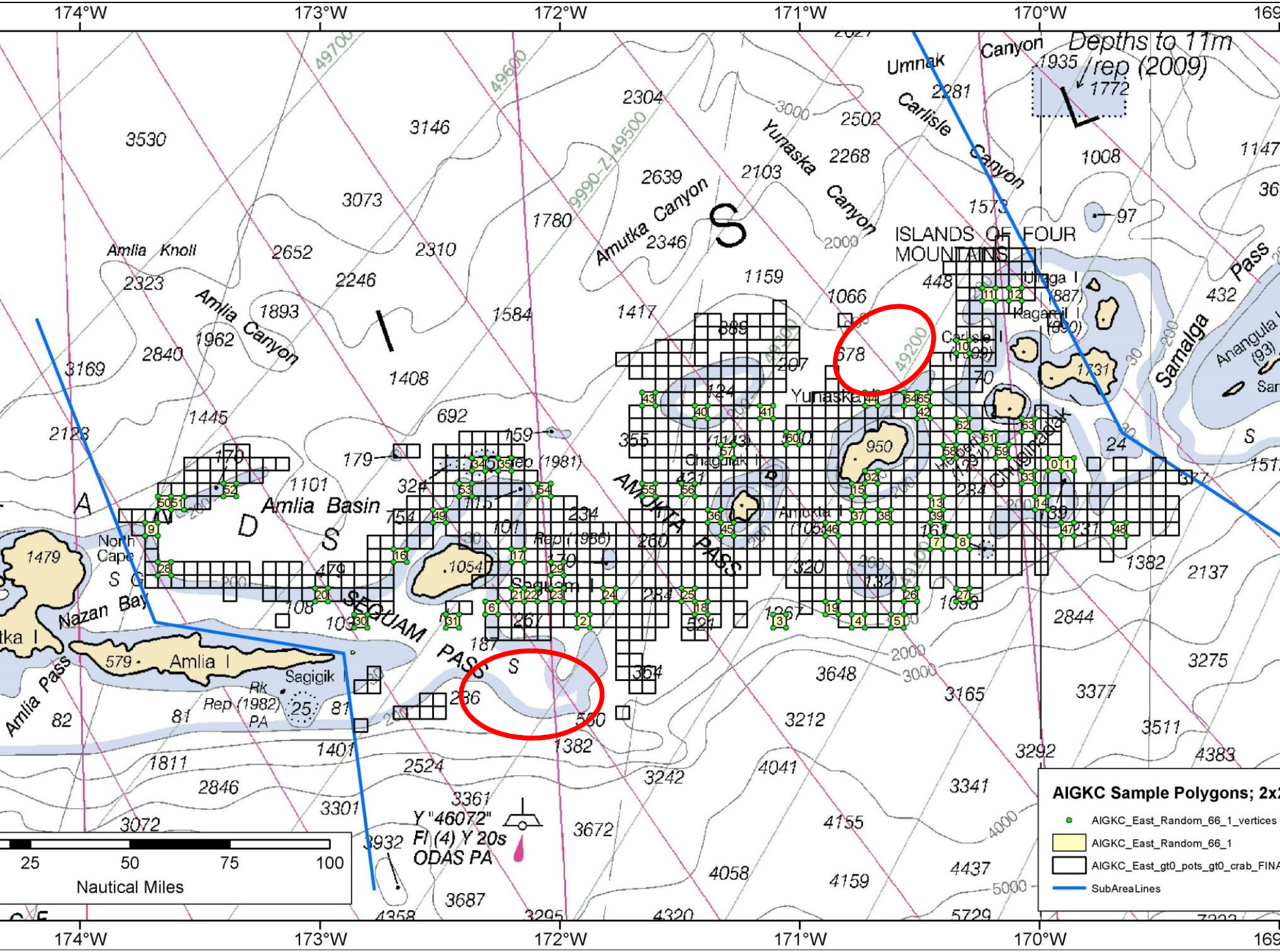
Reality

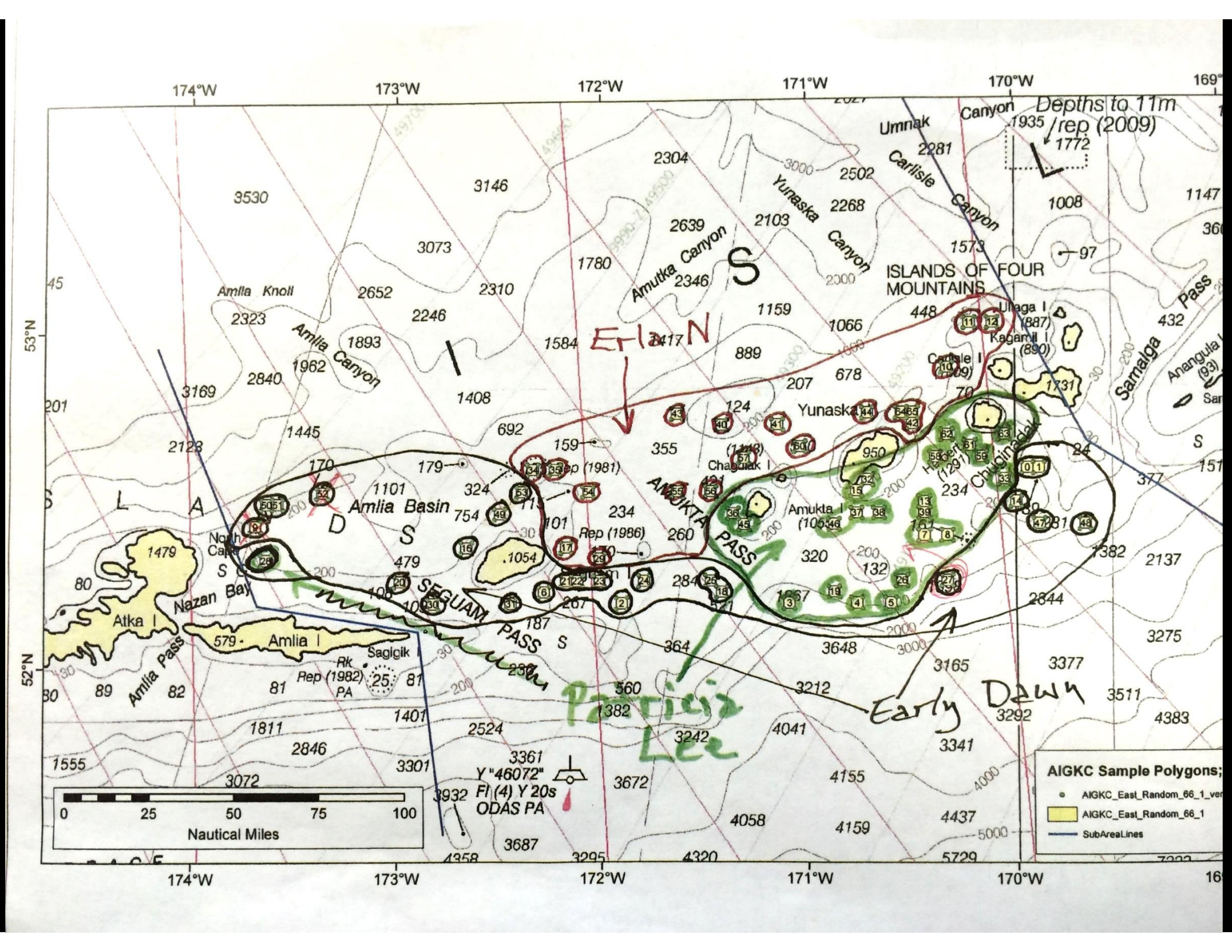
High Trawl areas excluded

n = 66 (22/vessel)

Erla N modified (shortened) strings in non-core areas

Runs 50 pot strings.


174°W
173°W
172°W
171°W
170°W
Depths to 11m
/rep (2009)
Umnak
Canyon
Carlisle
Canyon
Yunaska
Canyon
Amutka Canyon
Amlia Knoll
Amlia
Canyon
ISLANDS OF FOUR
MOUNTAINS
Samalga
Pass
Amlia Basin
AMUTKA PASS
SEQUAM PASS
Amlia Pass
North
Cape
Nazan Bay
Amlia I
Sagigik I
Rk
Rep (1982)
PA
Rep (1981)
Rep (1966)
Yunaska I
Chagulak I
Amutka I
Carlisle I
Kagamil I
Umnga I
Y "46072"
Fl (4) Y 20s
ODAS PA
25
50
75
100
Nautical Miles
AIGKC Sample Polygons; 2x
AIGKC_East_Random_66_1_vertices
AIGKC_East_Random_66_1
AIGKC_East_gt0_pots_gt0_crab_FINA
SubAreaLines


174°W
173°W
172°W
171°W
170°W
53°N
52°N
Depths to 11m
rep (2009)
Umnak Canyon
Carlisle Canyon
Yunaska Canyon
Amutka Canyon
Amlia Canyon
Amlia Knoll
ISLANDS OF FOUR MOUNTAINS
Samalga Pass
Yunaska
Chuginadak
Amukta I
Amukta Pass
Seguam Pass
Amlia Basin
Amlia I
Atka I
Nazan Bay
Amlia Pass
Sagigik
Rep (1981)
Rep (1986)
Rep (1982)
Y "46072"
Fl (4) Y 20s
ODAS PA
Patricia Lee
Early Dawn
0 25 50 75 100
Nautical Miles
AIGKC Sample Polygons;
AIGKC_East_Random_66_1_ver
AIGKC_East_Random_66_1
SubAreaLines

Early Results

y Dawn: 1 staff, 20 strings, 5 pots/string
5666 Total crab, 2077 measured
Lost one string to Trawl fleet (2 others recover
N: 2 staff, 19 strings, 5 pots/string
4352 Total crab, 1414 measured
icia Lee: 2 staff, 18 strings, 7 pots/string
5497 Total crab, 2382 measured

57 strings (321 pots)

Early Results

Spatial Extent:
Covers 95% of EAG (high trawl areas excluded)
Stratified, 2-stage design (data are independent
Still need to examine variance and sample size
Skippers/crew impressed with staff

Early Results

Cost:

5 ADFG(salary/seaduty/benefits/travel) for 14da

~1K/person/day = 70K

Fleet:

Increased fuel cost: TBD

Increased time/effort to catch TAC: TBD

Early Results

Logistically feasible to due Coop survey

Industry, NRC, ADF&G

Cost effective

(150 – 200K to survey EAG + WAG)

Next Steps

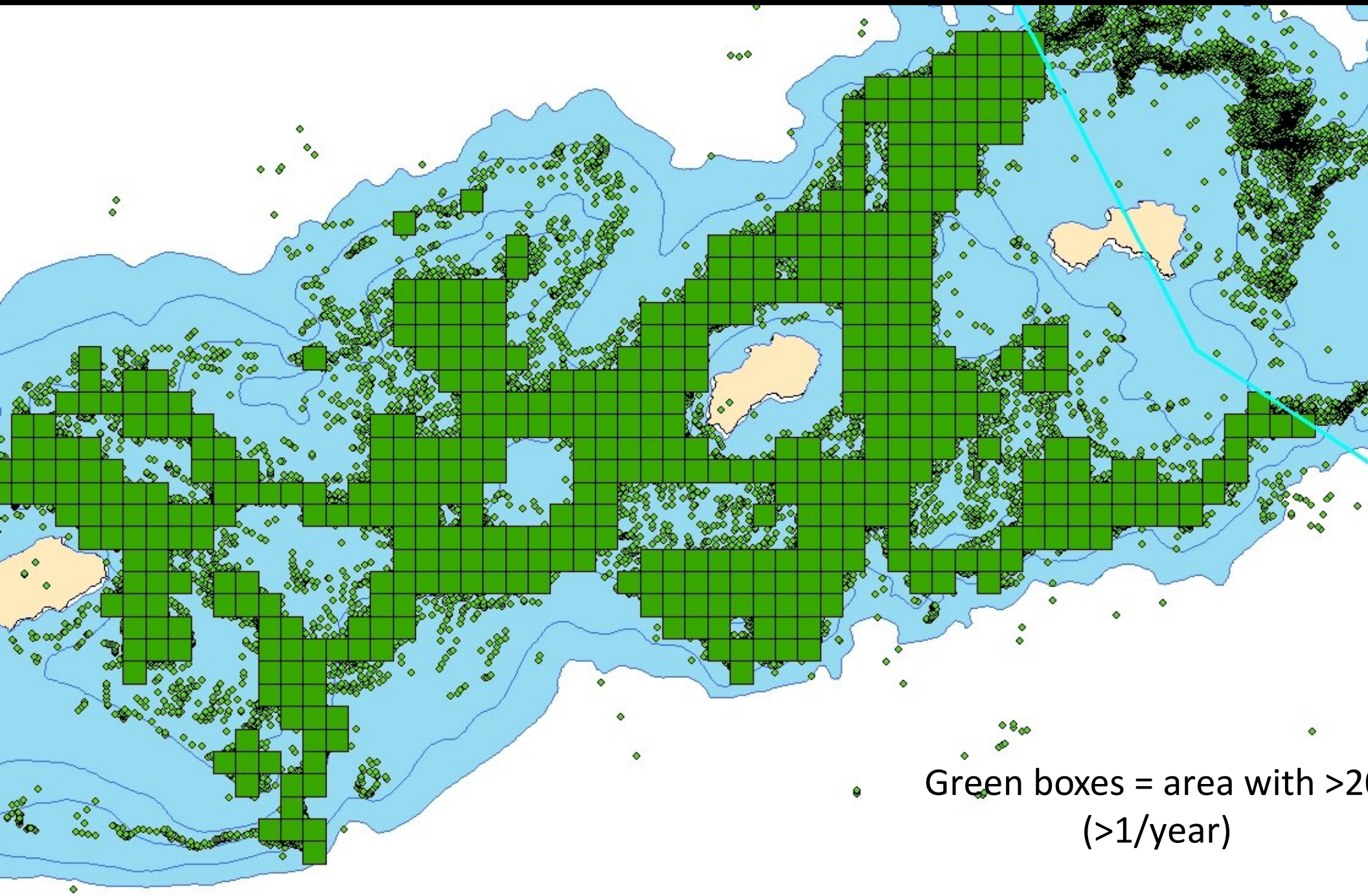
Full debrief with skippers and staff
(improve efficiencies)
Examine within and among string variability
(sample size estimates)
Explore better stratification options
(Skipper, Habitat, Effort)
Initiate in WAG
How/when to integrate into SA
Long-term funding source
Incorporate small-mesh pots

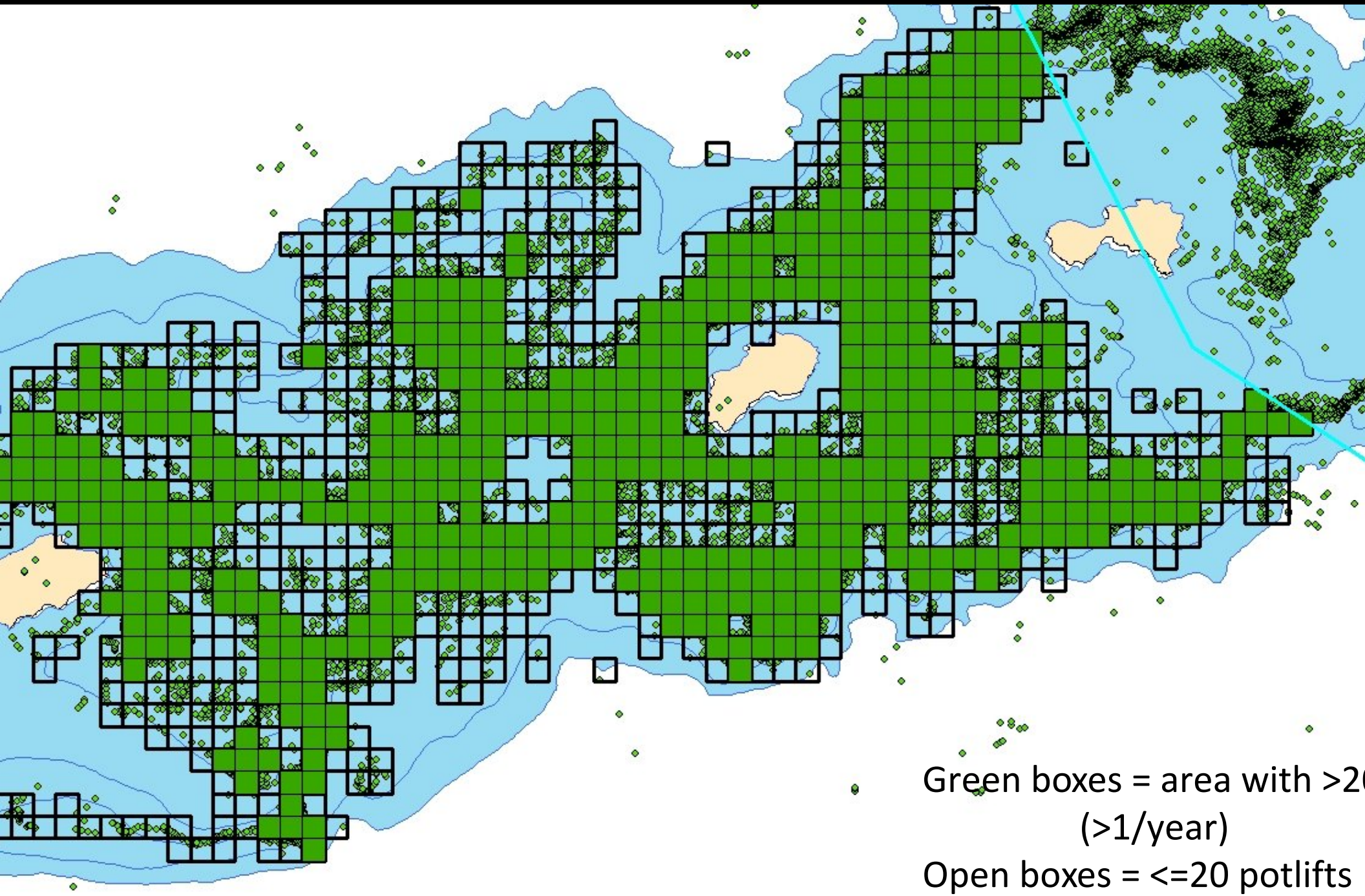
Better Stratification?

Area: Spreads effort out, reduces clumping

Habitat: Ideal, but lots of issues (same as S. CPUE)

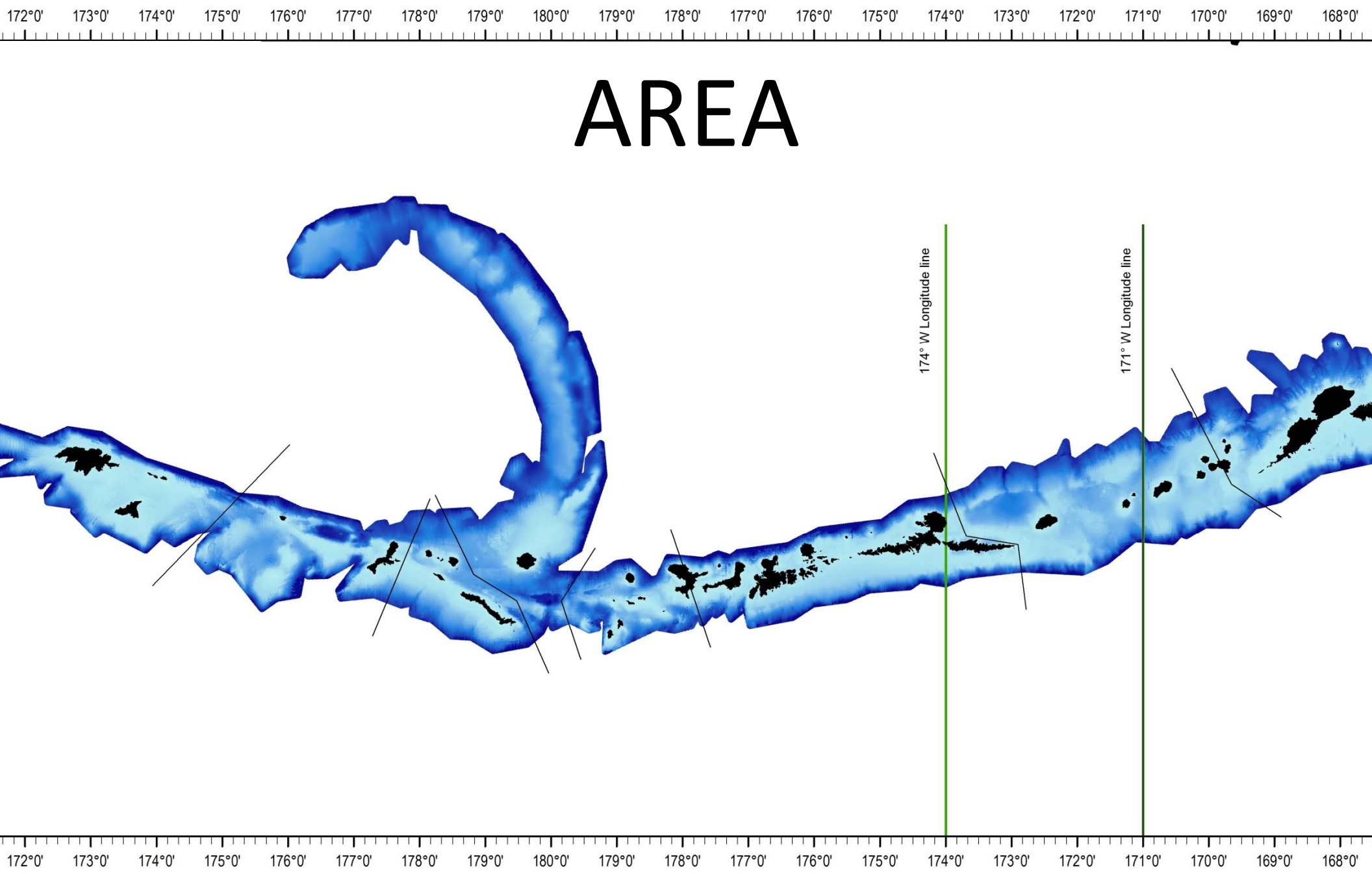
Effort: Typically not good to use (part) of response variable; proxy for habitat? But fished area reduced.


Green boxes = area with >2
(>1/year)

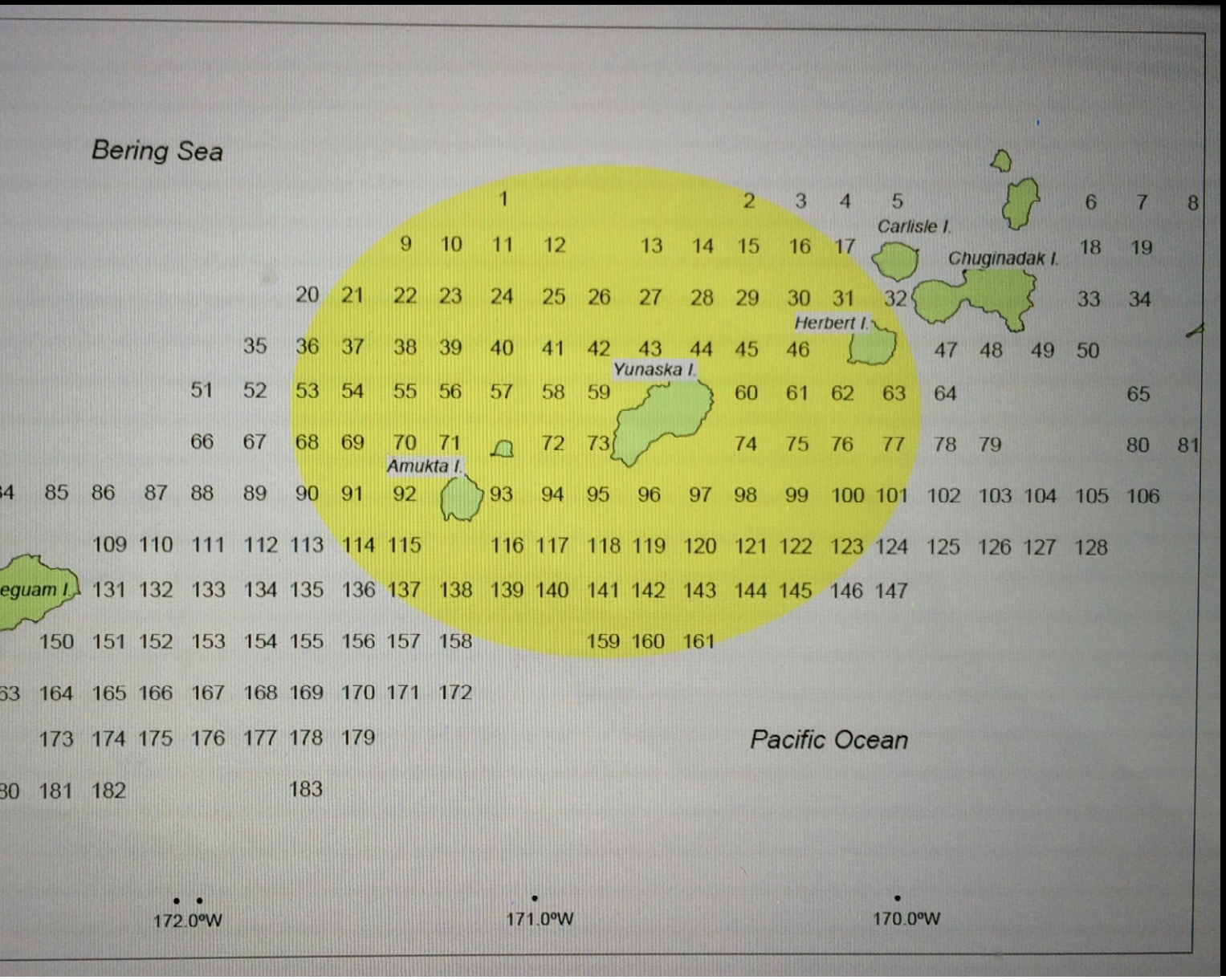

Green boxes = area with >2
(>1/year)
Open boxes = <=20 potlifts

What’s the problem?

AREA


172°0' 173°0' 174°0' 175°0' 176°0' 177°0' 178°0' 179°0' 180°0' 179°0' 178°0' 177°0' 176°0' 175°0' 174°0' 173°0' 172°0' 171°0' 170°0' 169°0' 168°0'
174° W Longitude line
171° W Longitude line
172°0' 173°0' 174°0' 175°0' 176°0' 177°0' 178°0' 179°0' 180°0' 179°0' 178°0' 177°0' 176°0' 175°0' 174°0' 173°0' 172°0' 171°0' 170°0' 169°0' 168°0'

ADF&G Triennial Survey



5nm apart
10pot strings
100fathoms apar
String ~ 0.9nm
Quantifying “all”
n = 85 (850)
Sampling area 85

Relative Index of
Tagging (growth/

Fished Area

Blue = 1000m contour
All observer data

Fished Area

2008/09

Inventory

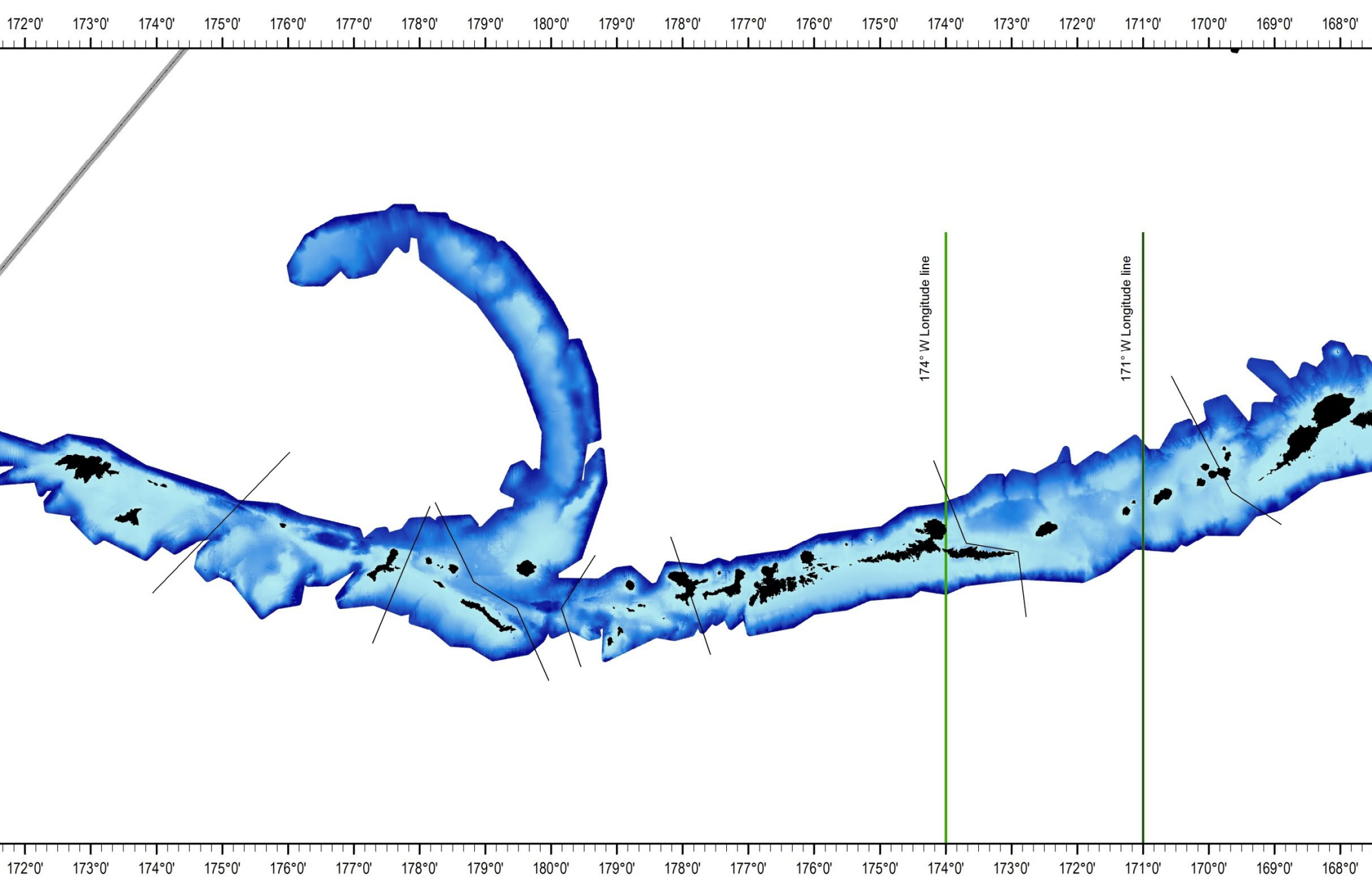
Industry:
Vessels/crew/gear/on the water/willingness
(recognize asking them to modify behavior)

ADFG/NOAA/NRC:
Personnel/Sampling design/some gear

How do we utilize all resources most efficiently?

Version 1 (last year)

Commercial gear
First trip during Commercial season
2 stage design (pots within strings / strings)


172°0'
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174° W Longitude line
171° W Longitude line