BSAI Shark Assessments

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Photo: IPHC

BSAI Sharks

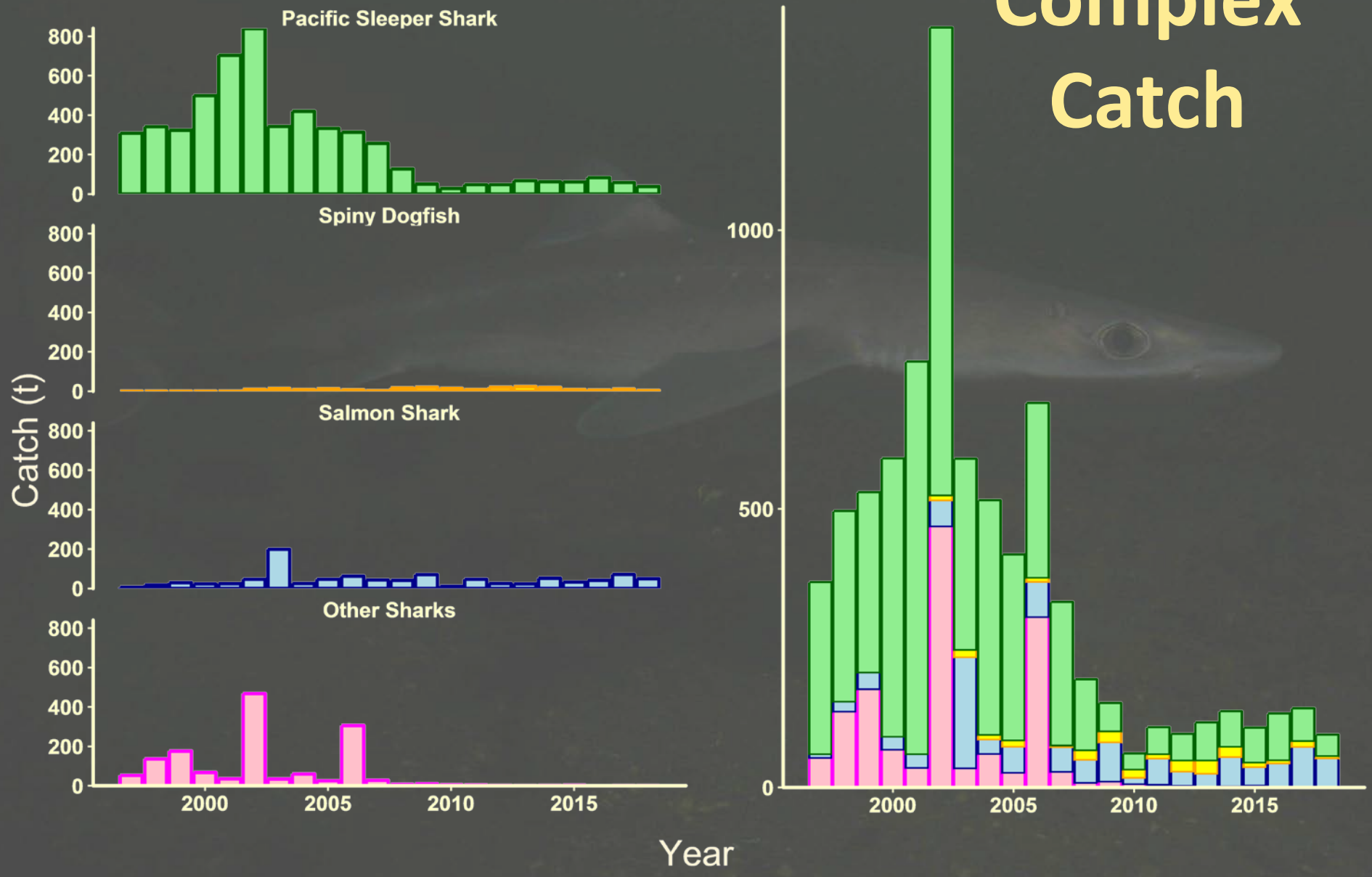
Photo: Doug Perrine, dougperrine.photosshelter.com

- New for 2018:
  - Updated catch data for 2017 and 2018 (as of Oct 9, 2018)
  - Survey data updated
    - Biomass estimates from 2017-2018 AI and EBS shelf surveys
    - RPNs for IPHC longline survey
    - Length data
- No changes to assessment methodology

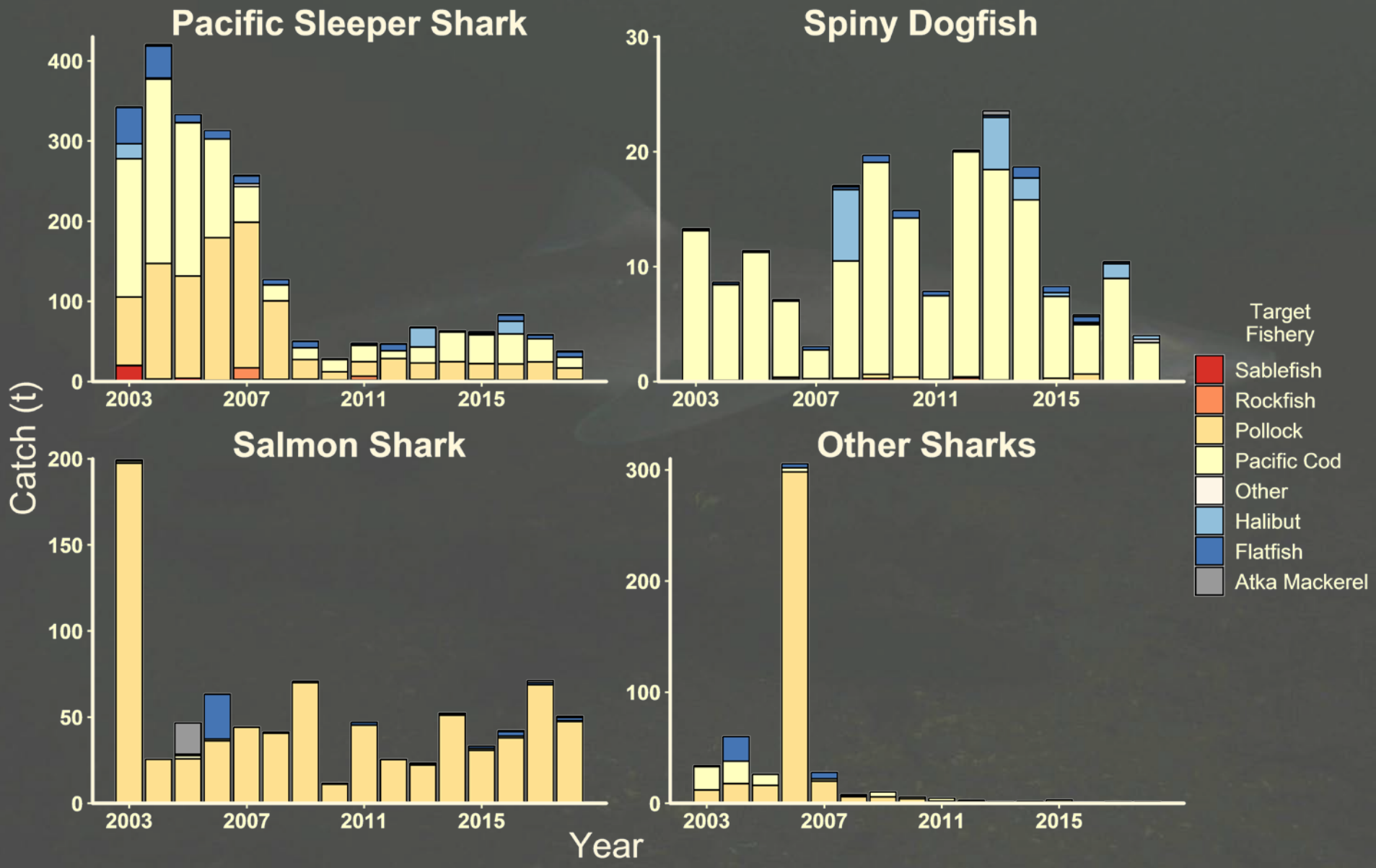
Responses to PT/SSC Comments

- Major comments (paraphrased):
  - **Develop catch by numbers and examine potential bias in observed longline caught Pacific sleeper sharks (PSS)**
    - *Both are underway, preliminary results of an observer program special project are in Appendix 20.A*
  - **Bring forward options as discussed during [Nov] PT meeting**
    - *Included in Alternative Models*
  - **Examine ageing and data-limited assessment methods**
    - *In progress*

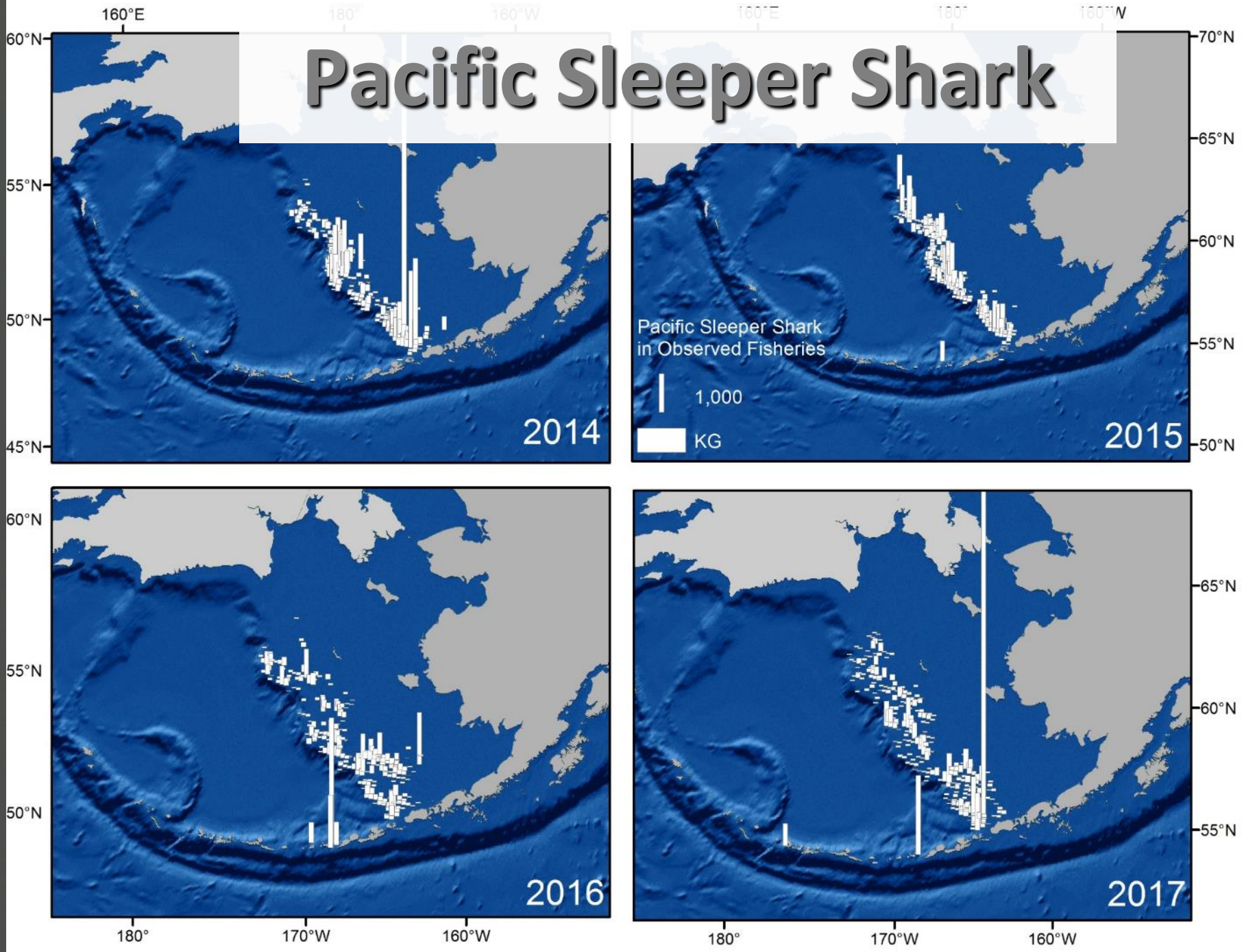
BSAI Shark Complex Catch



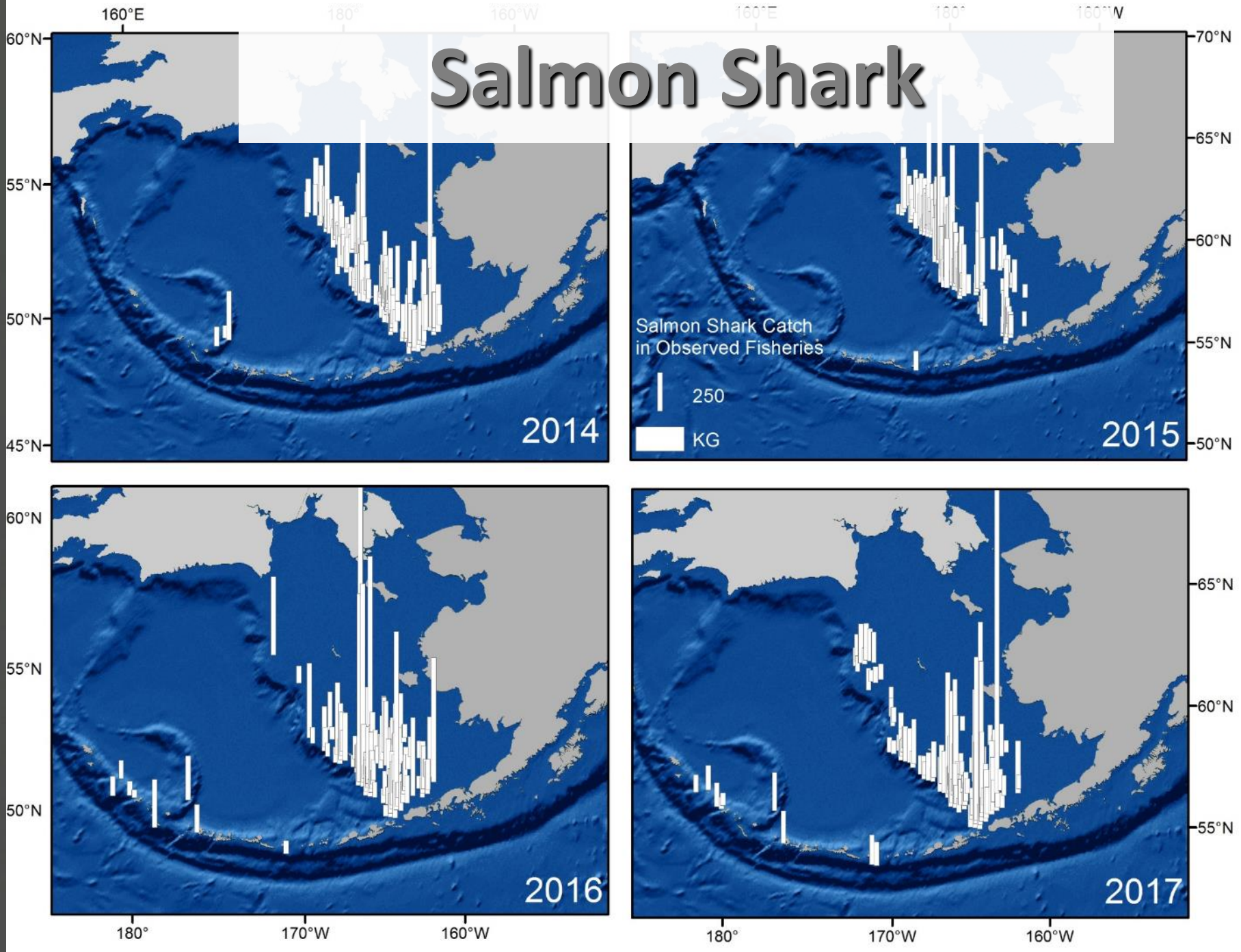
Catch by Target Group



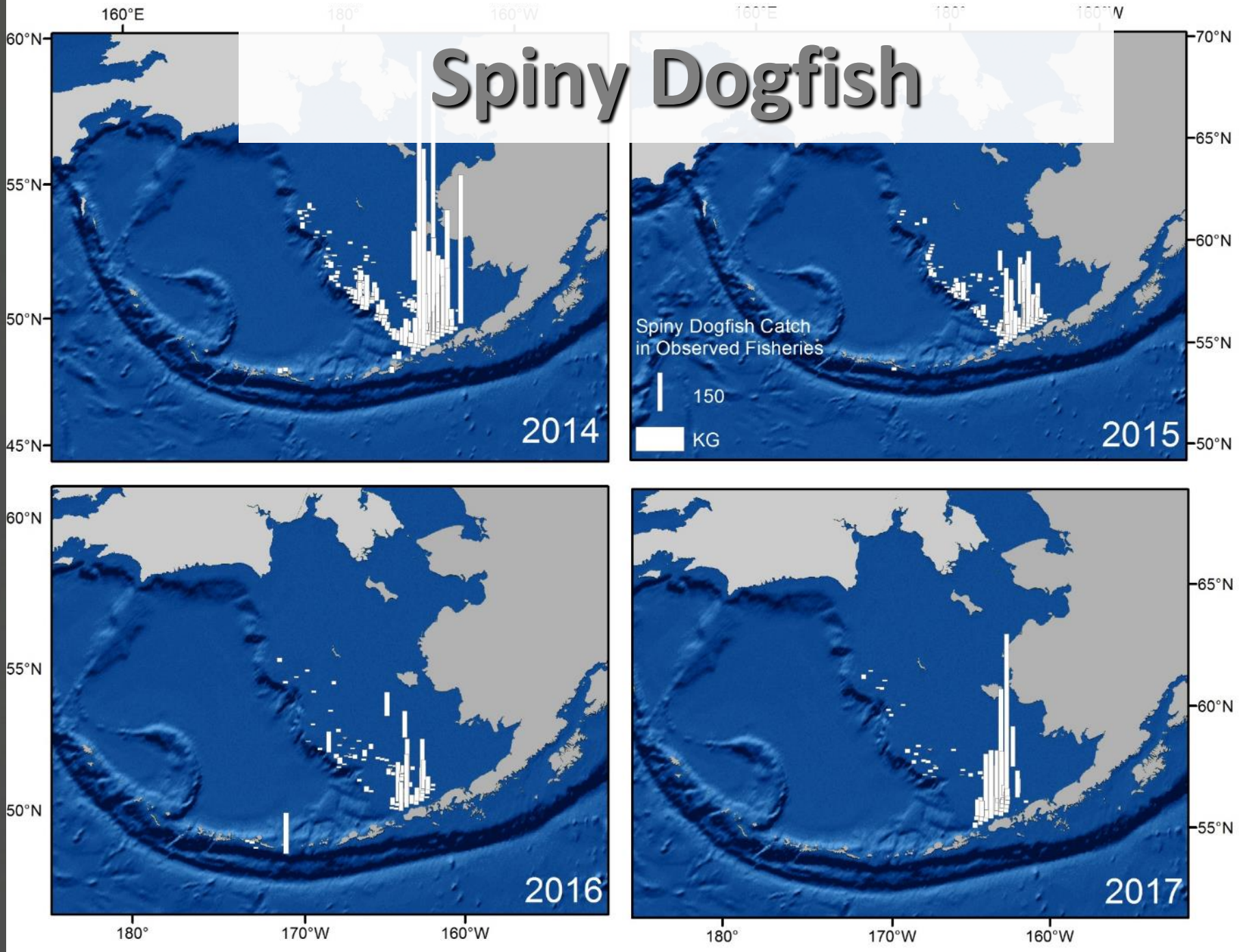
Pacific Sleeper Shark



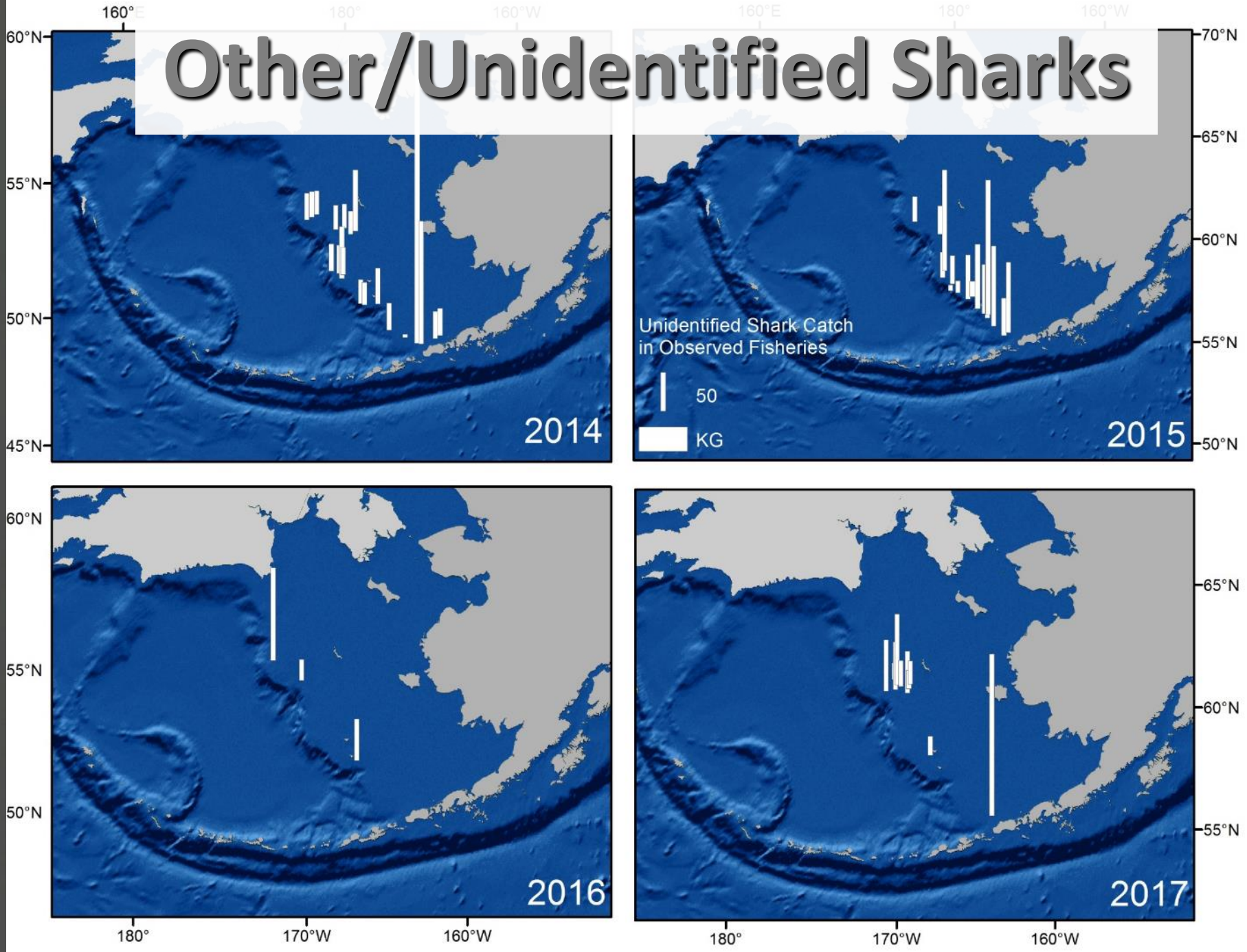
Salmon Shark



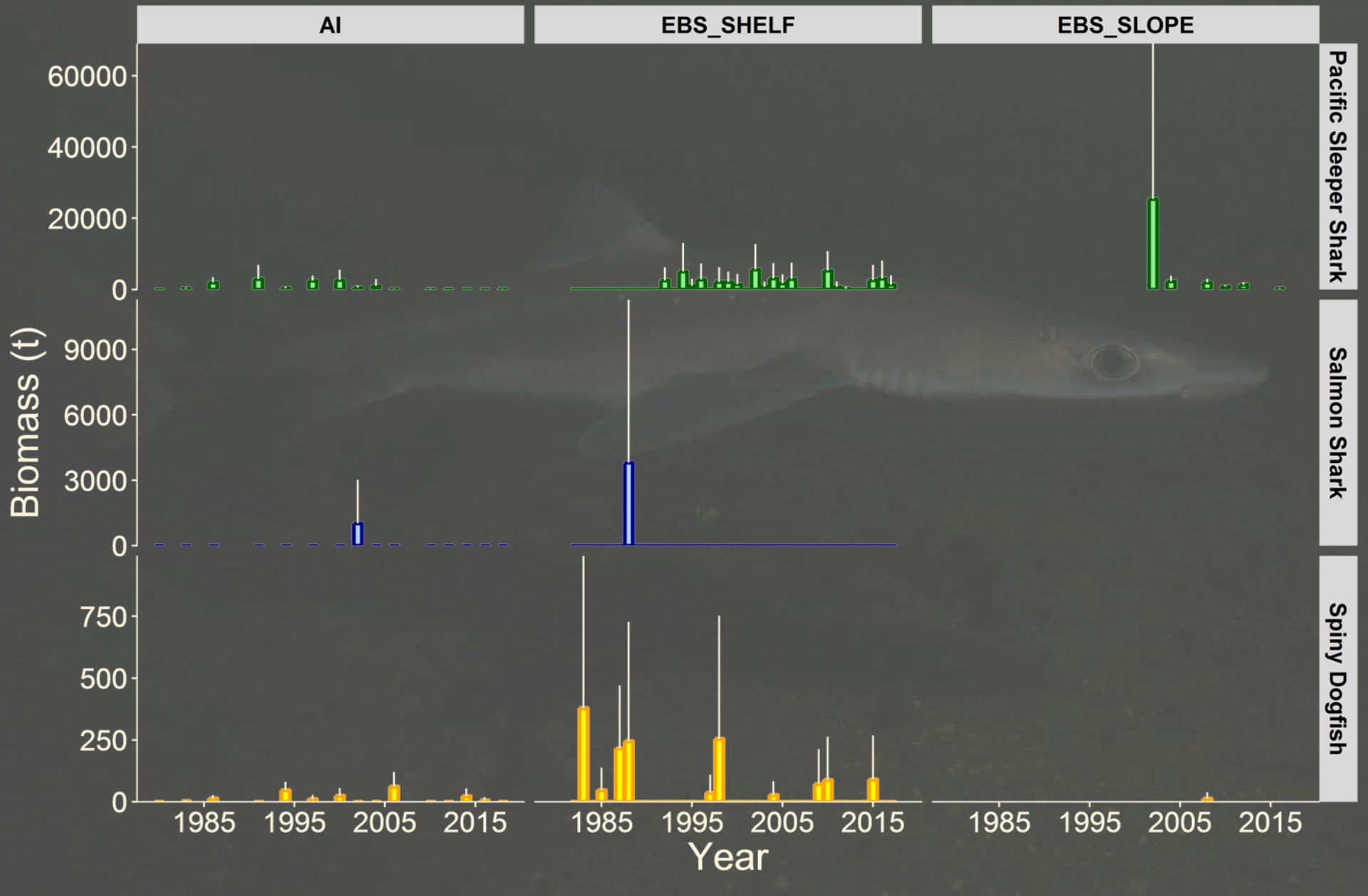
Spiny Dogfish

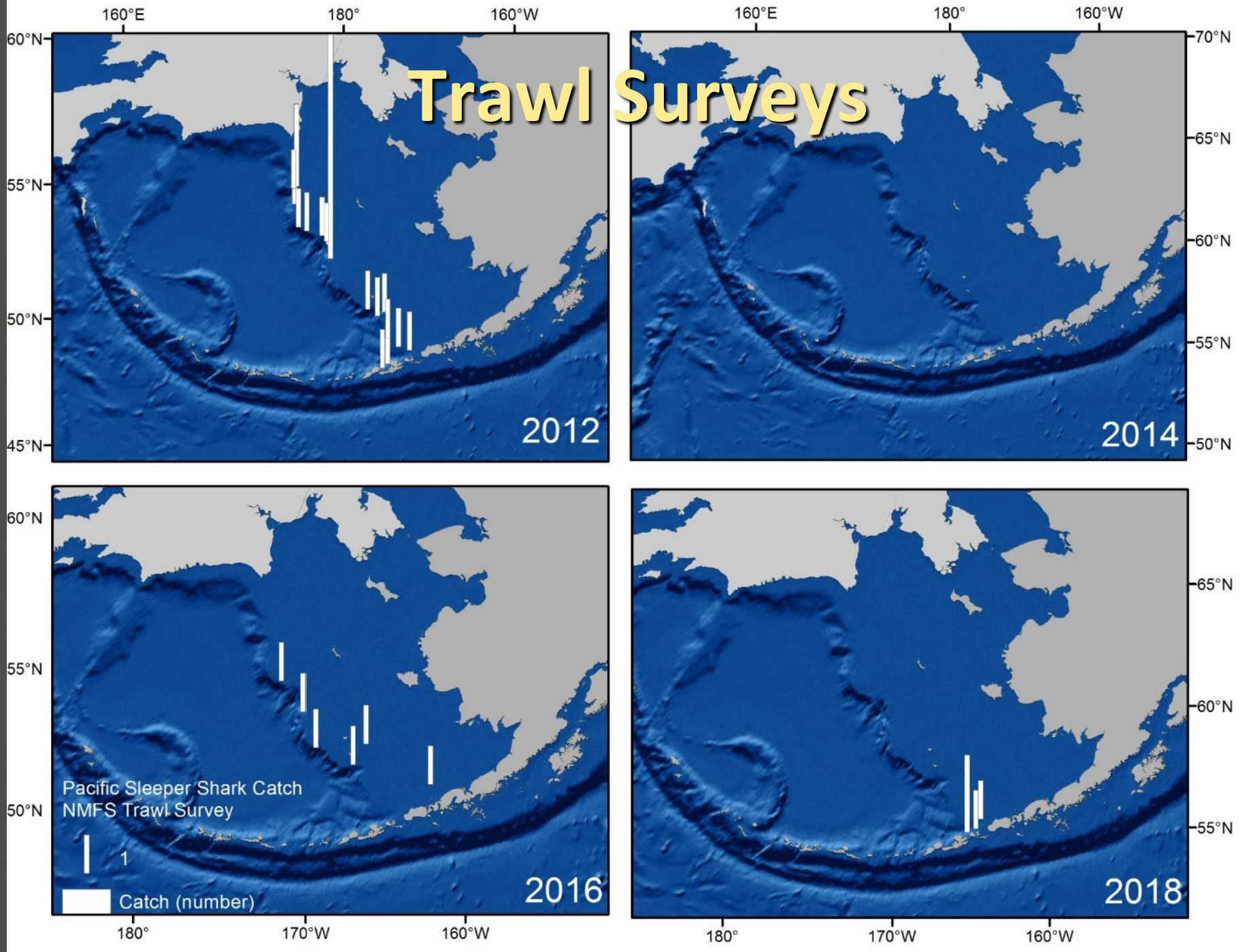


Other/Unidentified Sharks

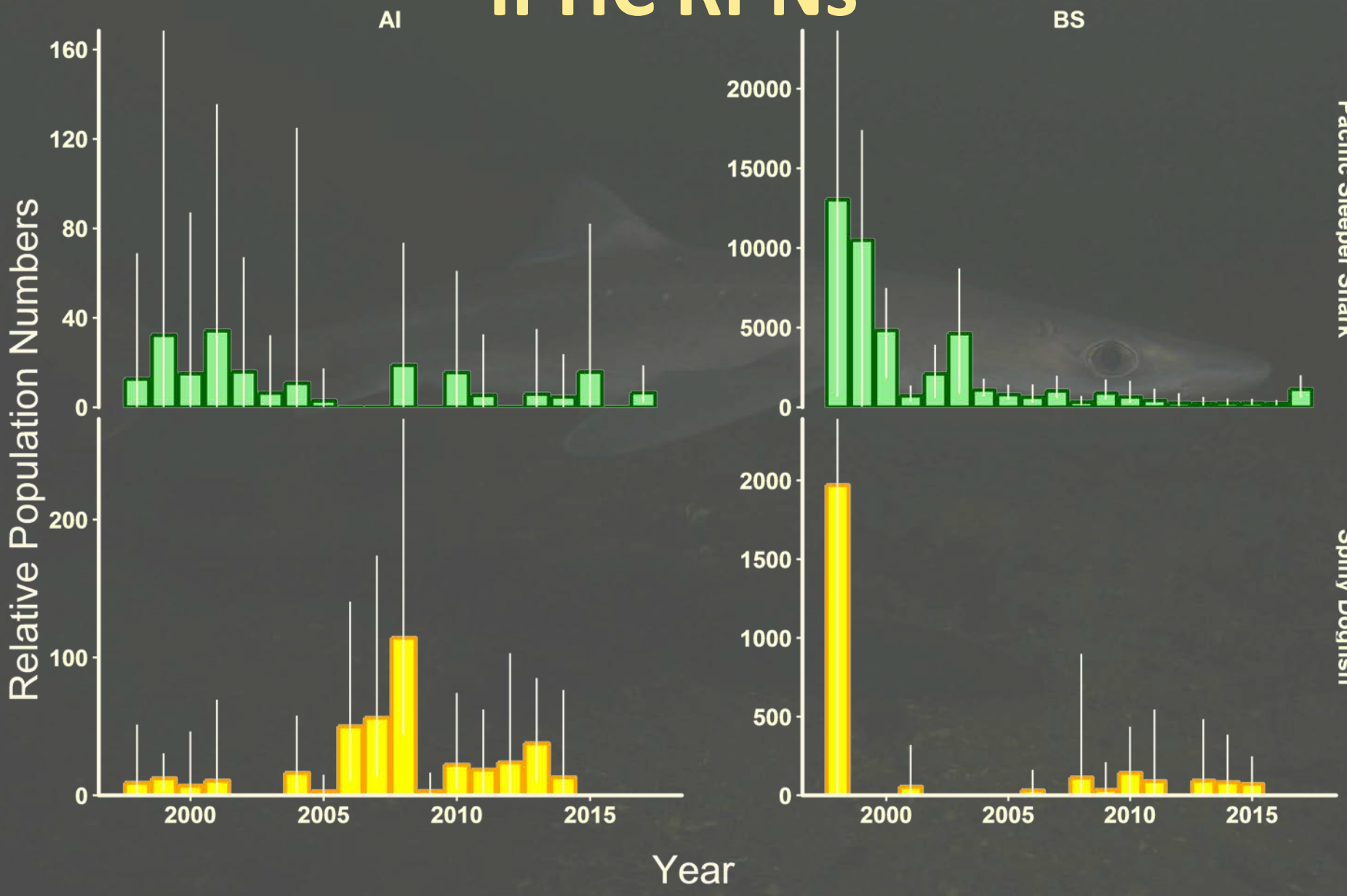


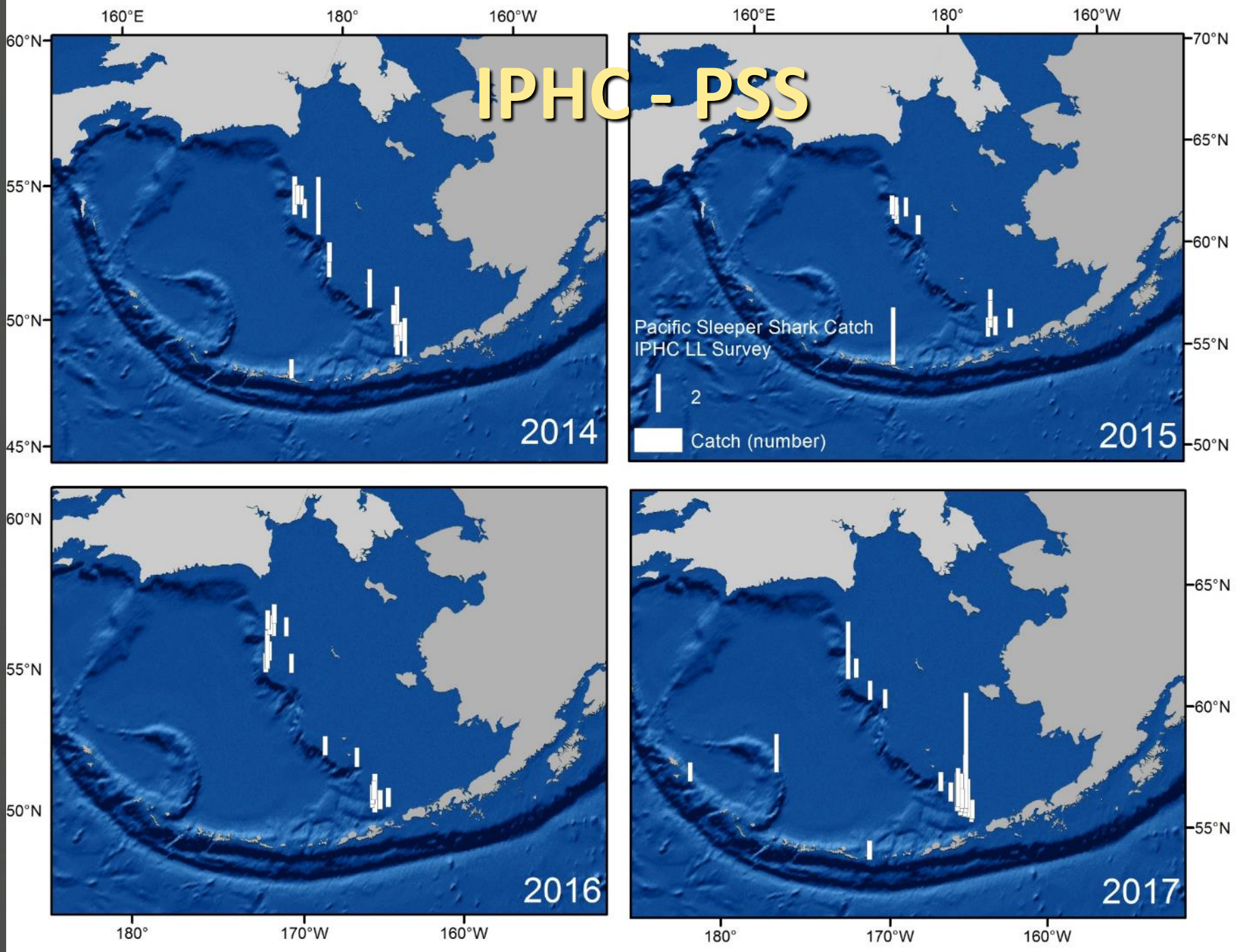
Trawl Surveys

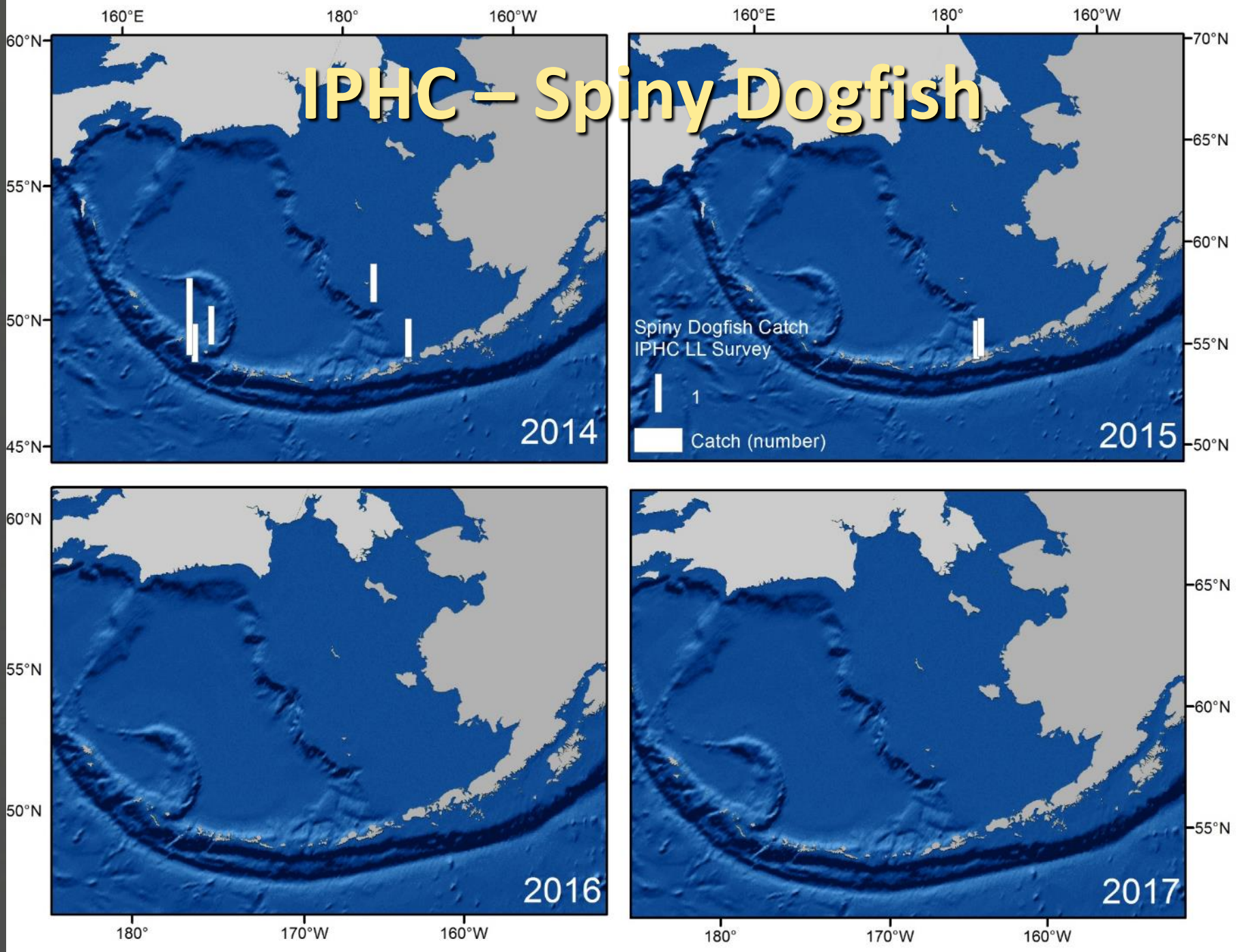



Trawl Surveys
160°E
180°
160°W
60°N
55°N
50°N
45°N
2012
70°N
65°N
60°N
55°N
50°N
2014
Pacific Sleeper Shark Catch
NMFS Trawl Survey
1
Catch (number)
2016
170°W
2018

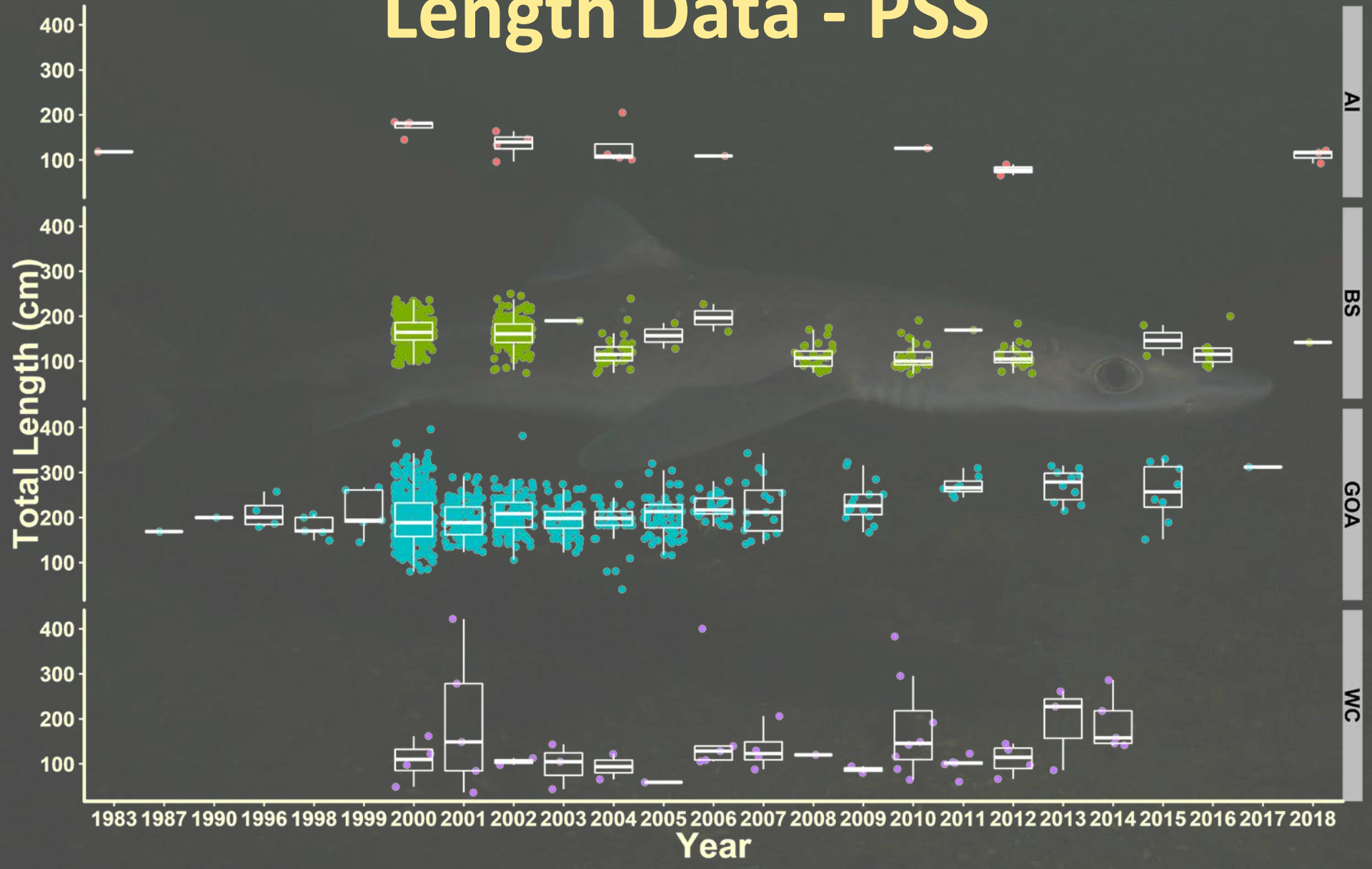
IPHC RPNs


AI
BS
Pacific Sleeper Shark
Spiny Dogfish
Relative Population Numbers
Year
0
40
80
120
160
5000
10000
15000
20000
100
200
500
1000
1500
2000
2000
2005
2010
2015


IPHC - PSS
160°E
180°
160°W
60°N
55°N
50°N
45°N
2014
70°N
65°N
60°N
55°N
50°N
Pacific Sleeper Shark Catch
IPHC LL Survey
2
Catch (number)
2015
2016
2017
170°W


IPHC – Spiny Dogfish
160°E
180°
160°W
60°N
55°N
50°N
45°N
2014
70°N
65°N
60°N
55°N
50°N
Spiny Dogfish Catch
IPHC LL Survey
1
Catch (number)
2015
2016
2017
180°
170°W
160°W

Length Data - PSS



Assessment Methods

Tier 6 Models	OFL	Equation
16.0	Max complex catch 2003–2015	$OFL = max(C_{2003-2015})$
18.0	Mean catch 2003–2015	$OFL = \bar{C}_{2003-2015}$
18.1	99% upper confidence interval of the mean catch 2003–2015	$OFL = \bar{C}_{2003-2015} + t_{0.01,12} * stdev(\bar{C}_{2003-2015})$
18.2	95% upper confidence interval of the mean catch 2003–2015	$OFL = \bar{C}_{2003-2015} + t_{0.05,12} * stdev(\bar{C}_{2003-2015})$

Model 18.x are results of SSC request to see the "options discussed in the Plan Team (using the 2003-2015 time period)"

ABC and OFL Recommendations

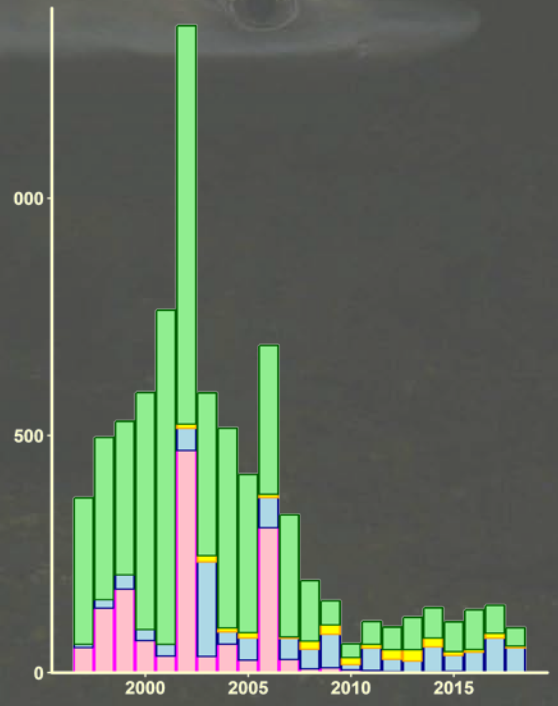
- ABC/OFL set for complex as a whole, not the sum of individual species
- All species are currently Tier 6 (Model 16.0)

ABC and OFL Recommendations

Species	Spiny dogfish	Pacific sleeper shark	Salmon shark	Other/Unidentified shark	Total shark Complex
Maximum Catch	24	421	199	305	689*
Model 16.0 OFL	**24**	**421**	**199**	**305**	**689**
Model 16.0 ABC	**18**	**315**	**149**	**229**	**517**
Average Catch	14	166	53	38	270
Model 18.0 OFL	14	166	53	38	270
Model 18.0 ABC	10	125	40	28	203
99% Confidence Interval	32	604	196	289	1,122
Model 18.1 OFL	32	604	196	289	1,122
Model 18.1 ABC	24	453	147	216	842
95% Confidence Interval	27	479	155	217	878
Model 18.2 OFL	27	479	155	217	878
Model 18.2 ABC	20	359	116	163	658

Why stick with Status Quo?

- Distribution of catch data are skewed
- Violates assumption of normality, thus mean or any metric based on it is invalid
- Not worth the fuss at this time
  - Catch much lower than any of the alternatives
  - Not going to change behavior
    - Undesirable!!!!!
  - DLMs for next assessment



ABC and OFL Recommendations

Quantity	As estimated or specified last year for: 2018	2019	As estimated or recommended this year for: 2019	2020
Tier	6	6	6	6
OFL (t)	689	689	**689**	689
maxABC (t)	517	517	517	517
ABC (t)	517	517	**517**	517
Status	As determined last year for: 2016	2017	As determined this year for: 2017	2018
Overfishing	No	n/a	No	n/a

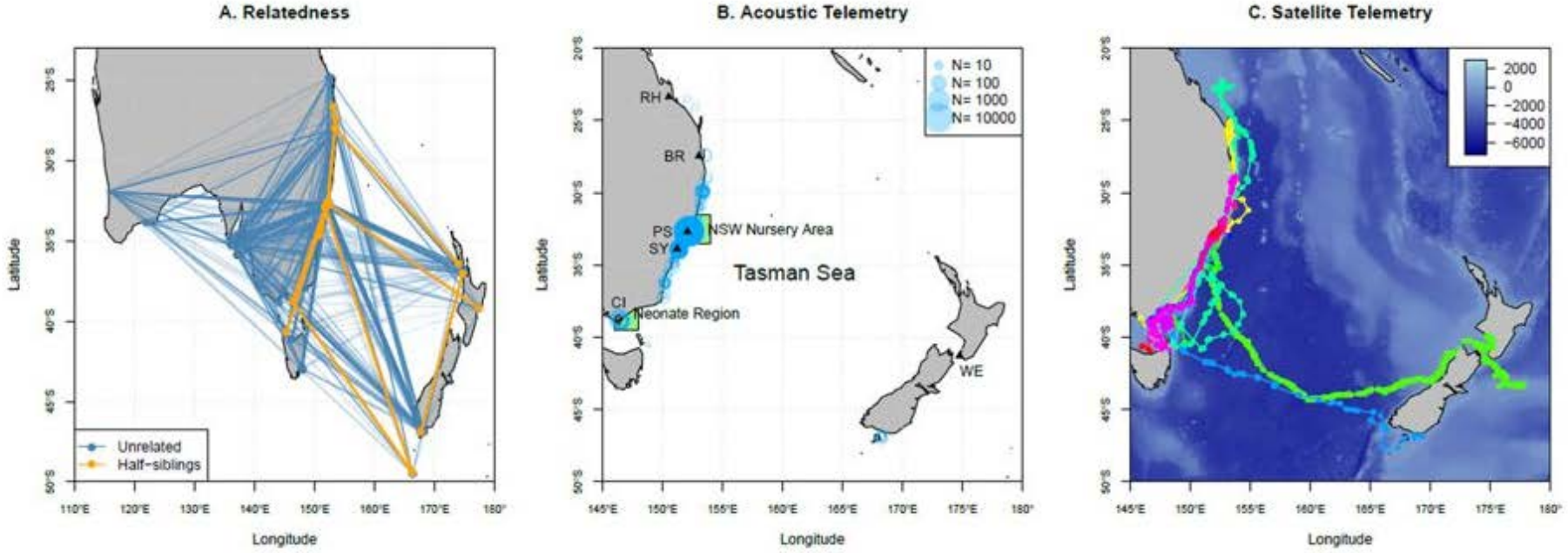
Questions so far???

Photo: RACE Survey Team

Outstanding Issues

- Genetic stock structure, close kin mark-recapture
  - Samples have been/are being run in new MiSeq
  - Planning for a PSS stock structure document Sept 2019

Hillary et al. 2018



Outstanding Issues

- Ageing
  - Pilot study underway
    - Samples prepped and ready to send, just waiting PO
  - Reaching out to find faculty with right expertise (bio-chem) to collaborate with
  - Drafting proposals for MS student

Outstanding Issues

- Discard mortality
  - Collaboration with UAF, ASLC and (hopefully) industry (I need to talk to you folks!)
  - Drafting co-op research proposal
  - MS student at UAF

https://60nscience.alaskasealife.org

Outstanding Issues

- Catch by numbers
  - Working with the AKRO staff to get numbers back to 2003
  - Should be available for next full assessment!!!
- Data-limited methods
  - Should be available for next full assessment

Outstanding Issues

- Unobserved catch in state fisheries
  - Could be a significant source of removals

Photo: UAF

Photo: Mike McFerrin, rainforesttreks.com