

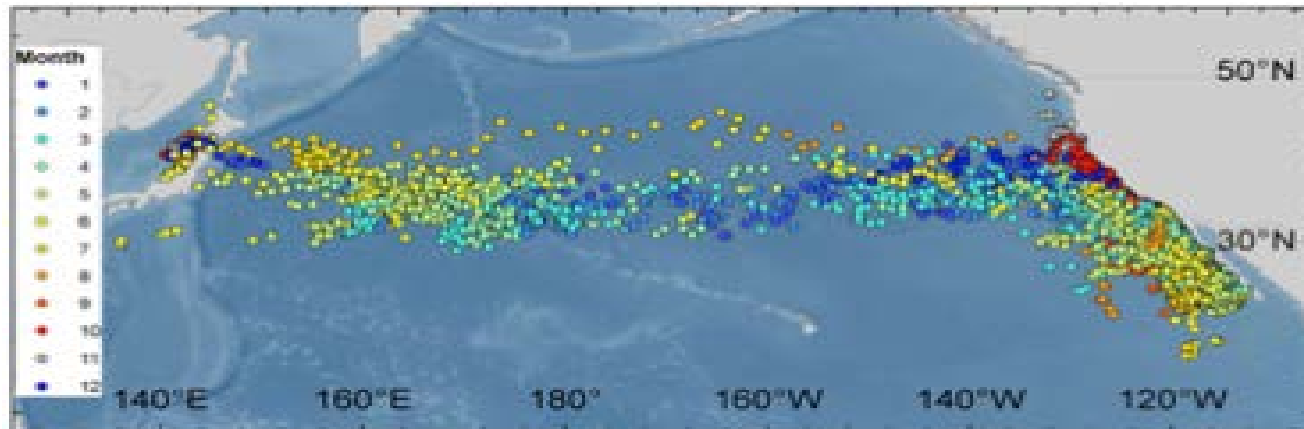


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Southwest Fisheries Science Center

NMFS Report SWFSC Activities Highly Migratory Species

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Presentation Outline

- Highly Migratory Species (HMS) Biological Research
- HMS Management Tools
- HMS Stock Assessment Schedule
- HMS Meetings/Workshops



PBF Biological Sampling

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
Number	75	78	54	189	294	171	156	120	276	421	493	2327

- 2018: Fish collected from 14 - 364 lbs
- No sign of spawning or gonadal development in larger fish

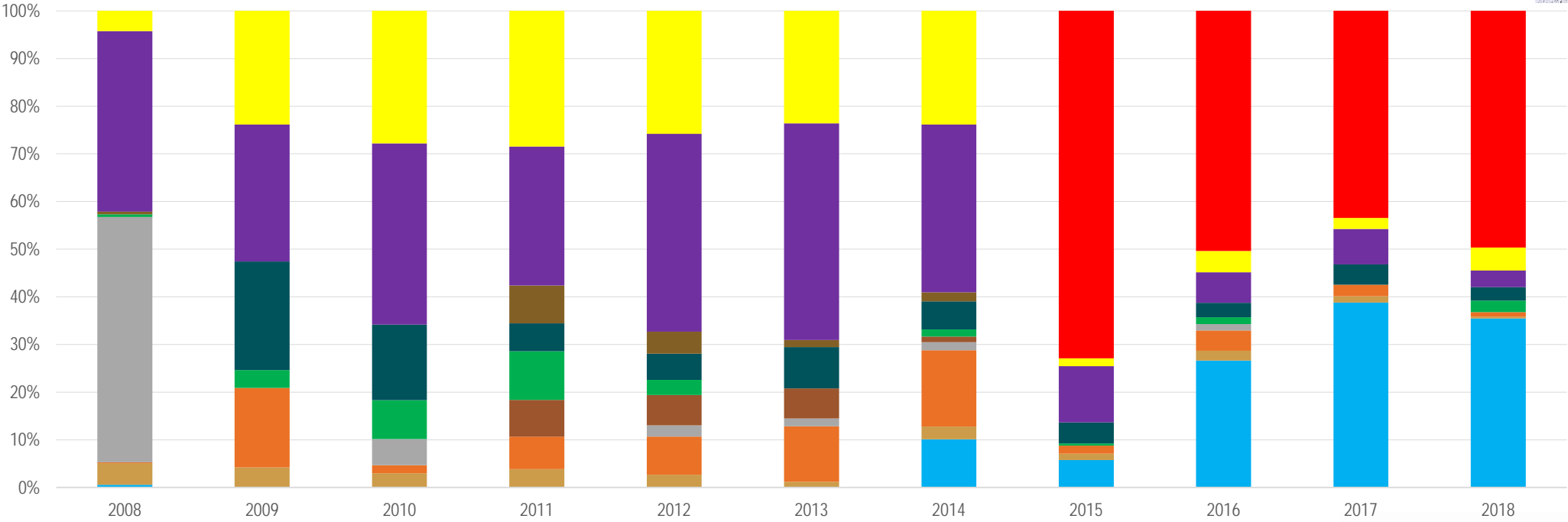




PBF Foraging Ecology (2008-2018)



Important Prey Species by Year



- Northern Anchovy
- Fish
- Jack Mackerel
- Myctophidae
- Pacific Mackerel
- Pacific Saury
- Sebastes spp
- Sardine
- Cephalopods
- Crustaceans
- Pelagic Red Crab

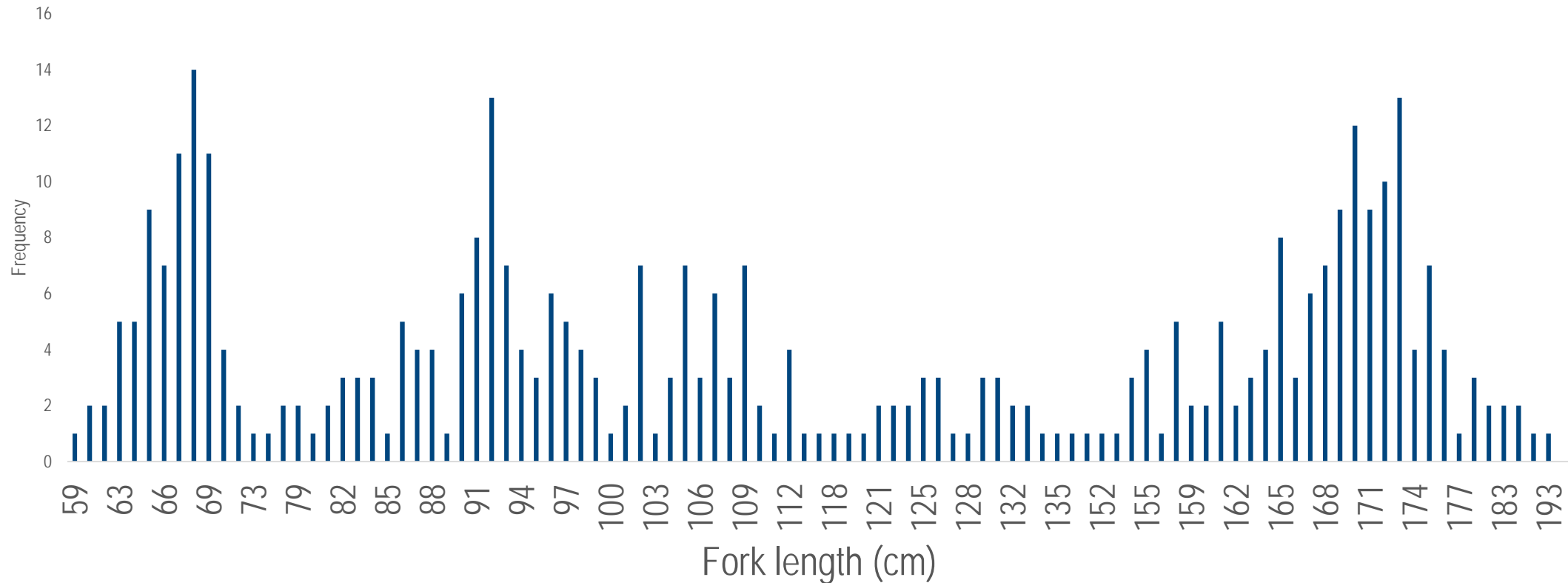


PBF Recreational Catch Size Sampling

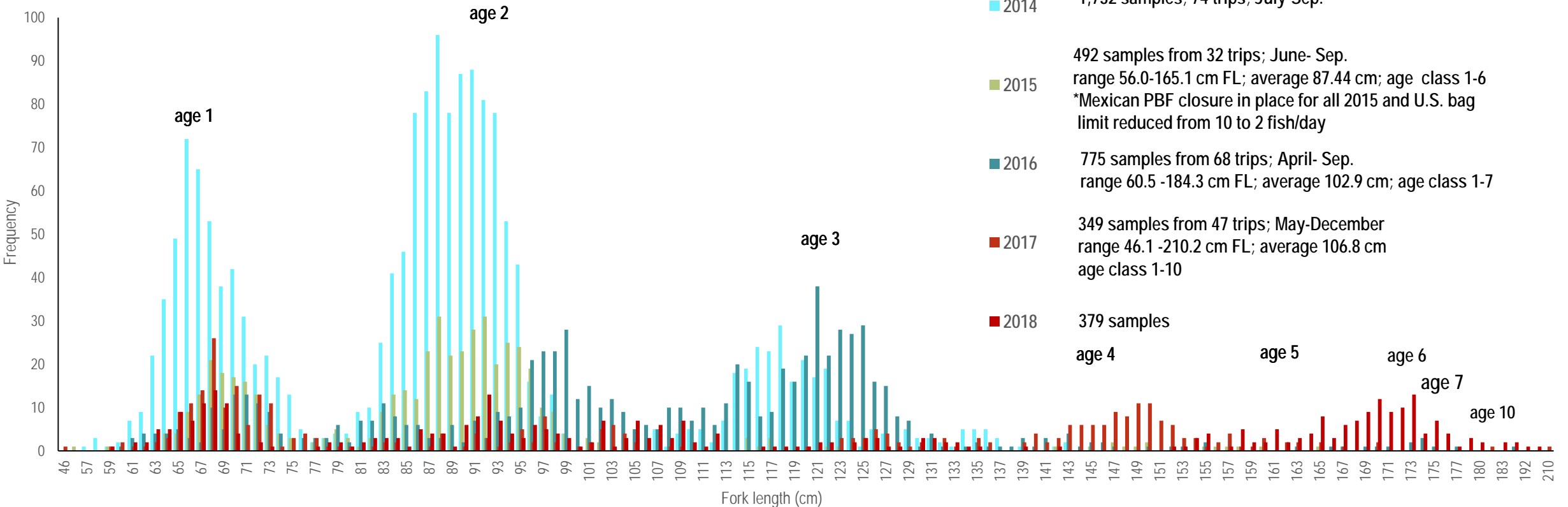
- 4024 bluefin measured from long- and short-range CPFV trips (2013-2018)
- **2018 larger fish continued to be caught (up to 364 lbs) (n= 379)**



2018



Bluefin Recreational Catch Size Sampling



PBF SWFSC-NRIFSF Joint Bluefin Tuna Research Chemical Tracers (Otoliths and Tissue)



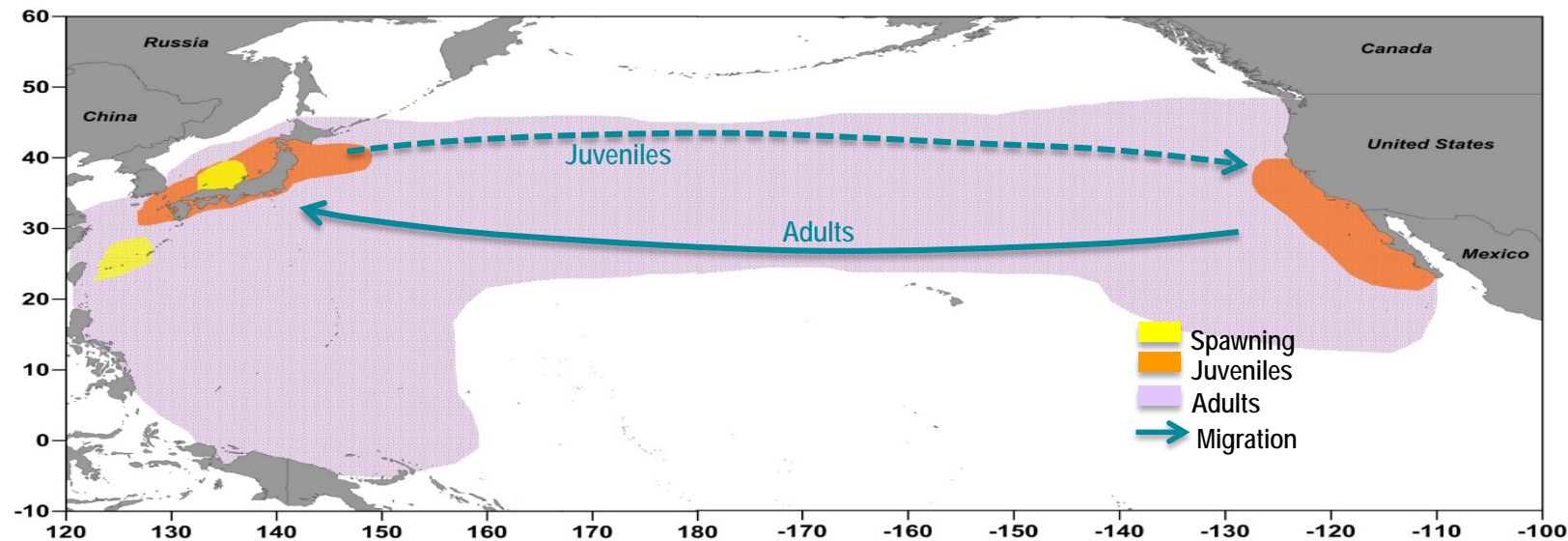
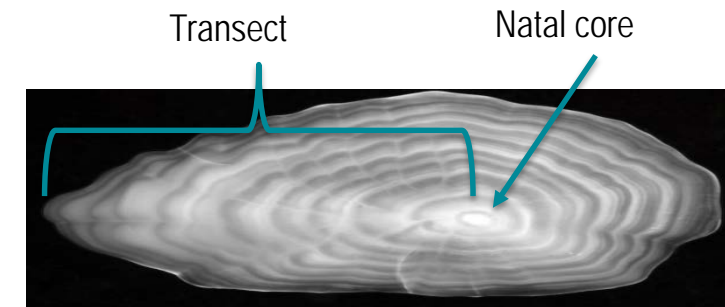
Goal: Quantify dynamics of Bluefin movements across the Pacific using otolith and tissue microchemistry

Progress to date

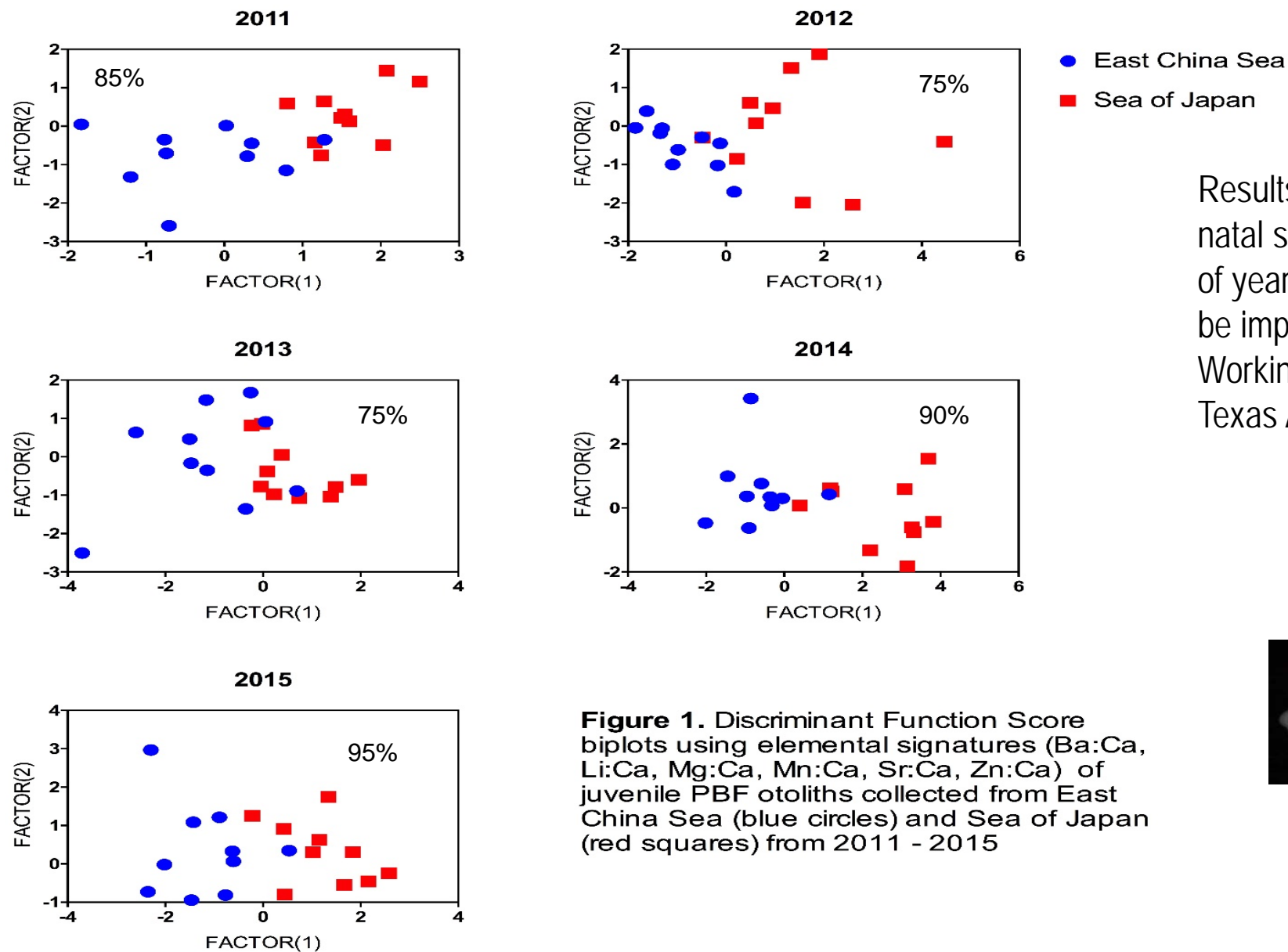
1. Established collaboration with Japan
2. Identified signature for foraging in the eastern Pacific
3. Identified distinct signature for two spawning grounds

Next Steps

1. Using transect across otolith determine relative contribution of eastern fish to spawning stock biomass
2. Determine patterns in recruitment to eastern Pacific



PBF SWFSC-NRIFS Joint Research Chemical Tracers (Otoliths and Tissue)



Results demonstrate the ability to determine natal spawning ground and the importance of year class matching. Assignment should be improved with higher sample sizes. Working being done in collaboration with Texas A&M.

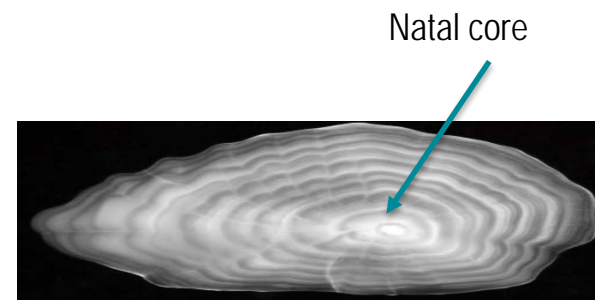
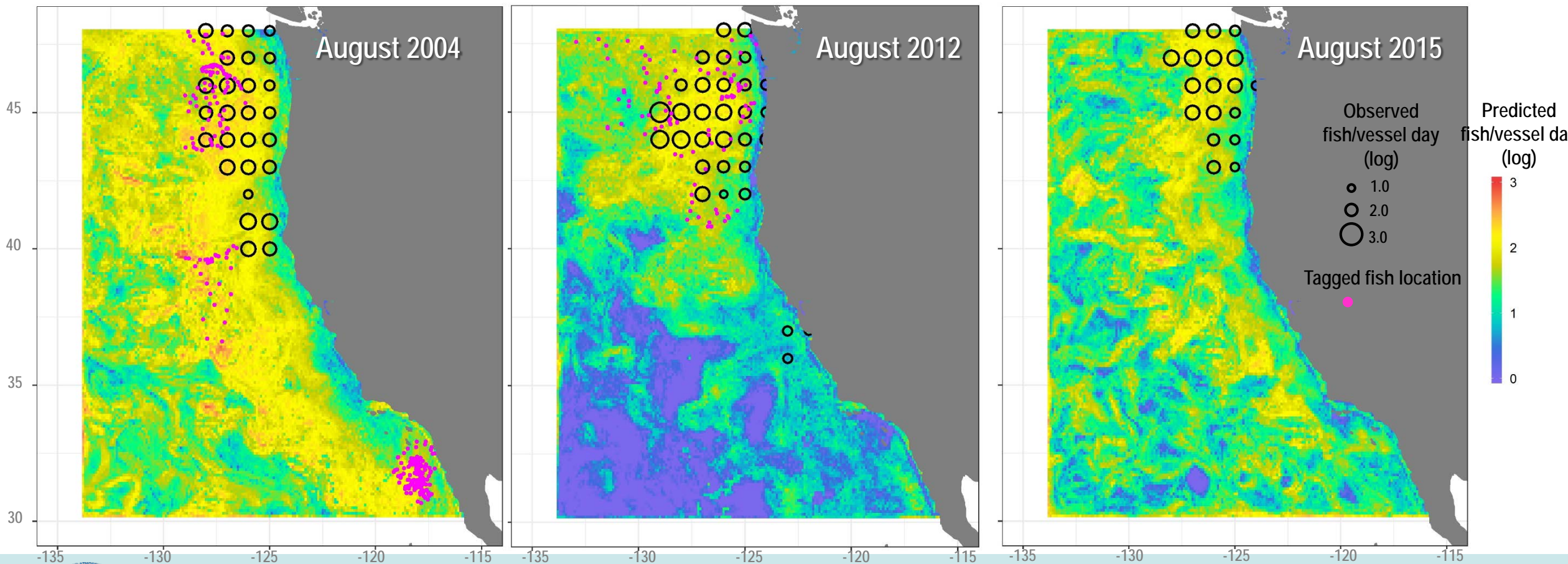


Figure 1. Discriminant Function Score biplots using elemental signatures (Ba:Ca, Li:Ca, Mg:Ca, Mn:Ca, Sr:Ca, Zn:Ca) of juvenile PBF otoliths collected from East China Sea (blue circles) and Sea of Japan (red squares) from 2011 - 2015

Albacore Distribution Modeling

- Boosted regression trees built using surface fishery logbook data, and environmental data from ROMS/satellites
- Example results from August show interannual variability in southward habitat extent for albacore
- Distribution models also built for major prey species (anchovy, sardine, hake, boreal clubhook squid)



Opah: Biological Sample Program with COP

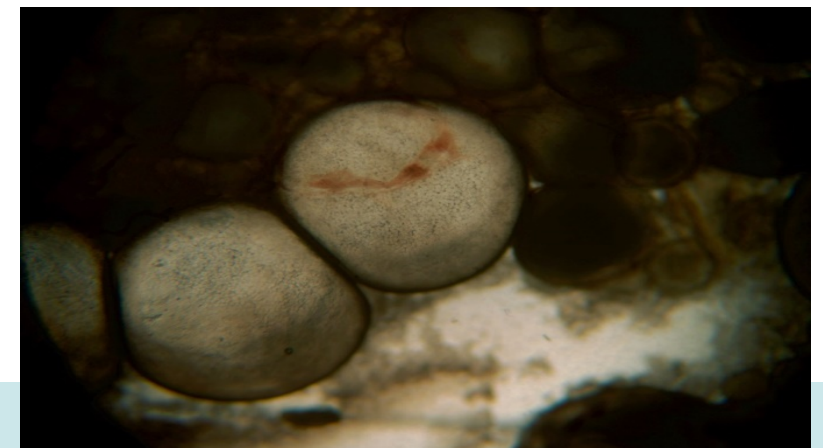
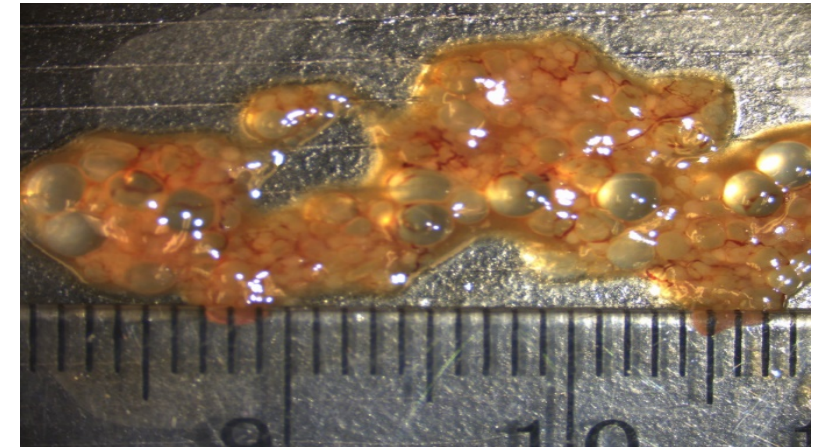
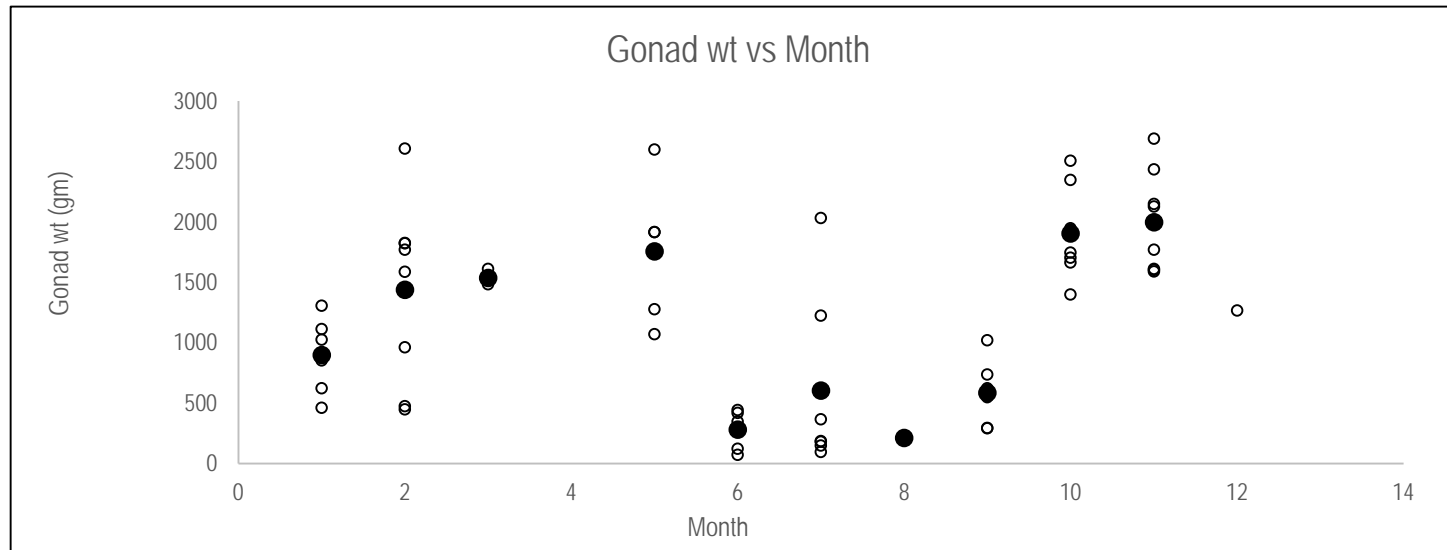
Goal: Characterize life history parameters

Progress to date:

- 1) Collected 167 biological samples/ 791 genetic samples
- 2) Identified actively spawning individuals

Next Steps:

- 1) Better characterize reproductive biology
- 2) Develop methods for age and growth
- 3) Determine species distribution
- 4) Characterize foraging ecology



HMS Management Tools

North Pacific Albacore Tuna

- MSE Webinar (preparatory discussion) – Feb. 13, 2019 (*Agenda Item J.2, Suppl. Att. 4*)
- MSE Workshop – March 5-7, 2019 (*Final Report Forthcoming*)
 - ***NO MAJOR MANAGEMENT DECISIONS (MSE MESSAGE STILL CONFUSING)***
 - refinement of management objectives and levels of risk
 - discussed pros & cons of managing based on catch or effort (TAC or TAE)
 - exploring different harvest strategies (or HCR)

Next Round of MSE Testing Completed in 2020



HMS Management Tools

Pacific Bluefin Tuna

- WCPFC-NC 2017 – ISC Requested to Conduct MSE Starting in 2019
 - 1st MSE Workshop – May 2018 Yokohama JPN
 - 2nd MSE Workshop – May 20-21, 2019 (Tom Ham's Lighthouse, San Diego, CA)
 - U.S. PBF Stakeholders Meeting (WCRO/SWFSC) – May 2, 2019 (SWFSC & Long Beach Fed. Building)
- WCPFC-NC 2019 – Final Decision



HMS Stock Assessment Schedule

2019

- North Pacific Striped Marlin (B)



2020

- North Pacific Albacore Tuna (B)
- Pacific Bluefin Tuna (B)
- Pacific Blue Marlin (U)



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HMS Meeting/Workshop Schedule

2019

- ISC PBF Close-Kin Workshop – March 16-17, 2019 Jeju, Korea
- ISC PBFWG Workshop – March 18-22, 2019 Jeju, Korea
- U.S. PBF Stakeholders Meeting – May 2, 2019 (SWFSC & Long Beach Fed. Building)
- ISC19 July 9-15, 2019 Taipei, Taiwan

- HMS Fishery Dependent Monitoring Workshop – SWFSC TBD
- HMS Research Coordination Workshop (NP Albacore & PBF tuna focus) – SWFSC TBD

2020

- ISC20 – U.S.

Thank You

Questions?



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