Science, Service, Stewardship

Agenda Item F.1.b
Supplemental NWFSC PowerPoint
June 2017

Groundfish Science Report

Kevin Werner, Mark Strom, Michelle McClure

Northwest Fisheries Science Center

June 9, 2017

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NWFSC NORTHWEST FISHERIES SCIENCE CENTER

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New Director!

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Overview

- Survey updates
- Stock Assessment Review
- Observer Program News
  - Data Collection and Processing – Chinook salmon
  - Seabird Workshop
- Personnel Changes
- Science updates

2017 Groundfish Bottom Trawl Survey

Mobilization in Newport, OR May 15–19

Sunrise at-sea, day 3, off N WA

- 20th year in time series
- May 15 – Oct 24, 2017
- Vessels: F/V Excalibur, F/V Last Straw (May – Jul), F/V Noah's Ark, F/V Ms. Julie (Aug – Oct)

- 16 volunteers
- 188 sea-days
- 752 stations
- Collaboration with states, PSMFC, AFSC, Moss Landing Research Laboratory, universities, industry

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Summer Hake Survey

- Mobilizing next week
- Embark on June 16, 2017
- Canadian charter vessel will be used –
  - Complete survey with 10 nm spacing will be conducted
- Blog: The Main Deck
  - https://www.nwfsc.noaa.gov/news/blogs/display_blogentry.cfm?blogid=7

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Stock Assessment Reviews

Stock Assessment Review Schedule

Stock Assessment Review Meetings	Dates / Location	Species	Stock Assessment Teams
SSC Review of Update Assessments	June 6-14	arrowtooth flounder	David Sampson, Owen Hamel and graduate students
		blackgill rockfish	John Field & Xi He
	Spokane, WA	bocaccio rockfish	Xi He
		darkblotched rockfish	John Wallace & Vlada Gertseva
STAR Panel 1	June 26-30	lingcod	Melissa Haltuch & John Wallace, et al.
	NWFSC, Auditorium, Seattle, WA	Pacific ocean perch	Chantel Wetzel & Lee Cronin-Fine
STAR Panel 2	July 10-14	yelloweye rockfish	Vlada Gertseva & Jason Cope
	NWFSC, Auditorium, Seattle, WA	yellowtail rockfish	Andi Stephens & Ian Taylor
STAR Panel 3	July 24-28	blue/deacon rockfish	E.J. Dick & Aaron Berger, et al.
	SWFC, Large Conf. Room, Santa Cruz, CA	California scorpionfish	Melissa Monk

Note: Assessment documents will be available for reviewers and the public two weeks before the start of each STAR Panel.

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Observer Updates:

Chinook Salmon Data Collection
Seabird Workshop

Chinook salmon data collection
NWFSC Observer Program

- **Numbers sampled**
  - Average 2008 – 2015 = approx. 2000
  - Range = 600 - 3800
- **Biological data**
  - Data taken on all salmon (in the portion/sample taken by the observer)
    - Exception: rare event with high numbers (45+) – subsampling with at least 25 individuals minimum.
- **Other species**
  - Less than 2% of salmon bycatch

Chinook salmon data collection
NWFSC Observer Program

- **Catch estimates**
  - Counts and weights
- **Biological data**
  - Sex, length, weight, coded wire tag detection, adipose fin status, fin clip for genetics
- **Coded wire tags**
  - Extracted and read in-house (NWFSC)
  - Data uploaded into RMIS database for use by NMFS, Tribes, States, and Hatcheries
- **Genetics**
  - Samples are processed in-house (NWFSC)
  - Data are analyzed and used by NMFS (Biological Opinion, reports to WCR, etc.)

Seabird Cable Strike Mitigation Workshop

November 7-8, 2017
Seattle, Washington

- NOAA Fisheries will host a 2-day Seabird cable strike mitigation workshop, everyone is welcome.

- Cable strikes are a known source of seabird mortality, particularly on at-sea factory trawlers. Data from studies in both the Bering Sea pollock fishery and the West Coast at-sea hake fishery indicate that the estimated mortalities for cable strikes are much greater than the observed mortalities collected as part of typical observer duties.

- This collaborative workshop will bring together the at-sea processing industry, engineers, biologists and fisheries managers to develop innovative, practical gear-modifications for reducing seabird cable strike mortality.

- Additional information or want to attend? Please contact Vanessa Tuttle 206-860-3479 or Vanessa.Tuttle@noaa.gov).

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Personnel Changes

Population Ecology Program

Management Strategy Evaluation Coordinator – Dr. Kristin Marshall

- Hake MSE

Stock Assessor – Kelli Johnson

- Was lead author of 2015 sablefish update assessment

Economics and Social Science Research Program

Economist – Marie Guldin

- Working on 5-year review of our catch share program

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Science Updates: Recent Publications

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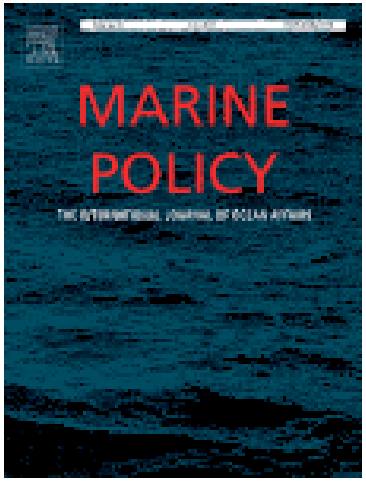

Can vessel buybacks pay off: An evaluation of an industry funded fishing vessel buyback

Dan Holland[1], Erin Steiner[2]
[1] Conservation Biology Division
[2] Fisheries Resource Analysis and Monitoring Division
Northwest Fisheries Science Center

Holland, D. S., E. Steiner, and A. Warlick. 2017. Can vessel buybacks pay off: An evaluation of an industry funded fishing vessel buyback. Marine Policy 82:8–15.

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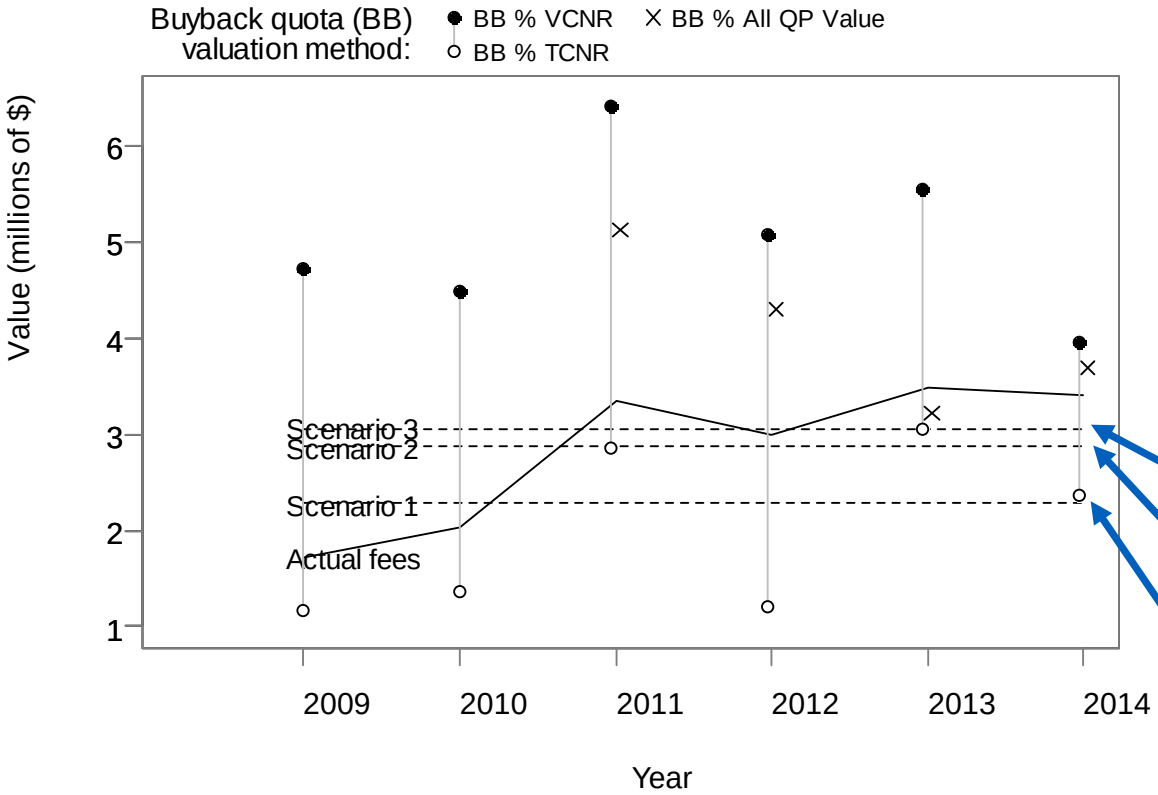

Fig. 1. Fixed annual payments necessary to pay back the cost of the buyback program under three scenarios (dashed lines), actual fees (solid line), and value of buyback quota pounds using three methods (% of variable cost net revenue, % of total cost net revenue, % of All QP value).

- Under most methods, since the implementation of the catch share program, the benefits exceed the financing costs of the program.
- Benefits of the buyback program accrue to quota share owners, but it is vessel operators who pay the buyback fees.

Total cost of program

Cost of loan, starting repayment in 2006

Cost of loan, if repayment started in 2004

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- Wide range of economic outcomes for individuals.
- Negative net revenue in at least one year
  - •7% of vessels variable cost net revenue
  - •22% of vessels had negative total cost net
- 16 instances -- total cost net revenue was positive only until buyback fees were deducted.

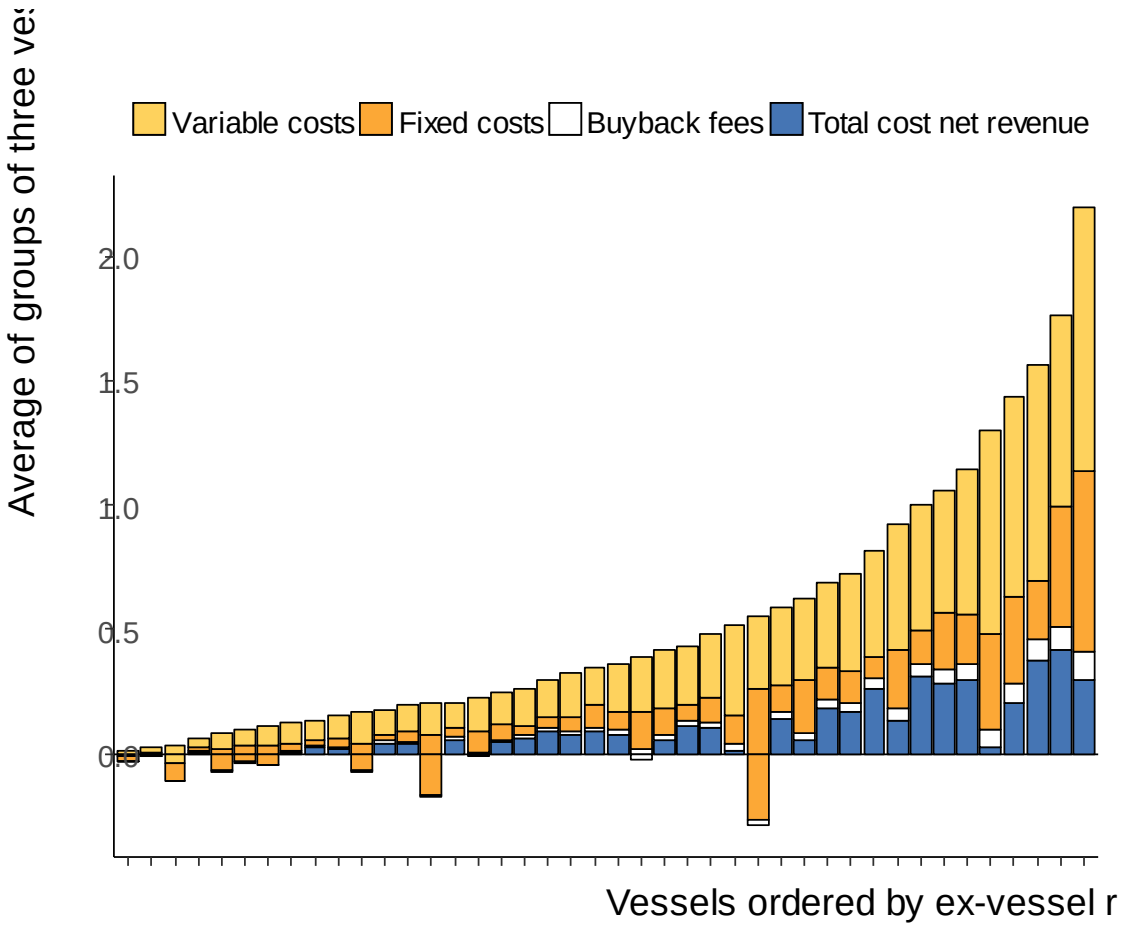

Fig. 2. Breakdown of total revenue for groupings of 3 vessels in the catch share program for 2011–2014 (number of vessels=130) showing variable costs, fixed costs, buyback fees, and total cost net revenue.

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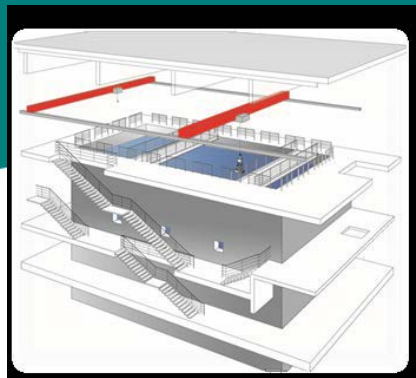

2016 USA–Norway EK80 Workshop Report: Evaluation of a wideband echosounder for fisheries and marine ecosystem science.

David A. Demer, Lars N. Andersen, Chris Bassett, Laurent Berger, Dezhang Chu, Jeff Condiotty, George R. Cutter Jr., Briony Hutton, Rolf Korneliussen, Naig Le Bouffant, Gavin Macaulay, William L. Michaels, David Murfin, Armin Pobitzer, Josiah S. Renfree, Thomas S. Sessions, Kevin L. Stierhoff, Charles H. Thompson

2017 ICES Cooperative Research Report No. 336. 69 pp.
http://doi.org/10.17895/ices.pub.2318

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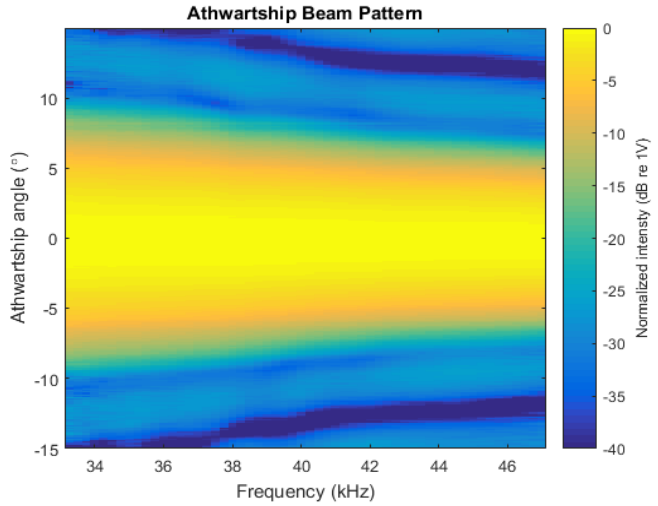
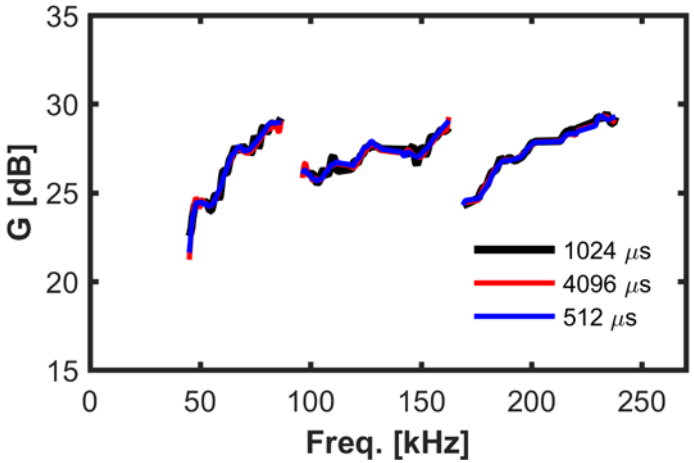
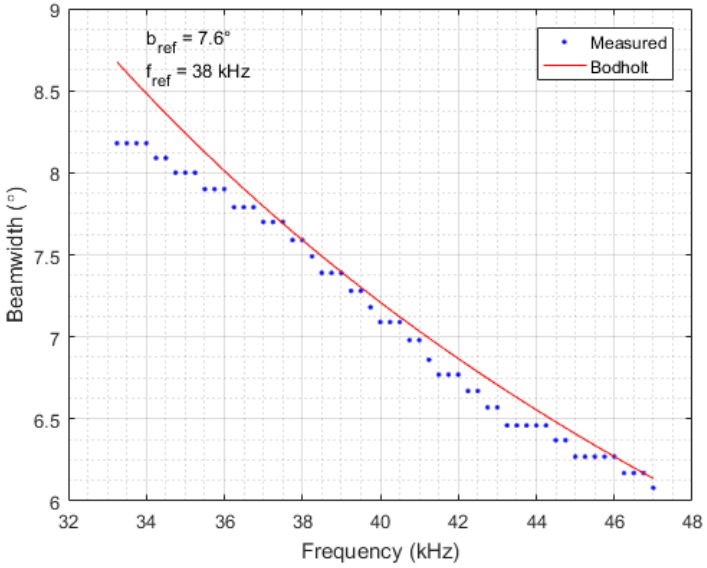
EK80 Workshop: Challenges of Wideband

Frequency dependent:

- Acoustic absorption
- Transducer efficiency
- Transducer beamwidth
- Calibration
- Scatterer reflectivity
- Scatterer directivity







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Species-specific responses of demersal fishes to near-bottom oxygen levels within the California Current large marine ecosystem

Aimee A. Keller[1], Lorenzo Ciannelli[2], W. Waldo Wakefield[1], Victor Simon[1], John A. Barth[2], Stephen D. Pierce[2]

[1]Fishery Resource Analysis and Monitoring Division, Northwest Fisheries Science Center, Seattle WA, Newport OR
[2]College of Earth, Ocean, and Atmospheric Sciences (CEOAS), OSU, Corvallis, OR

Mar. Ecol. Prog. Ser. (2017) 568: 151-173

West Coast Groundfish Trawl Survey

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Community Effects

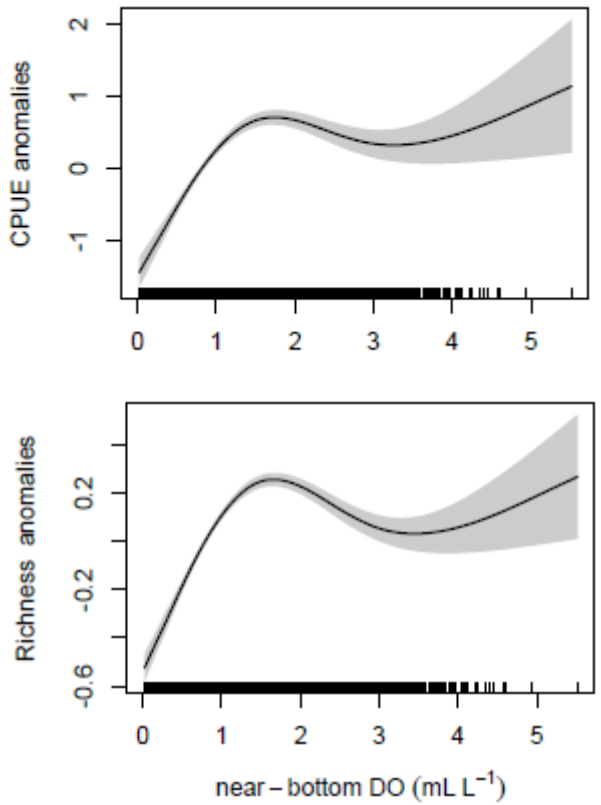

Fig. 1. Decrease in total CPUE and species richness at low DO

- 63.2% of survey sites had low near-bottom oxygen (DO) from 2008 to 2014
- Relation between catch and DO examined for 34 demersal fish - catch lower for 19 species in hypoxic areas (DO<1.43 mL L^{-1})
- Community effects (total catch and species richness) exhibited significant decrease with low DO (Fig. 1)
- Analysis revealed threshold effect for multiple species where small changes in DO at low levels produced large changes in catch (Fig. 2)

Threshold Effects

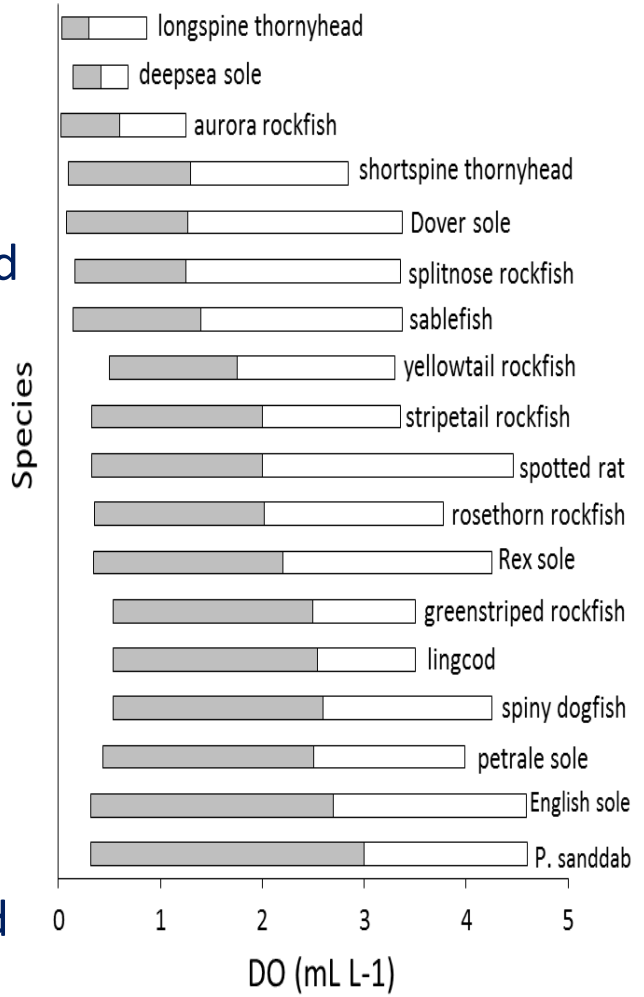

Fig. 2. Shaded areas show range of DO over which CPUE decreased rapidly by species

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Dynamic population trends observed in the deep-living Pacific flatnose, *Antimora microlepis*, on the U.S. West Coast

Peter H. Frey, Aimee A. Keller, Victor Simon

FRAM Division, Northwest Fisheries Science Center, Seattle WA

Deep Sea Research Part I (2017) 122: 105 – 112
DOI: 10.1016/j.dsr.2017.03.006

Pacific flatnose

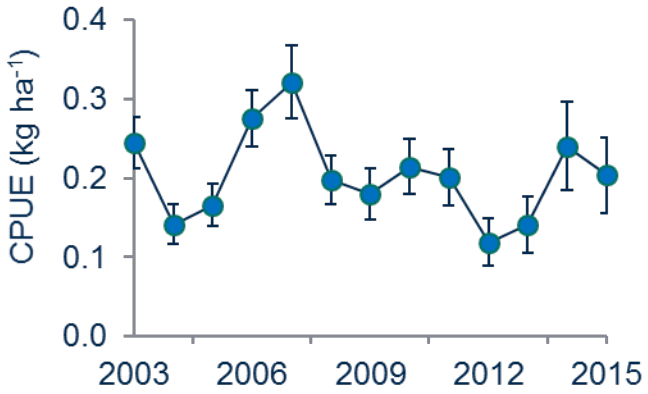

Fig 1. Mean CPUE

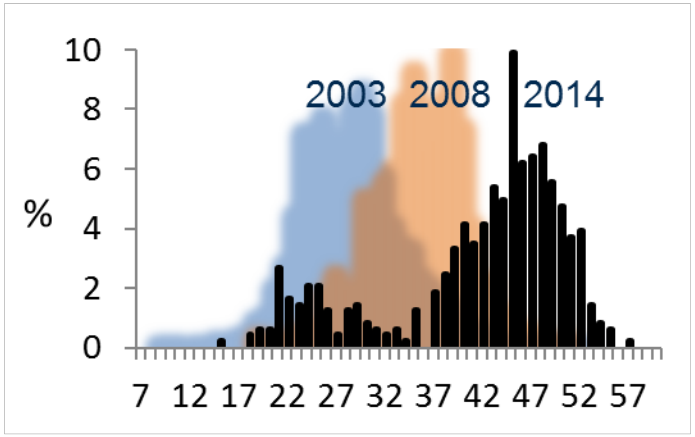

Fig 2. Mean fork-length (cm)

- Relatively stable CPUE from 2003 to 2015, but episodic recruitment
- Fork-length and depth of capture increased significantly over time with advancement of strong year classes
- Low female percentage indicated significant portion of spawning stock may reside beyond 1280 m survey depth limit
- Otolith weight a useful proxy for age in growth models

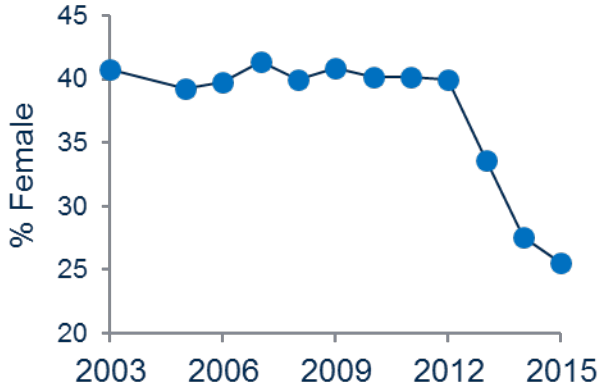

Fig. 3. Percent females

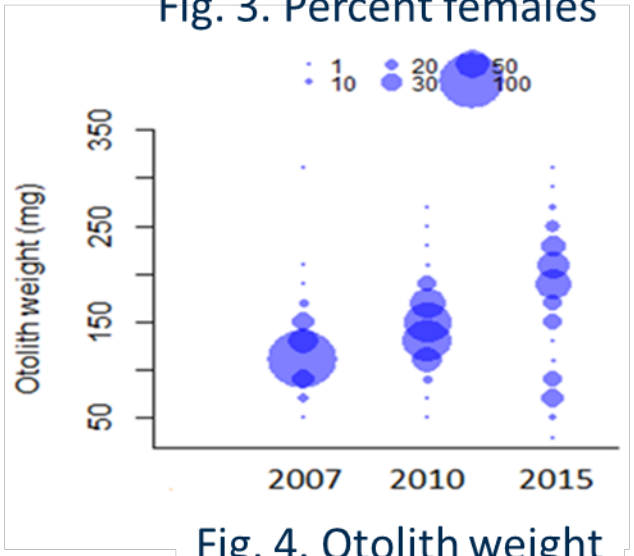

Fig. 4. Otolith weight

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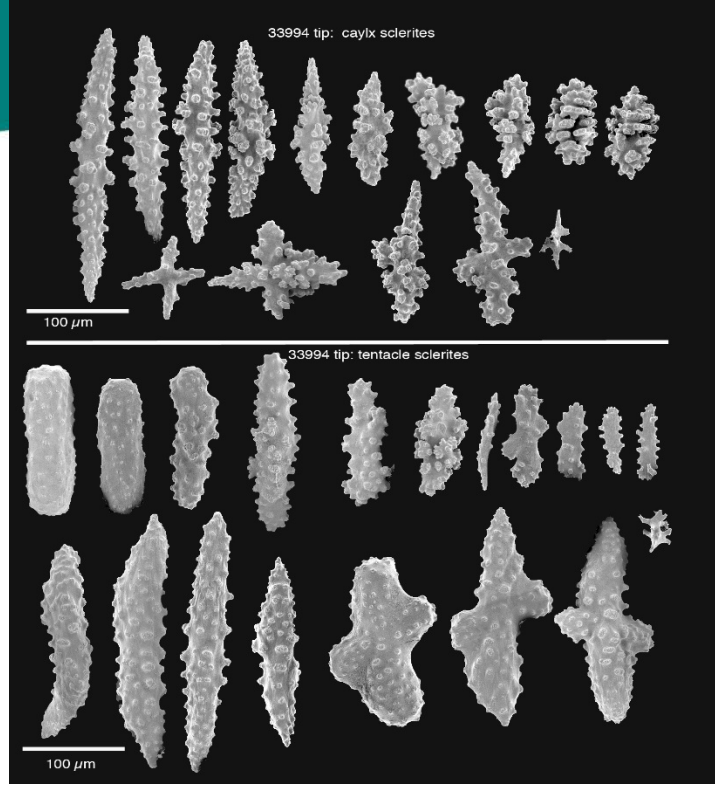

Large-scale genotyping-by-sequencing reveals lack of structure in the deep-sea octocoral *Swiftia simplex* (Nutting 1909) on the west coast of the United States

Meredith Everett[1], Linda Park[2], Ewann Berntson[2], Anna Elz[2], Curt Whitmire[3], Aimee Keller[3], and M. Elizabeth Clarke[4]

[1]National Research Council, Northwest Fisheries Science Center, Seattle , WA
[2]Conservation Biology, NWFSC, Seattle , WA
[3]Fishery Resource Analysis and Monitoring, NWFSC, Seattle , WA
[4]Office of the Science Director, NWFSC, Seattle, WA

PLoS ONE 11(10): e0165279. doi:10.1371/journal.pone.0165279

- First study to use DNA-tag sequencing to evaluate connectivity among 23 individuals of deep-sea coral, *Swiftia simplex*
- Failed to detect any population structure across all areas after genotyping 1145 SNPs
- Even after assignment to hypothesized populations (Fig. 1) no significant isolation detected (Fig. 2)
- Conclude potential panmixia in *S. simplex* along continental shelf (CA – WA)

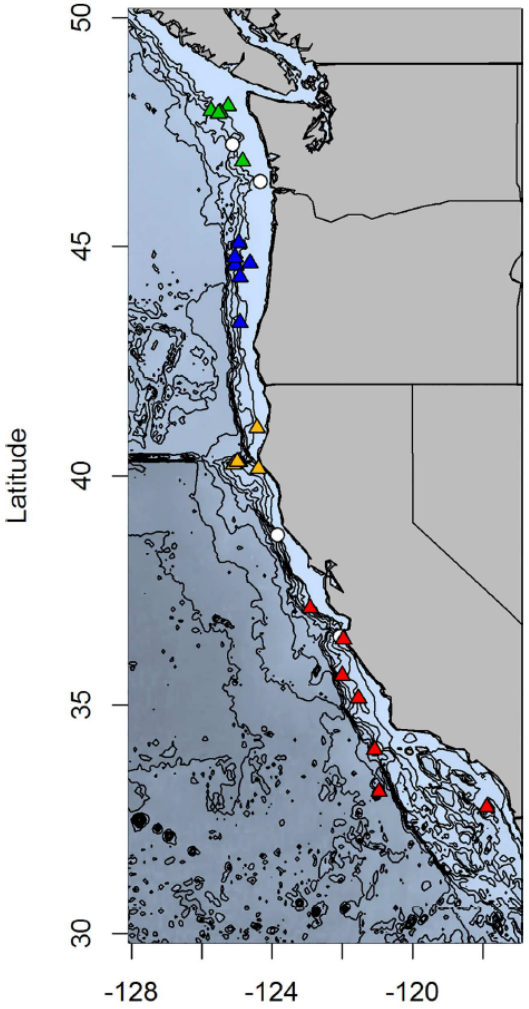

Fig 1. Locations of 23 *S. simplex* used in study - colors represent hypothesized geographic populations

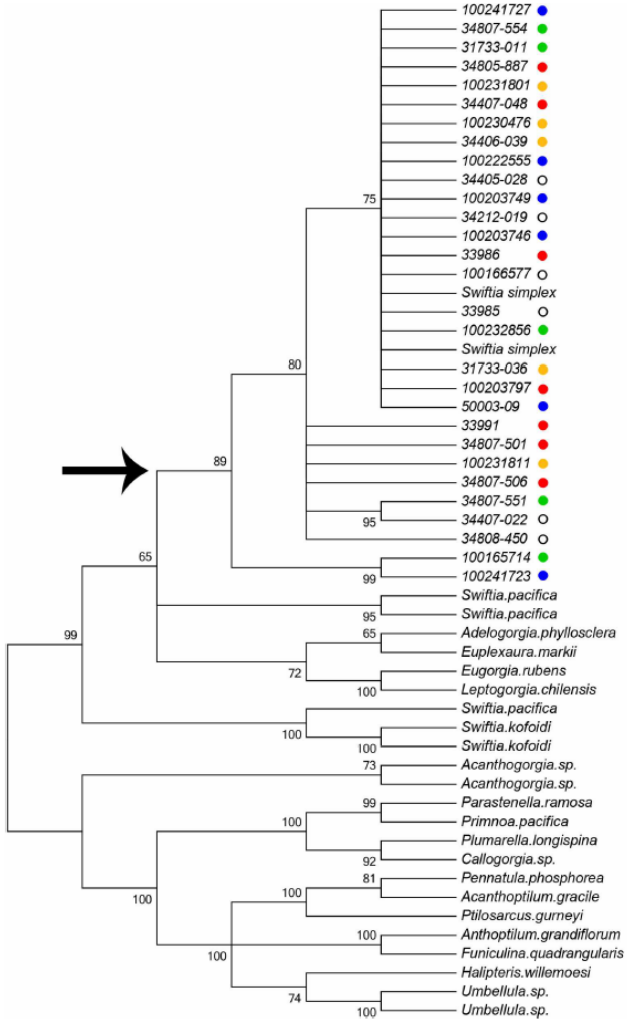

Fig 2. Arrow indicates branch for all 23 *S. simplex* individuals, colors correspond to hypothesized populations in Fig. 1; additional species shown

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Evaluation of alternative modelling approaches to account for spatial effects due to age-based movement

Hui-Hua Lee[a], Kevin R. Piner[a], Mark N. Maunder[b,c], Ian G. Taylor[d], and Richard D. Methot, Jr.[e]

[a] Southwest Fisheries Science Center

[b] Inter-Americal Tropical Tuna Commission

[c] Center for the Advancement of Population Assessment Methodology

[d] Northwest Fisheries Science Center

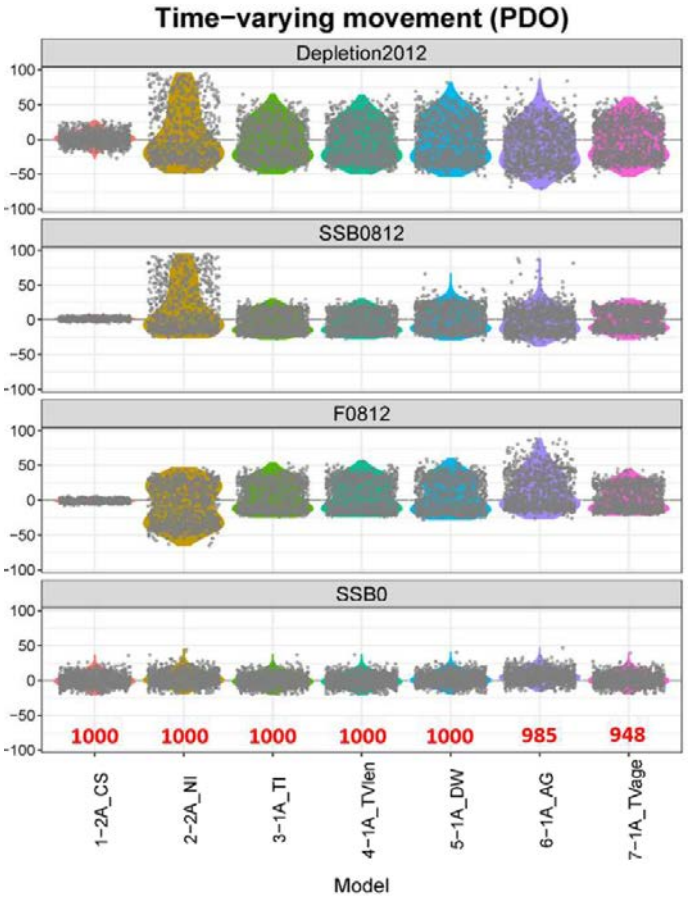
[e] NMFS Senior Scientist for Stock Assessments

Canadian Journal of Fishery and Aquatic Sciences

published on the web 02 May 2017, issue and page numbering not yet available

Testing alternative stock assessment methods for highly migratory stock exhibiting movement

- Based on Pacific Bluefin Tuna but has implications for modeling any migratory population
- Assessment model that explicitly estimated movement performed best when based on accurate assumptions
- Simpler models that implicitly estimated movement were more stable
- Ignoring movement resulted in worst performance



Questions?