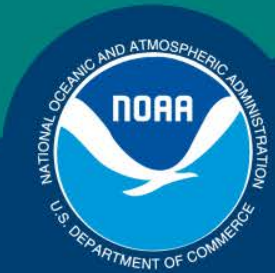


Science, Service, Stewardship

Agenda Item I.1.a
Supplemental NWFSC PowerPoint 2
(Electronic Only)
November 2015



Groundfish Science Report

Michelle McClure and Mark Strom
Northwest Fisheries Science Center

November 16, 2015



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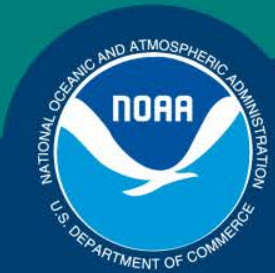




Overview

- NMFS efforts – climate change
- Winter hake survey
- Even-year science
- Quota market description
- Groundfish mortality report

Science, Service, Stewardship



California Current Fisheries Climate Vulnerability Assessment:

An application of the NMFS Climate Vulnerability Protocol

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Climate Vulnerability Assessment Process

1 Scoping and Planning

Engage with partners and stakeholders

Define scope:

- Study Area

- Stocks

- Identify regional climate factors

- Identify and task leaders, staff, and experts

2 Assessment Preparation

Compile:

- Species profiles

- Climate projections

- Distributional information

3 Scoring

- Train experts (webinar)

- Perform preliminary scoring (individuals)

- Compile preliminary results

- Discuss results (workshop)

- Complete final scoring

4 Results

Compile:

- Tables and figures

- Sensitivity analysis

- Draft Reports

- Species vulnerability narratives

- Submit to internal and peer review

5 Communication

- Engage with stakeholders

- Identify key climate vulnerability drivers

- Identify important data gaps

- Develop science priorities

- Investigate management options

- Develop adaptation strategies

- Update assessment as needed



Current Status

- Groundfish, salmon, CPS, HMS, protected species/stocks selected
- Climate factors selected
- Species profiles complete or near complete
- Compilation of climate information underway
- Planning expert workshop for scoring each species



Methodology Framework

Stock Vulnerability

Exposure

Sea surface temperature
Air temperature
Salinity
Ocean acidification (pH)
Precipitation
Currents
Sea level rise

*** Exposure factors will vary depending on the region*

Sensitivity

- Habitat Specificity
- Prey Specificity
- Sensitivity to Ocean Acidification
- Sensitivity to Temperature
- Stock Size/Status
- Other Stressors
- Adult Mobility
- Spawning Cycle
- Complexity in Reproductive Strategy
- Early Life History Survival and Settlement Requirements
- Population Growth Rate
- Dispersal of Early Life Stages



Western Regional Action Plan for Climate Science

- California Current and associated watersheds
- Aimed at identifying a few, attainable science actions to inform fisheries and PR management, given climate change
- Expect stakeholder engagement in 2016
- Final due October 2016



2016 Winter Hake Survey



Bell M. Shimada

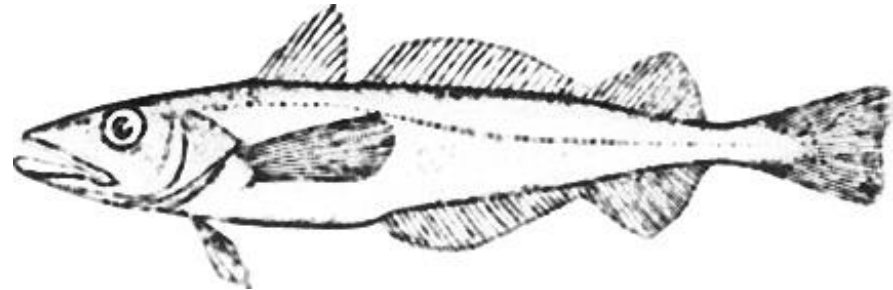
- Leg 1: 1/9 – 1/23
Newport to San Francisco
- Leg 2: 1/26 – 2/9
San Francisco to Newport



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Survey Purpose



To evaluate feasibility, and inform design, of future spawning biomass survey

The 2016 winter survey will characterize:

- Distribution of spawning hake (N-S, nearshore-offshore)
- Spawning aggregations (size, extent)
- Hake within spawning aggregations (length, weight, sex, age, maturity, genetics)



Survey Rationale

Many migratory stocks around world surveyed during spawning

- Population in smaller area, so less survey effort.
- Greater accuracy in biomass estimates.

In summer, hake are spread BC (or AK) to CA

- Current survey takes 80 (U.S.) + 30 (Canada) days at sea.
- Migration during survey and potential biases in estimates unknown.

Long-running discussion of West Coast hake spawning survey

- Could we survey a smaller area and get a better estimate?
- Many unknowns about hake during spawning.



2016 Winter Hake Survey

What we know

- CalCOFI egg & larvae data
- WCGOP bottom trawl hake presence (Jan-Feb)
- Anecdotal & industry/research observations
- Consultation with outside experts



2016 Winter Hake Survey

What we know we don't know

- Where are spawning hake?
- Are there 2 spawning typologies (nearshore, offshore)?
- What is the population structure?
- Will hake spawn early because of El Niño?
- Once spawned, what do hake do?
- Where will age-1 and age-2 fish be?
- Will low autumn 2015 hake catches affect winter?
- How bad will the weather be?

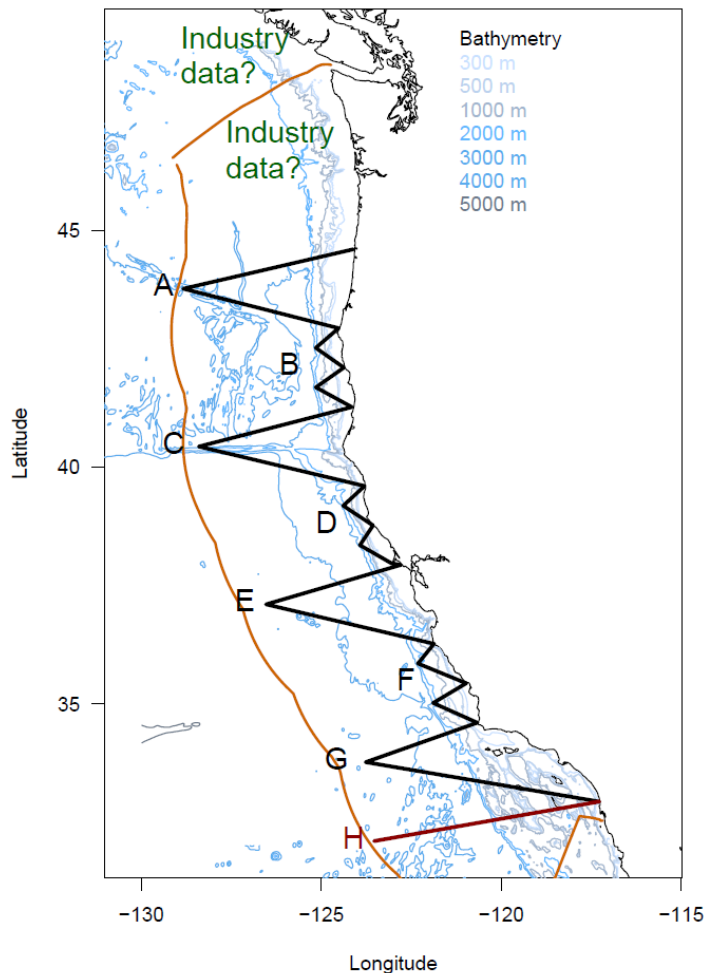
*Shimada
on winter
survey?*

Cliff Mass 9/2/2015
Godzilla El Niño
versus the BLOB:
who will win?





Draft Design and Sampling Plan



Acoustics at 18, 38, 70, 120 & 200 kHz

- *Along transects (black lines)*
- *On hake aggregations for size, extent*
- *Stationary dawn/dusk above aggregations*

Midwater trawling

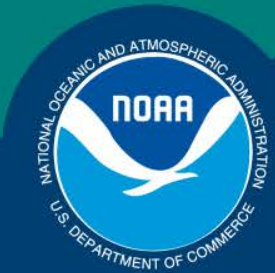
- *Are these hake?*
- *Are they spawning?*
- *Are aggregations heterogeneous?*

Oceanographic sampling

- *Zooplankton tows (summer 2015 locations)*
- *CTD casts*
- *Sensors on midwater trawls*
- *Underway sensors (temperature, etc.)*
- *ADCP continuously for currents*

24-hour acoustic & wet lab operations

Science, Service, Stewardship



Overview of NMFS Even-year Groundfish Science Priorities

Michelle McClure and Jim Hastie

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Categories of Research We Do

- Conceptually
 - Understanding our system – drivers and responses
 - Improving our data
 - Improving assessment methods
- Drivers
 - National mandates and priorities
 - Council priorities
 - Assessment- and review-driven needs
 - Feasibility



Council Advisory Body Priority Research Areas

1. Historical landings time series workshop [SSC, GMT, GAP]
 - Dependent on time series availability
2. Bmsy proxies and related topics workshop [SSC, GMT, GAP]
 - Key need: SSC develop work products
3. Recreational CPUE methods, and data [SSC, GMT, GAP]
 1. Exploration of data-moderate assessment methods [GMT]
 1. Data weighting workshop [SSC]
 - CAPAM held recent workshop



NMFS Must-Dos

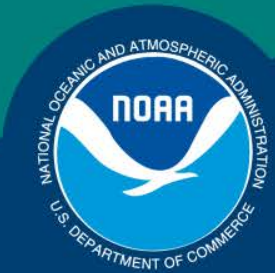
1. Stock assessment prioritization -- collate data for proposed standard approach
2. Improvements to assessment modeling/software (Stock Synthesis)
3. Fishery Climate Vulnerability Analysis and Regional Action Plan
4. Program Review of Ecosystem Science and IEA Update
5. Evaluate impact of input levels on assessment output
6. Hake Assessment



Additional Research Areas

- Management strategy evaluations
- Age-determinations
- Coding (R4SS, etc.) improvements
- Fishery CPUE indices
- Spatial methods
- Evaluation of change in variance in projected biomass with time

Science, Service, Stewardship



The Anatomy of a Multispecies Individual Fishing Quota (IFQ) “Market” in Development

Dan Holland and Karma Norman
Northwest Fisheries Science Center

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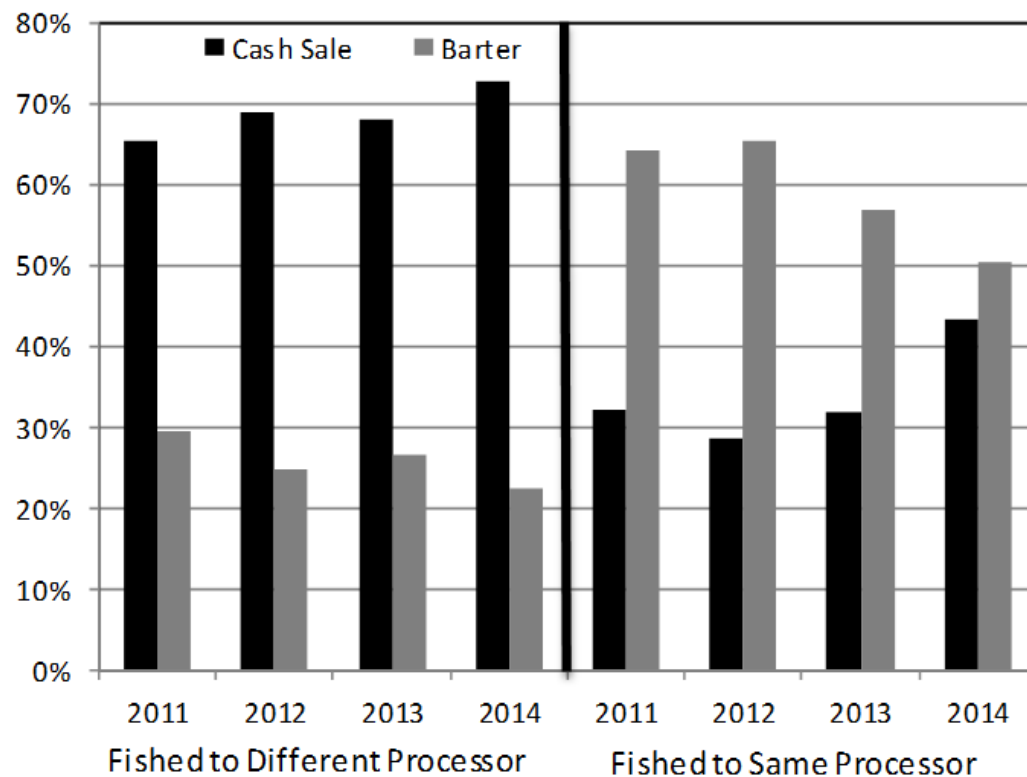


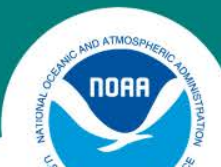
Transfer Activity In Pacific Groundfish Trawl IFQ Quota Pounds Market 2011-2014

Transfer	2011		2012		2013		2014	
Type	Single	Multi	Single	Multi	Single	Multi	Single	Multi
Cash Sale	292	101	340	67	384	63	411	62
Barter	223	66	275	48	262	35	191	37
Cash and Barter	23	11	37	11	48	12	31	9
Other	409	201	606	260	663	400	596	360
Self-Trade	423	408	512	308	641	327	528	326
All Transfers	2157		2464		2835		2551	

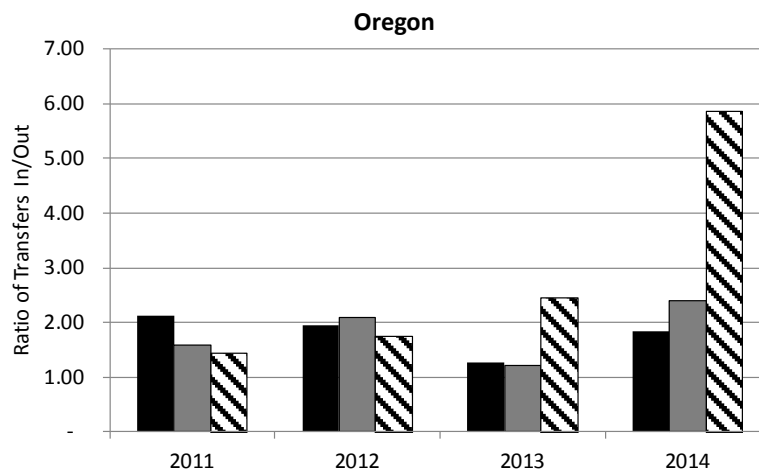
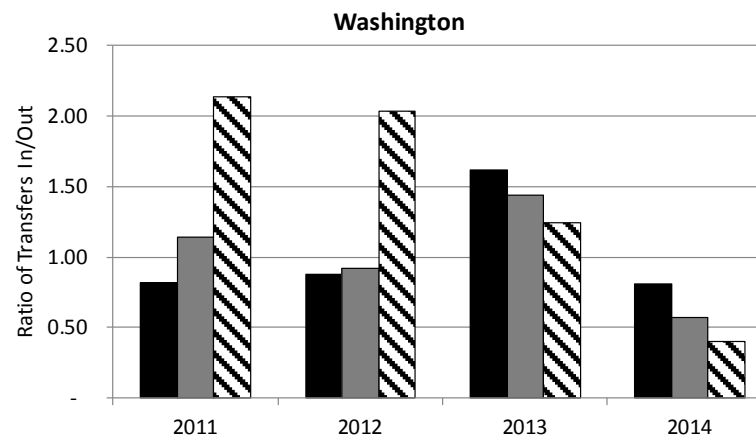
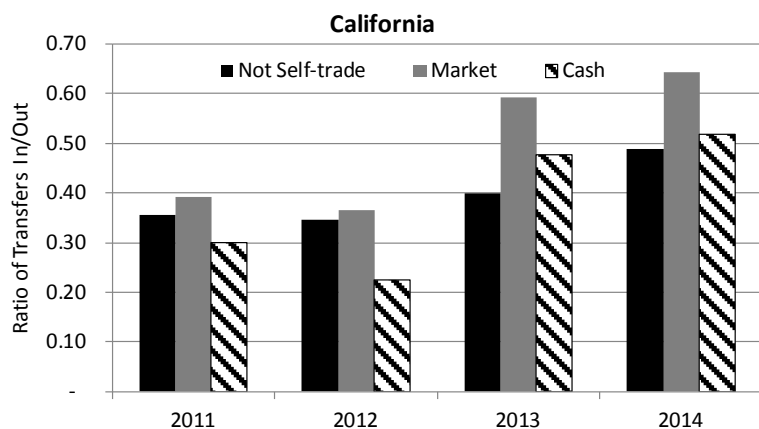


Percent of Annual Cash and/or Barter Transfers that were Cash Sales vs. Barter Depending on Whether the Parties Involved Landed Fish to the Same Processor or Not





Ratio of Transfers INTO a State over Transfers OUT OF the State by Type of Transfer for Transfers occurring in the Years 2011-2013





Prices, Price Dispersion, and Counts for Cash Sales of Quota Pounds

OPTIMAL_YIELD_CATEGORY	2011			2012			2013			2014			Average Pounds Tranferred
	Price	C.V.	Count	Price	C.V.	Count	Price	C.V.	Count	Price	C.V.	Count	
Bocaccio rockfish South of 40°10' N.		42%	3		0%	1	\$ 0.20	17%	4		15%	7	1,449
Canary rockfish		18%	4	\$ 1.49	57%	15	\$ 3.09	26%	12	\$2.12	35%	17	300
Cowcod South of 40°10' N.		10%	2		101%	2		54%	4		35%	2	13
Darkblotched rockfish	\$ 0.40	119%	4	\$ 0.22	49%	6	\$ 0.53	51%	10	\$1.08	22%	10	1,947
Pacific halibut (IBQ) North of 40°10' N.	\$ 1.31	45%	5	\$ 1.19	19%	10	\$ 1.76	51%	21	\$0.58	64%	15	1,007
Pacific ocean perch North of 40°10' N.		69%	3		56%	3	\$ 0.75	45%	14	\$0.98	44%	15	1,073
Widow rockfish	\$ 0.44	62%	6	\$ 0.34	57%	9	\$ 0.53	45%	10	\$0.23	45%	34	6,933
Yelloweye rockfish		105%	4	\$ 21.76	33%	9	\$ 29.58	53%	11	\$27.07	10%	12	10
Pacific whiting	\$ 0.02	70%	29	\$ 0.04	31%	65	\$ 0.04	43%	54	\$0.03	47%	29	179,150
Petrale sole	\$ 0.34	29%	38	\$ 0.40	12%	20	\$ 0.25	32%	50	\$0.28	16%	58	10,448
Sablefish North of 36° N.	\$ 1.06	41%	58	\$ 1.04	36%	47	\$ 0.88	17%	66	\$1.00	26%	62	10,303
Sablefish South of 36° N.	\$ 0.76	54%	62	\$ 1.05	9%	31	\$ 0.26	31%	8	\$0.16	37%	22	6,922



Conclusions

- The quota pounds market is thin with relatively few market transactions for all but a few major target species.
- Few cash transactions make price discovery difficult (hard to know what to charge and what to pay).
- Barter is more common than cash trades when individuals fish to the same processor.
- Quota pounds are flowing into Oregon from other states.
- The study suggests the market is not efficient – yet.



Estimated Discard and Catch of Groundfish Species in the 2014 US West Coast Fisheries

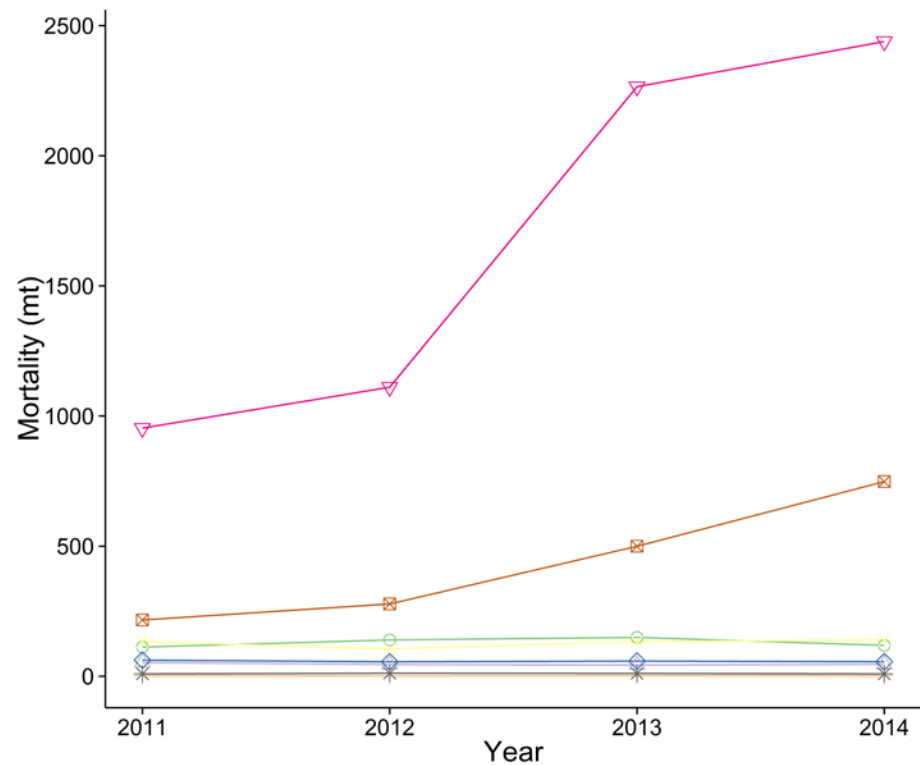
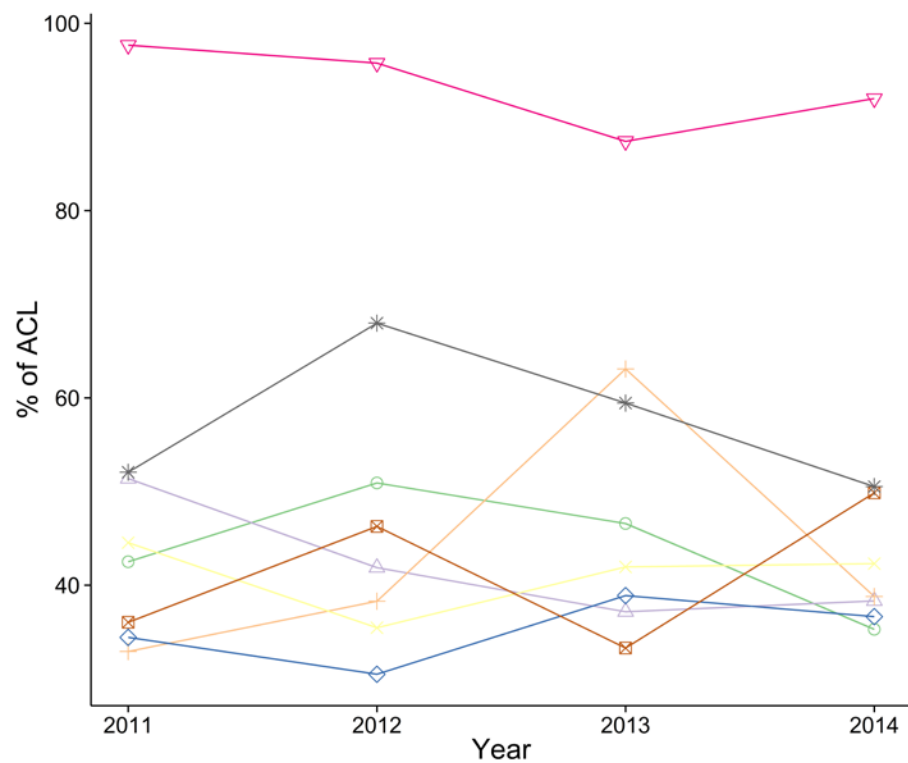
Kayleigh A. Somers, Jason Jannot, Yong-Woo Lee, Neil Riley,
Vanessa Tuttle, Jon McVeigh

November 2015



2014 Mortality Estimates

- California scorpionfish – south of 34°27' N. latitude was the only species to exceed OFL harvest goals (103%).
 - 98% of mortality occurred in the California Recreational fishery.
- Estimated fishing mortality of 3 additional species was >80% of ACL:
 - petrale sole (91%)
 - sablefish, north of 36° N. latitude (88%)
 - black rockfish, south of 46°16' N. latitude (86%)
- 28 FMP-listed groundfish species or complexes (67%) had fishing mortality estimates <50% of 2014 ACL harvest goals.



Species

- BOCACCIO ROCKFISH (SOUTH OF 40°10' N. LAT.)
- △ Canary rockfish
- + COWCOD ROCKFISH (SOUTH OF 40°10' N. LAT.)
- × DARKBLOTCHED ROCKFISH
- ◇ PACIFIC OCEAN PERCH (NORTH OF 40°10' N. LAT.)
- ▽ Petrale sole
- ⊠ Widow rockfish
- * YELLOWEYE ROCKFISH

Rebuilding species are capitalized