

Pacific ocean perch 2017 Assessment

Biology and Data

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STAR Panel
June 26-30, 2017

Outline

Biology

Overview

Maturity

Fecundity

Growth

Removals

Indices of Abundance

Length Compositions

Age Compositions

Pacific ocean perch (*Sebastes alutus*)

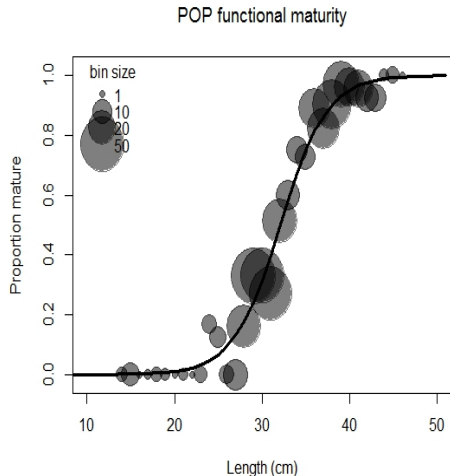
- Distributed from Alaska Aleutian Islands to Northern California
- Typically 200 - 400 meters during summer months
- Semi-demersal and can be pelagic
- Both sexes move to deeper water with age
- Female move to deeper waters post-spawning during winter months and return inshore in spring.



Maturity

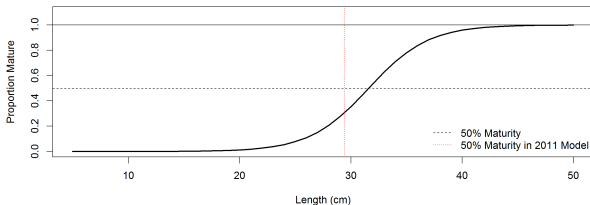
Functional maturity-at-length

- Categorized mature and immature fish based on the proportion of vitellogenin in the cytoplasm and atretic cells
- 50% maturity is at larger lengths vs. biological maturity
- functional 50% = 32.1 cm vs. biological 50% = 30.1 cm

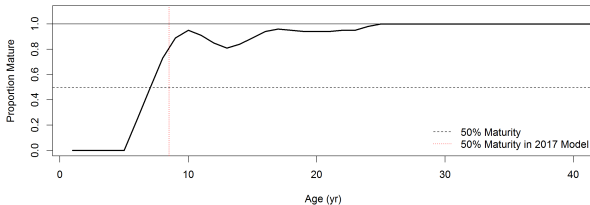


Maturity Comparison

Functional Maturity by Length (2017 Assessment)

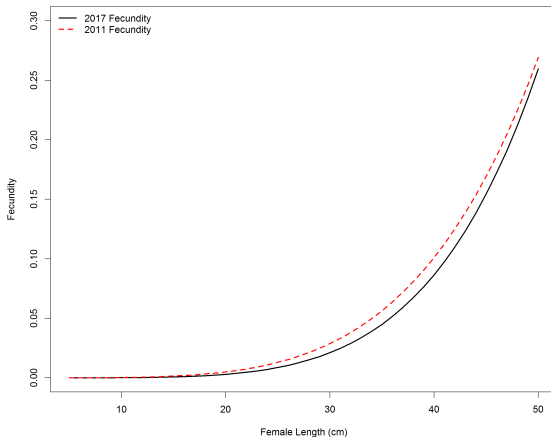


Maturity by Age (2011 Assessment)



*Sensitivity assumed maturity shown to not have a large impact on results

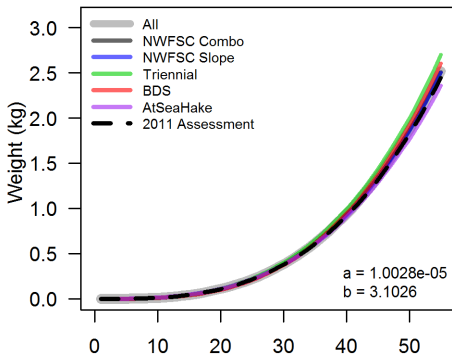
Fecundity



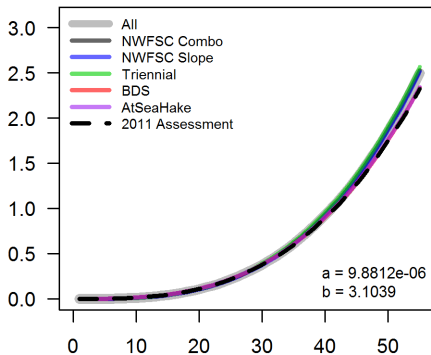
*Sensitivity to assumed fecundity shown to not have a large impact on results

Weight-at-length

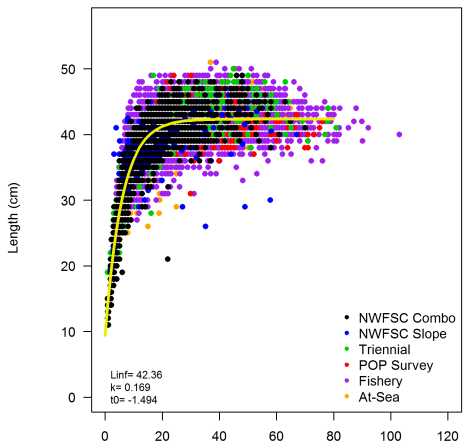
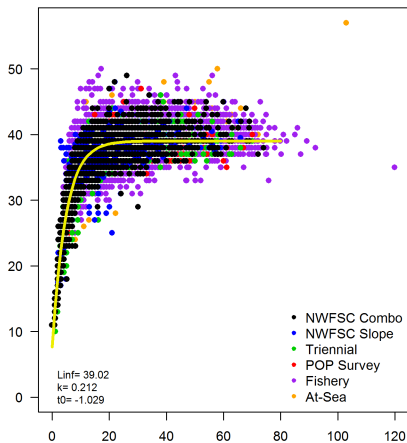
Female



Male

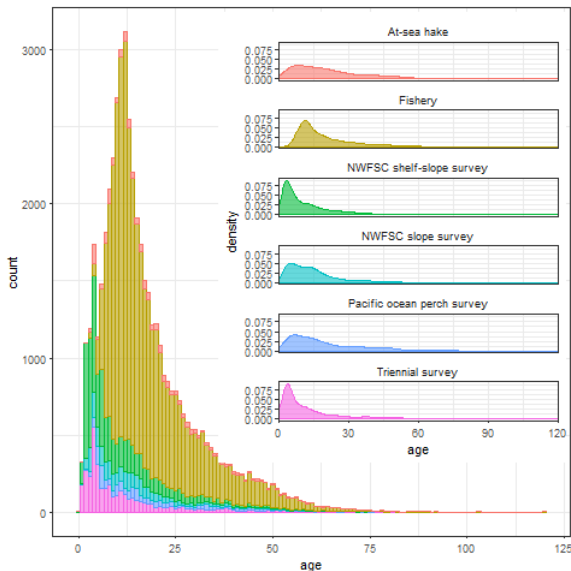


Length-at-age

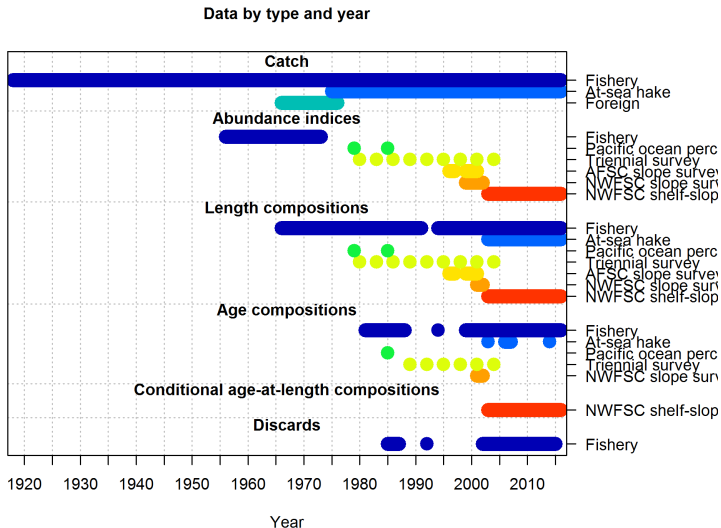
Female**Male**

Observed Ages

- Oldest age: 120 by the fishery (2007)
- Next oldest fish range from 90-103 collected by fishery and At-sea hake between 1981-2010



Data Summary Used in the 2017 Assessment



Outline

Biology

Removals

- Landing history by state
- Discarding practices

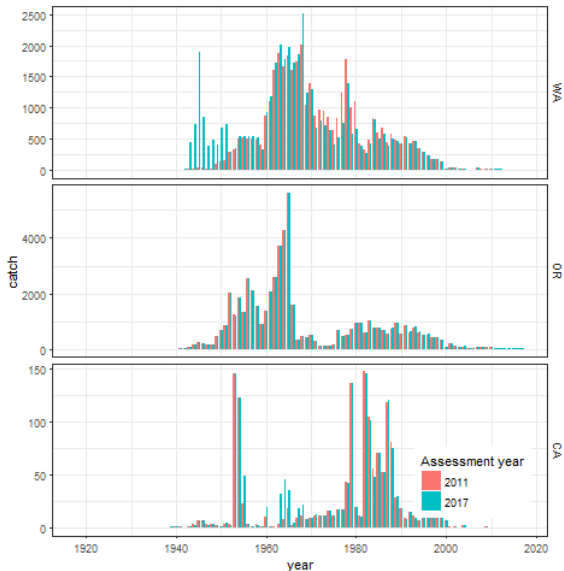
Indices of Abundance

Length Compositions

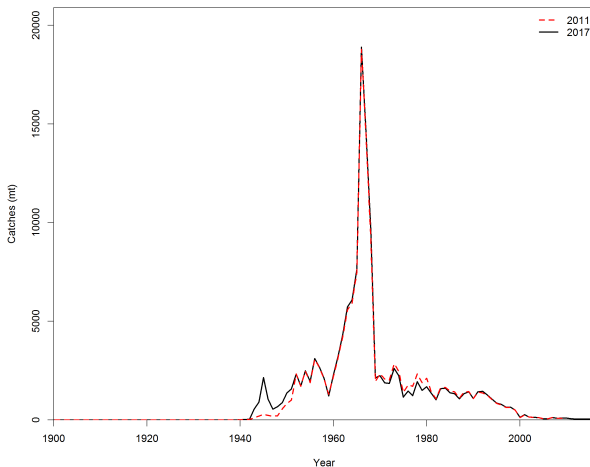
Age Compositions



Landings Data: 2017 vs. 2011

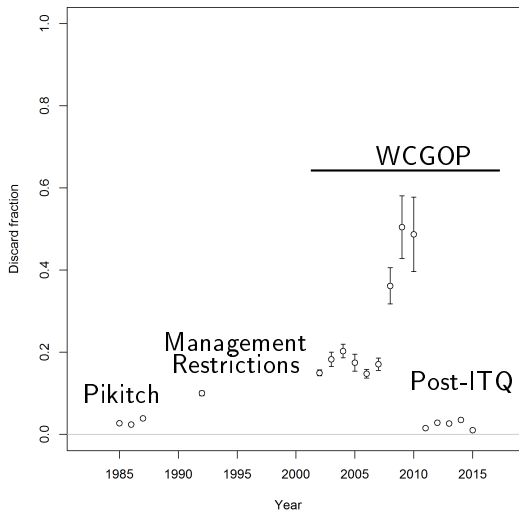


Cummalative catch difference



*Resulted in $< 1\%$ change in $R0$

Fishery Discard Data



Outline

Biology

Removals

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Fishery CPUE

Survey Indices

Length Compositions

Age Compositions



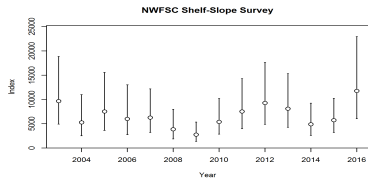
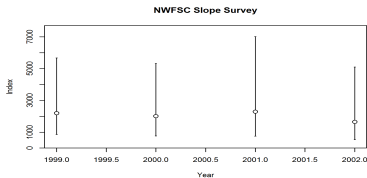
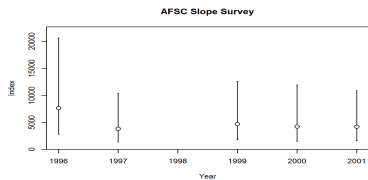
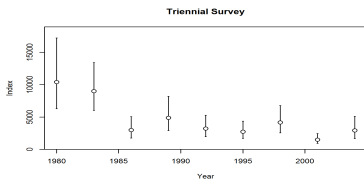
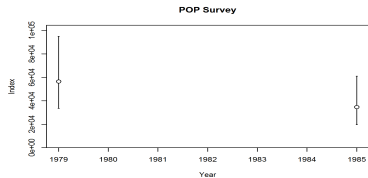
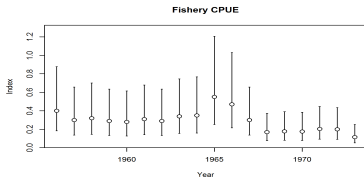
CPUE



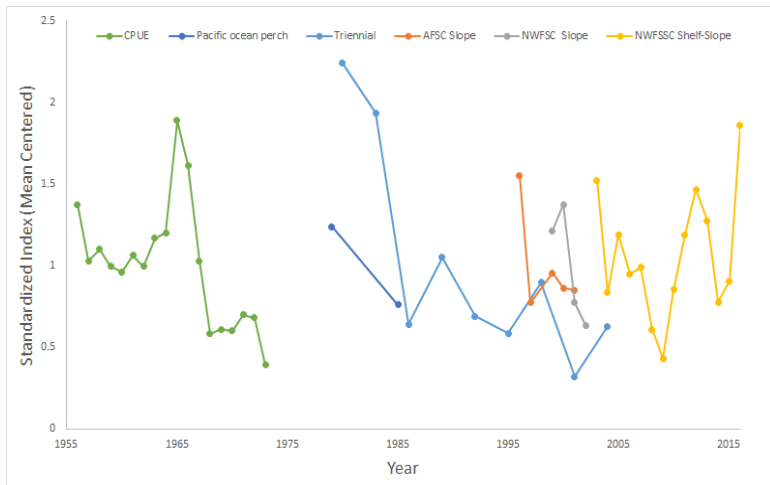
Gunderson (1977) CPUE from the INPFC Columbia area

*Sensitivity shows little effect on model results when removed.

Survey Indices



All: standardized



Biology
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Removals
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Indices of Abundance
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Length Compositions
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Age Compositions
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Survey Indices: 2011 vs. 2017

Outline

Biology

Removals

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Length Compositions

Fishery Lengths

Survey Lengths

Age Compositions



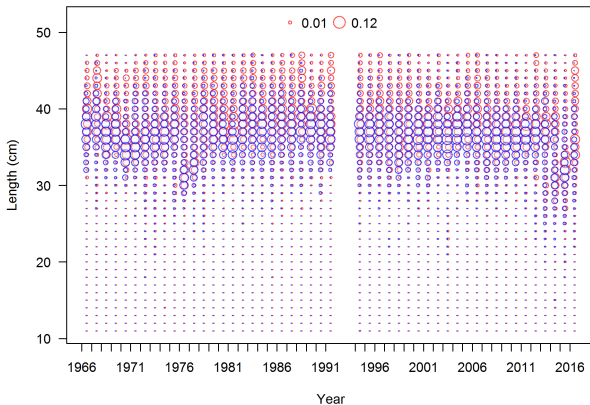
Fishery Length Data

Fishery length data used in the 2017 assessment:

- Fishery: bottom trawl, mid-water trawl, fixed gear
 - Retained Lengths 1966-2016
 - Discarded Lengths 1986 (Pikitch), 2004-2015
- At-sea hake fishery
 - All (Retained and Discarded) Lengths 2003-2016

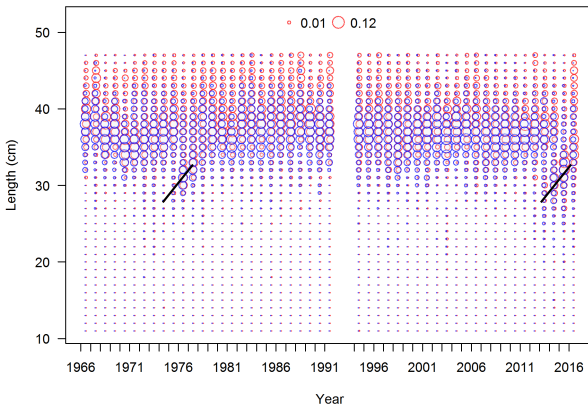
Fishery Lengths: Retained

Length comp data, retained, Fishery (max=0.13)

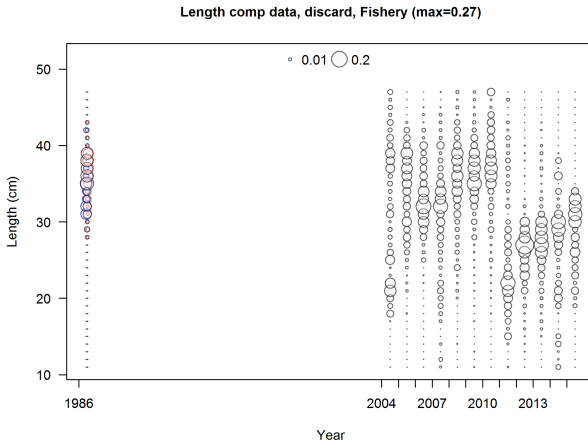


Fishery Lengths: Retained

Length comp data, retained, Fishery (max=0.13)

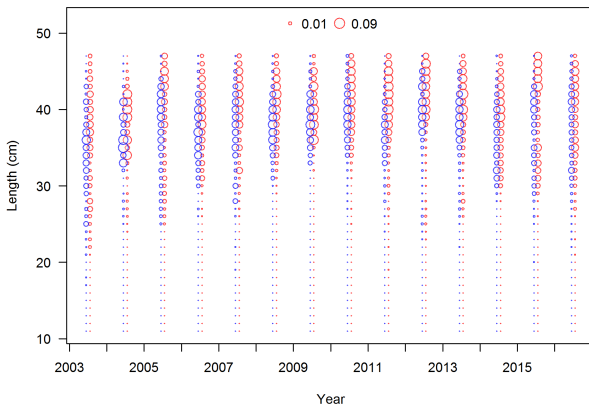


Fishery Lengths: Discarded



At-sea hake lengths

Length comp data, whole catch, At-sea hake (max=0.08)

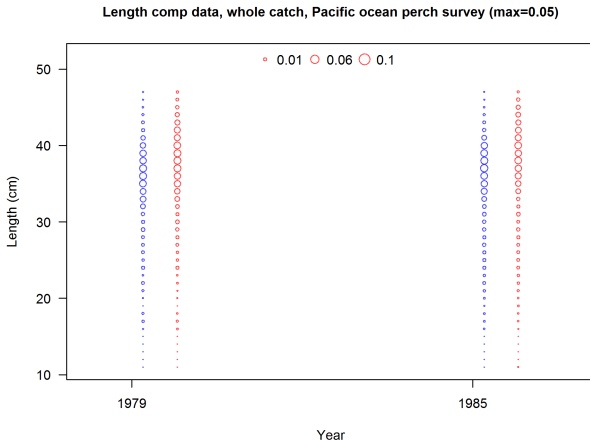


Survey Length Data

Survey length data used in the 2017 assessment:

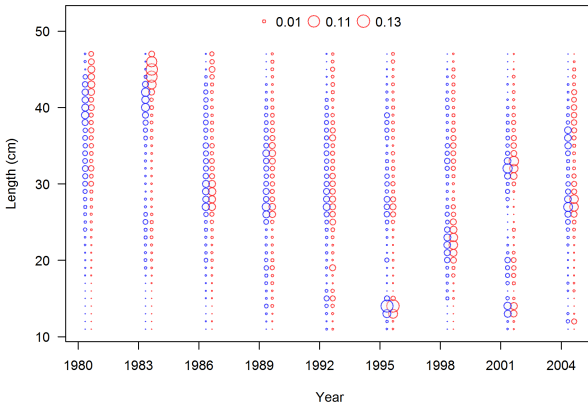
- Pacific ocean perch survey
 - 1979 and 1985
- Triennial survey
 - 1980, 1983, 1896, 1989, 1992, 1995, 1998, 2001, 2004
- AFSC slope survey
 - 1996, 1997, 1999-2001
- NWFSC slope survey
 - 2001 and 2002
- NWFSC shelf-slope survey
 - 2003-2016

Pacific ocean perch survey lengths

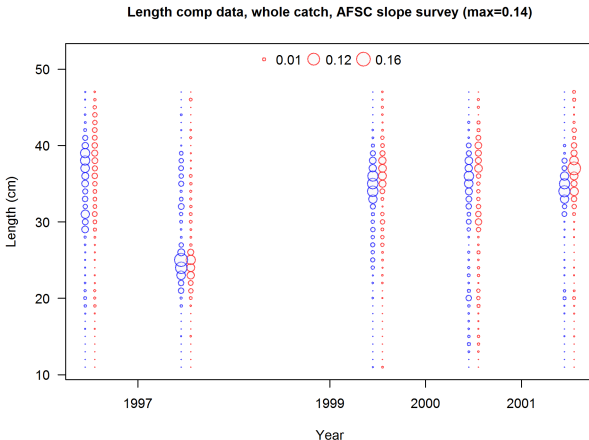


Triennial survey lengths

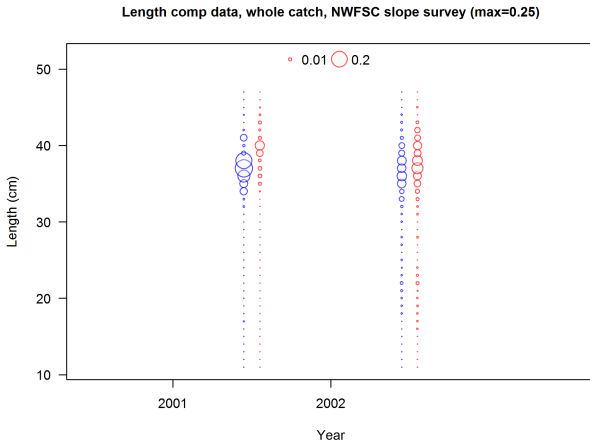
Length comp data, whole catch, Triennial survey (max=0.13)



AFSC slope survey lengths

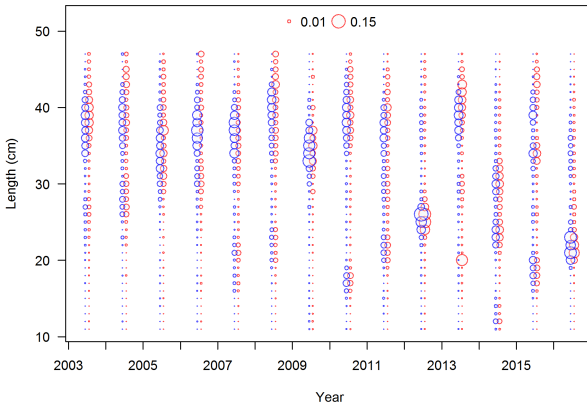


NWFSC slope survey lengths

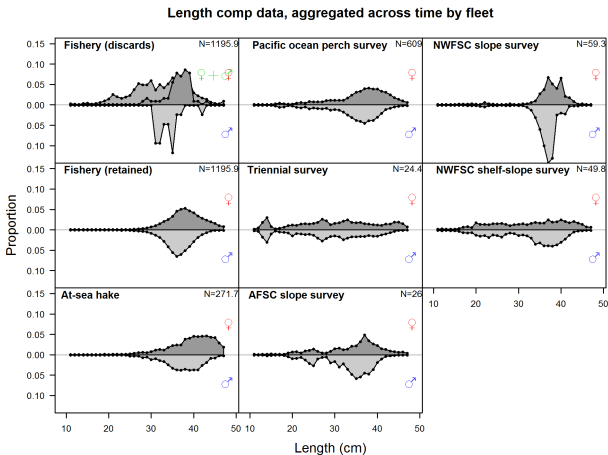


NWFSC shelf-slope survey lengths

Length comp data, whole catch, NWFSC shelf-slope survey (max=0.16)



Aggregated lengths by source



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Fishery Ages

Survey Ages



Fishery Age Data

Fishery age data used in the 2017 assessment:

- Fishery: bottom trawl, mid-water trawl, fixed gear
 - 1981-1988, 1994, 1999-2016
- At-sea hake fishery
 - 2003, 2006, 2007, 2014

Survey Age Data

Survey age data used in the 2017 assessment:

- Pacific ocean perch survey
 - 1985
- Triennial survey
 - 1989, 1992, 1995, 1998, 2001, 2004
- NWFSC slope survey
 - 2001 and 2002
- NWFSC shelf-slope survey
 - 2003-2016