

# Status of Cabezon (*Scorpaenichthys marmoratus*) in California and Oregon Waters as Assessed in 2009



by

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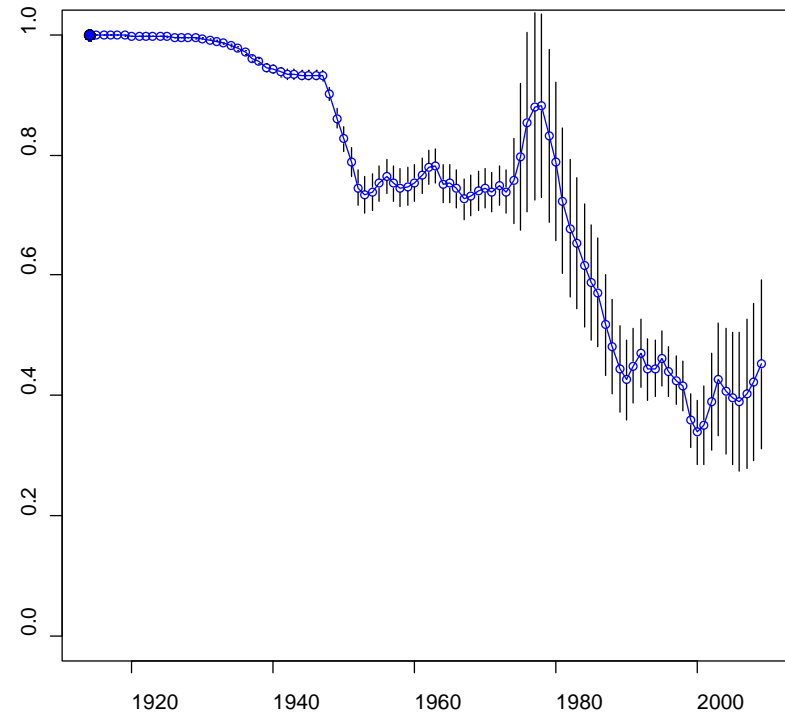
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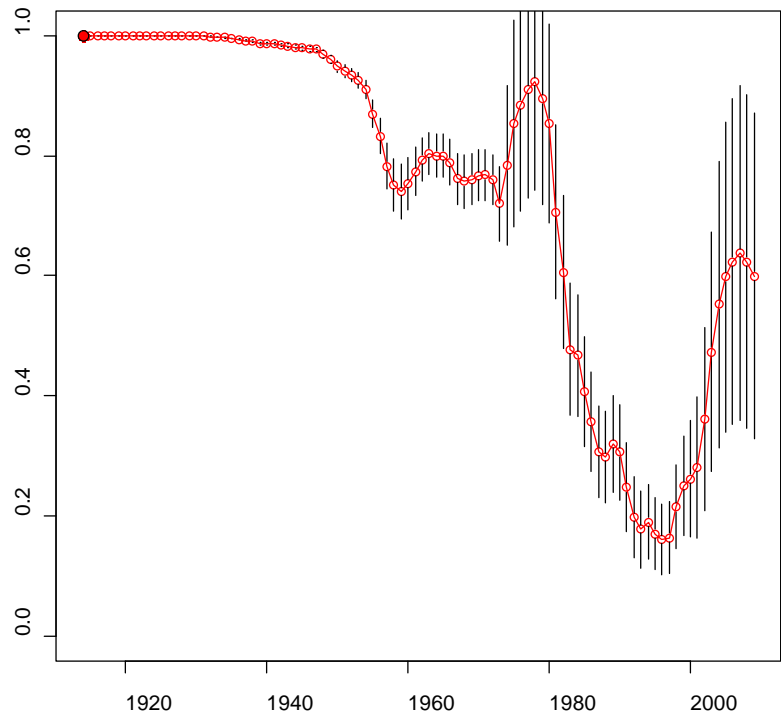
# Base Case: NCS



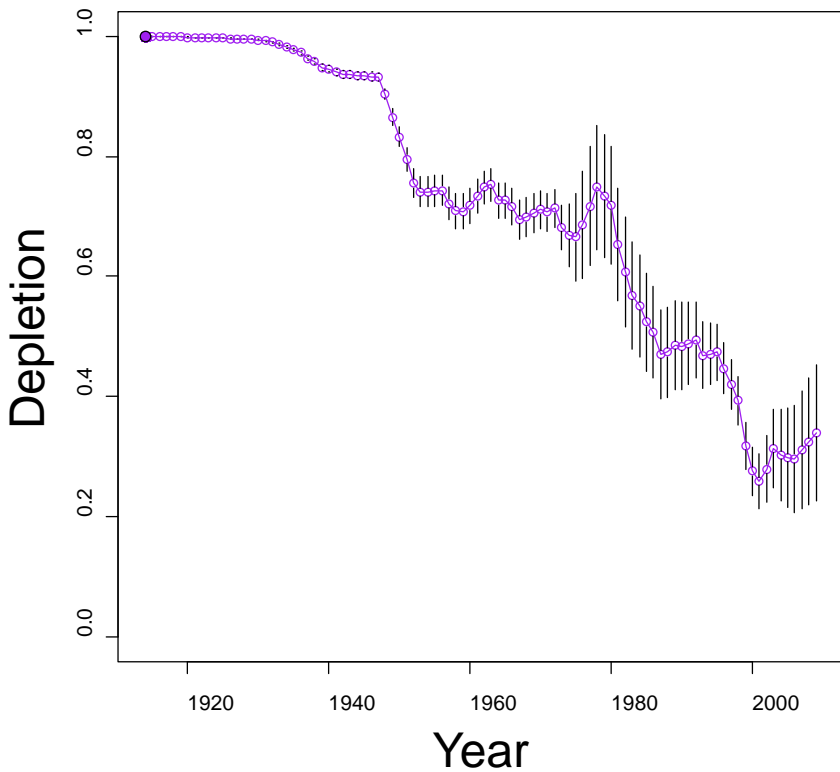
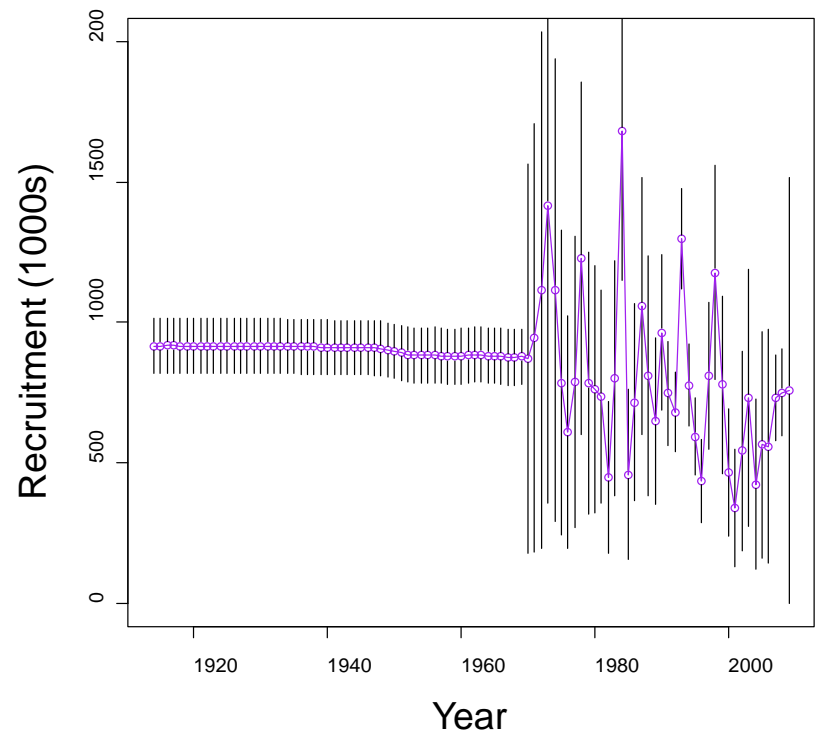
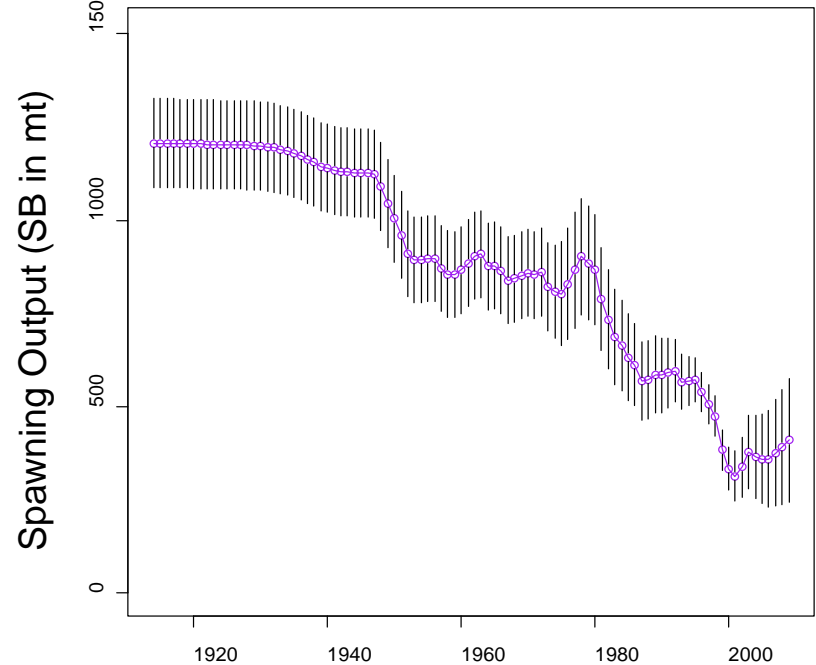
$SB_{1916}$ : 1036 mt

$SB_{2009}$ : 469 mt

Depletion: 45%



# Base Case: CAS



Spawning Output (SB in mt)

$SB_{1916}$ : 1207 mt

$SB_{2009}$ : 410 mt

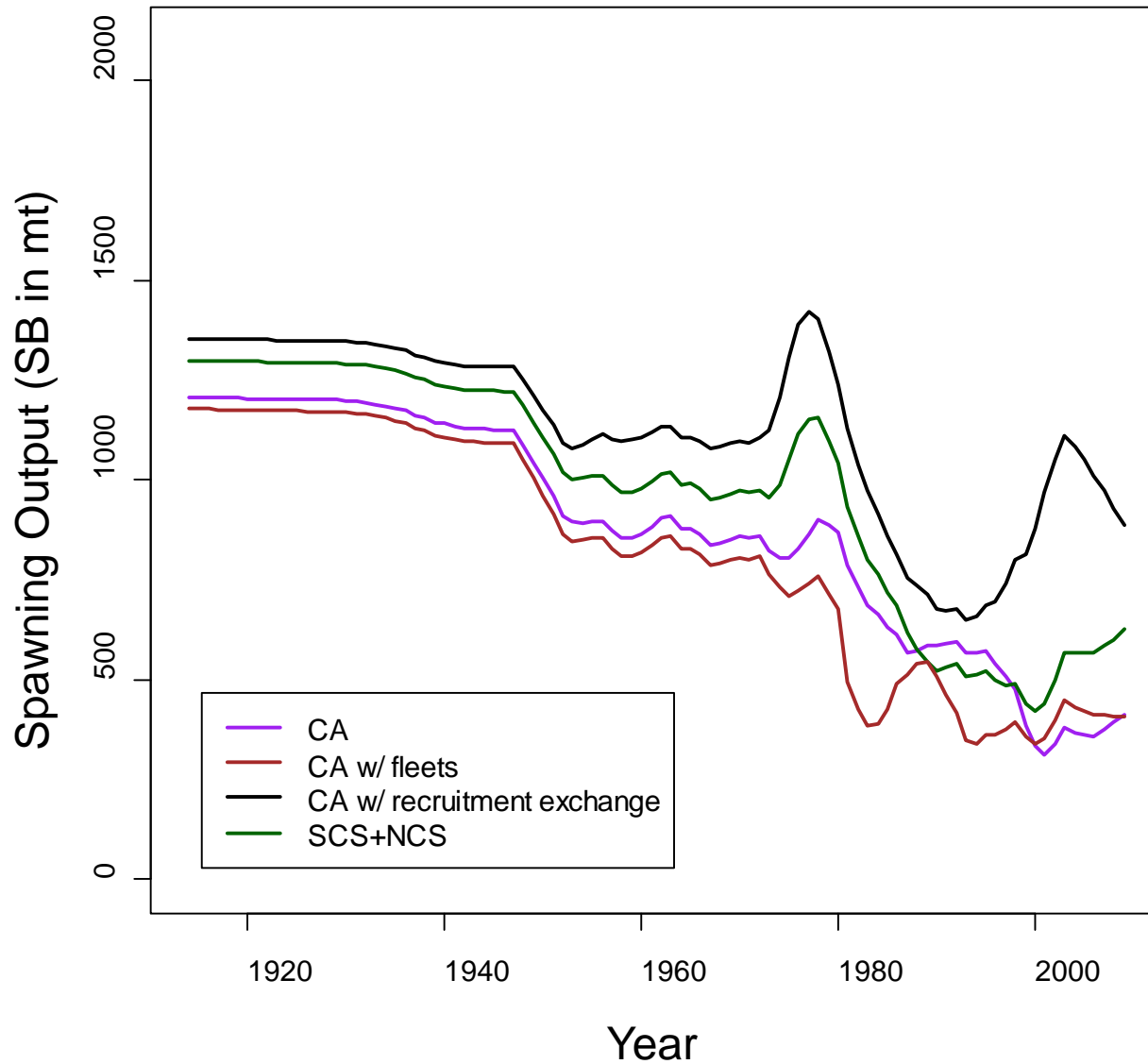
Depletion: 34%

# Stock structure & Recruitment deviations

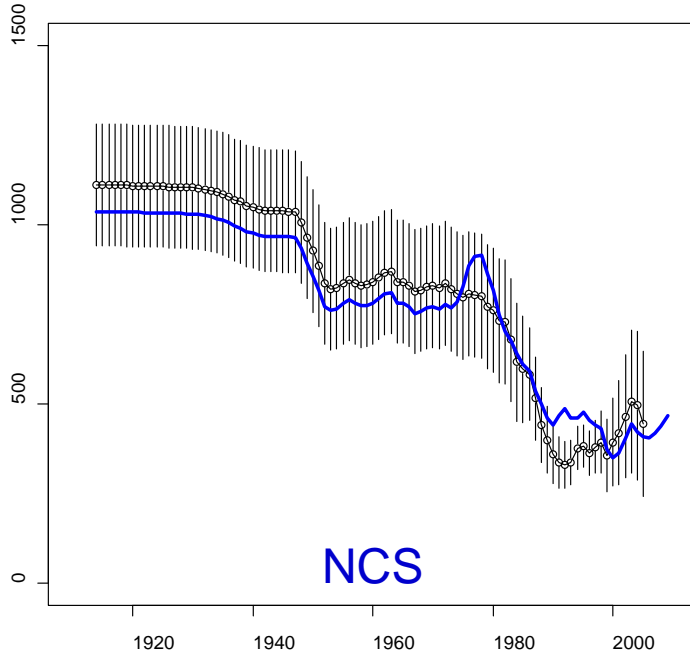
Recruitment deviations

Year

# Treating stock structure



# Assessment comparisons: 2005 vs 2009



NCS

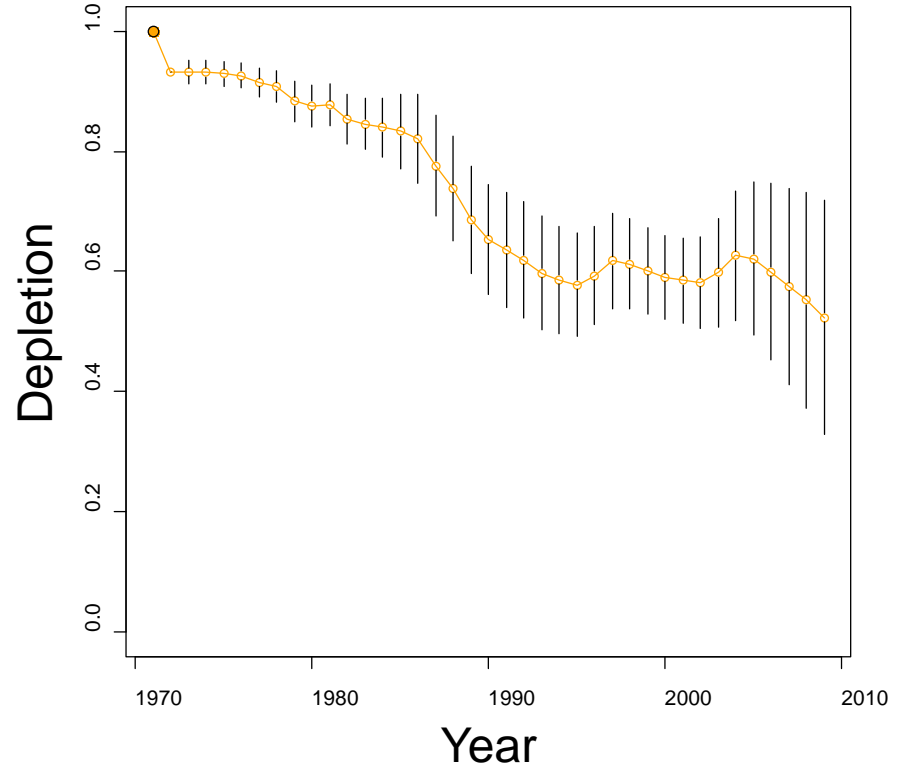
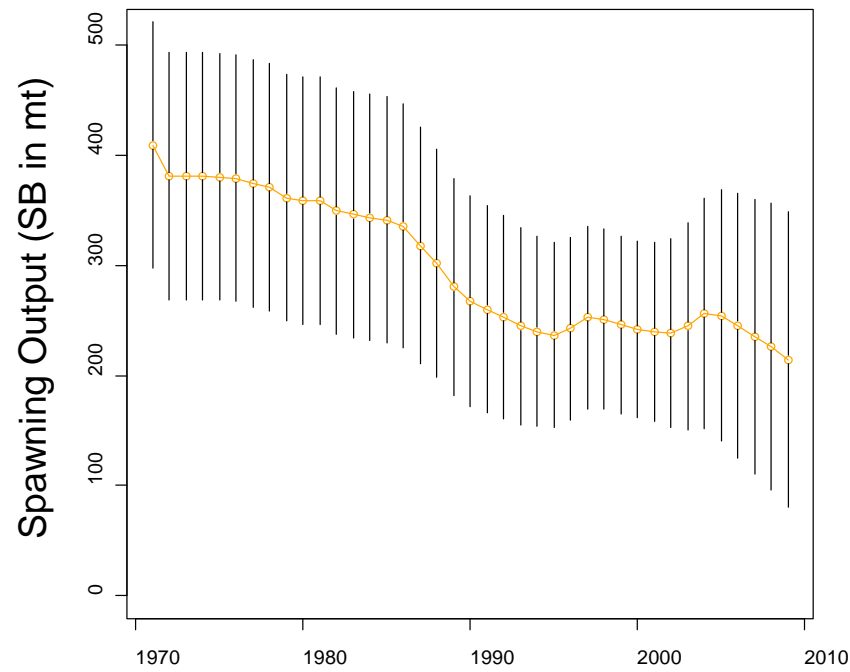
SCS

CA: NCS + SCS

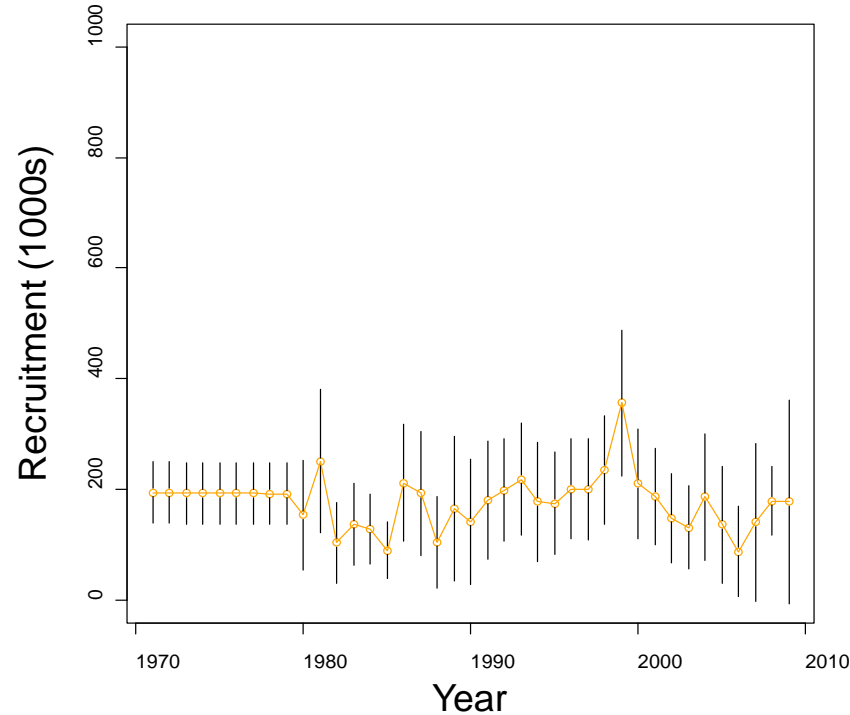
CA: 1 assessment

Year

# Base Case: ORS



Spawning Output (SB in mt)



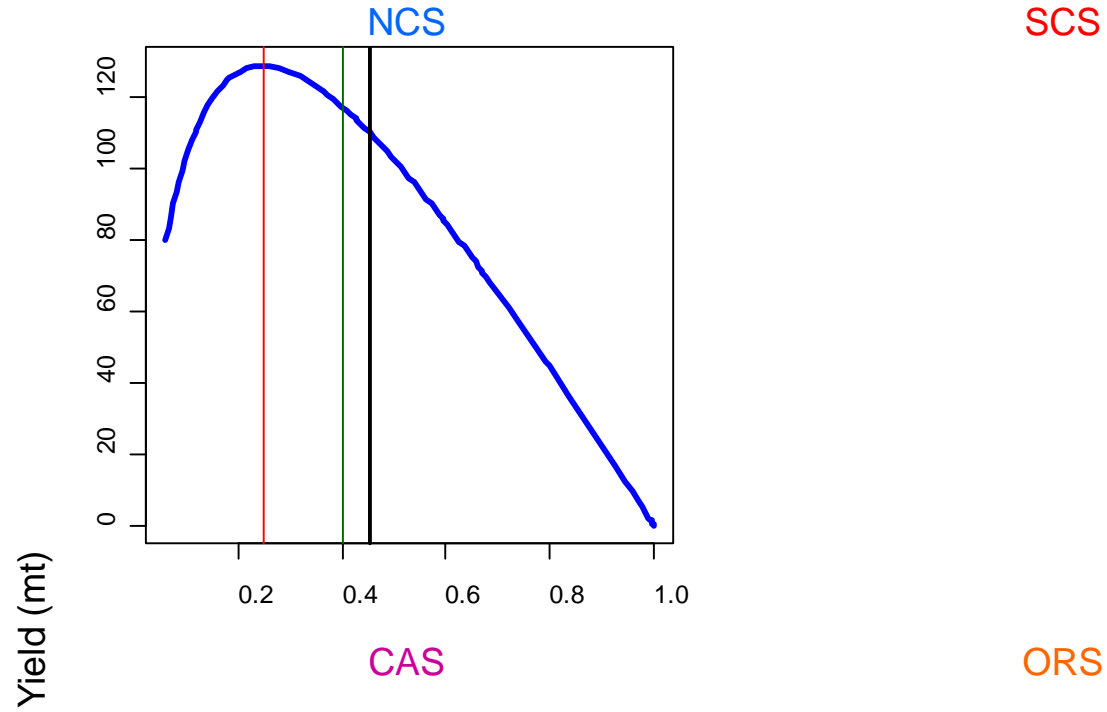
$SB_{1916}$ : 409 mt

$SB_{2009}$ : 214 mt

Depletion: 52%



# Equilibrium curves



Depletion

# Research Recommendations

- Improve estimation
- Age and growth
- Fishery-independent surveys
- Stock structure
- Alternative assessment methods