

Supporting a Spatial Analysis of the Distribution and Size of Rebuilding Stocks in Rockfish Conservation Areas (RCA) Through Directed Fishing and Visual Surveys

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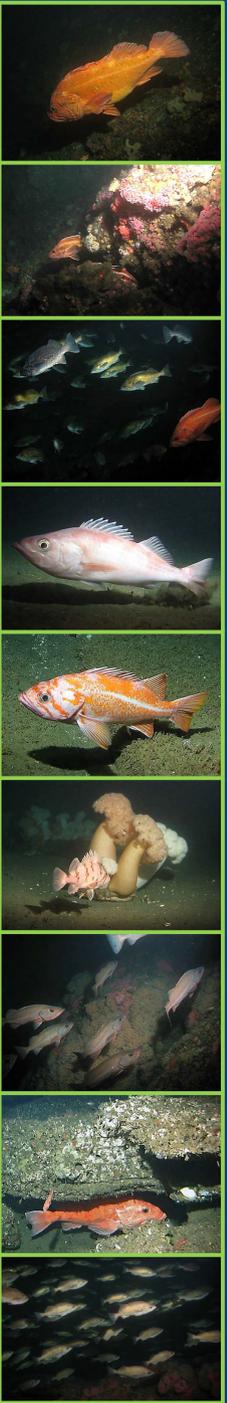
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Objectives

1. Use the combination of existing fisheries independent and dependent data and local knowledge to **develop predictive maps** of the distribution, abundance, and size of overfished groundfish stocks along the entire West Coast. **COMPLETE.**
2. **Ground-truth the predictive maps** by performing scientific sampling (visual surveys and directed fishing) to assess encounter rates with OFS in a subset of locations inside the trawl and non-trawl RCAs in Central California with predicted high, medium, and low density of OFS.
3. **Characterize the abundance, length, and habitat associations of OFS** in those same locations, as well as collect biological samples of OFS for growth and maturity studies.

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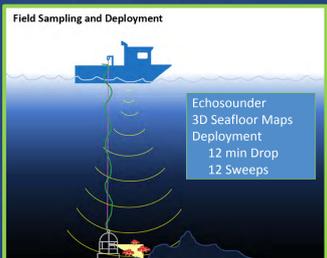
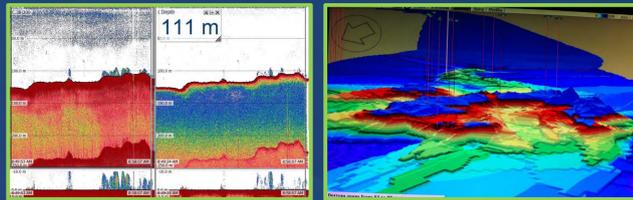


Methods: Predictive mapping → Groundtruth with coordinated visual and fishing surveys

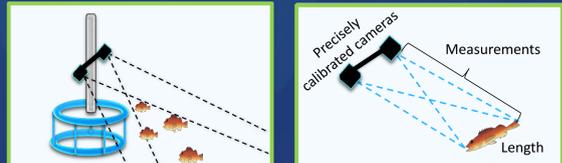
Visual surveys with Stereo Video Lander



Precise positioning in relation to rocky features using GPS, dual frequency echosounder and 3D real-time mapping onboard our collection platform F/V *Donna Kathleen*



Precisely calibrated stereo-imagery allows us to measure fish size with standard errors of < 5% TL producing highly accurate size distributions in areas fished.

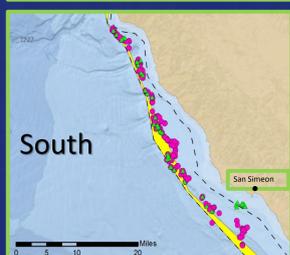
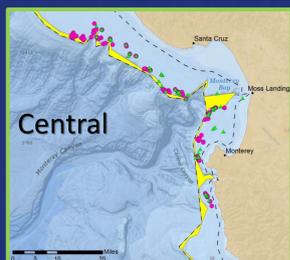
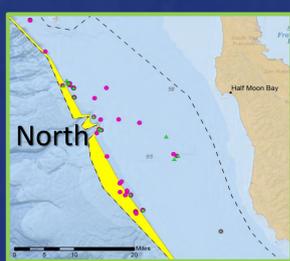
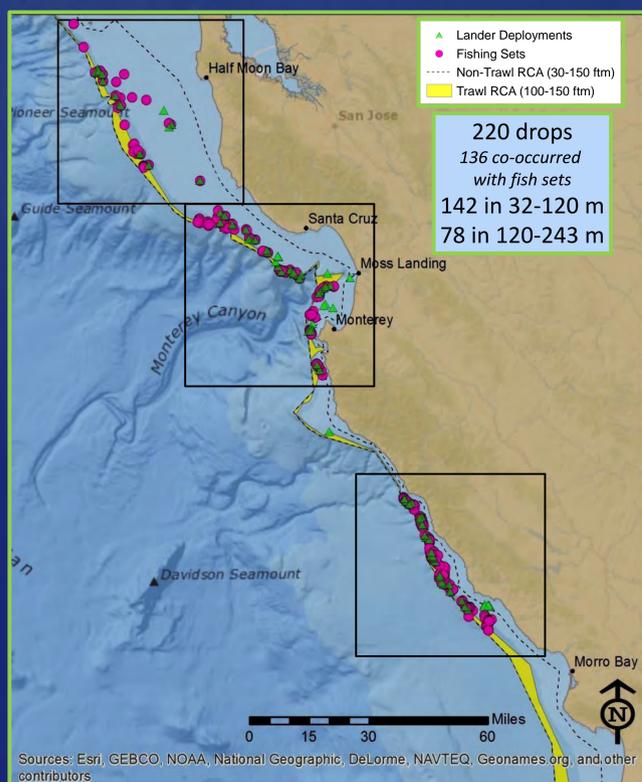


Directed fishing surveys using commercial boats

Snapper reel with 15 hooks, 15-20 min soak
 25 ft. above bottom
 100% observer coverage and strict quota tracking under an Exempted Fishing Permit
 Morphometric and catch data collected onboard
 Rebuilding species retained for NMFS
 Commercial species sold by crew



Results: Central California



Video Lander

30 drops
 21 co-occurred with fish sets
 10 65-120 m
 20 120-243 m

Species observed

Shortbelly, Chilipepper, Greenspotted, Hake, Canary, Vermilion, Yelloweye, Yellowtail, Copper, Greenstriped, Stripetail, Sablefish, Cowcod, Starry, Flag, China, Quillback, Sebastomus, Hagfish, flatfishes

107 drops
 56 co-occurred with fish sets
 80 75-120 m
 27 120-220 m

Species observed

Lingcod, Hagfish, Greenspotted, Canary, Vermilion, Yelloweye, Yellowtail, Widows, Bocaccio, Copper, Greenstriped, Stripetail, Sablefish, Starry, Halfbanded, Sebastomus, Hake, Chilipepper, Pygmies, Squarespotted, flatfishes

83 drops
 59 co-occurred with fish sets
 52 32-120 m
 31 120-240 m

Species observed

Vermilion, Yelloweye, Canary, Bocaccio, Yellowtail, Copper, Greenspotted, Speckled, Widow,, Sablefish, Cowcod, Sebastomus, Ratfish, Shortbellies, Bank, Squarespot, Pygmies, Hagfish, Rosy, Pink Seaperch, Pile Perch, Gopher, Olive, flatfishes

Directed Fishing

65 sets
 *300 fishes,
 401 lbs landed

Species observed

Bocaccio, Canary, Chilipepper, Vermilion, Widow, Yellowtail, Other Rockfishes, Lingcod, Sablefish, Flatfishes

57 sets
 *77 fishes,
 101 lbs landed

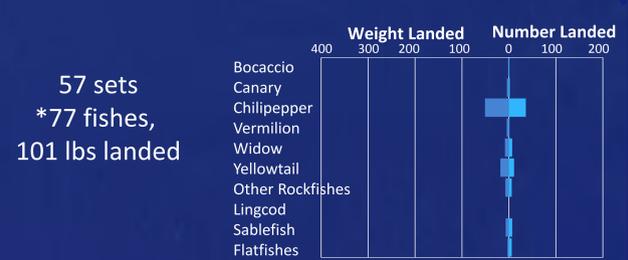
Species observed

Bocaccio, Canary, Chilipepper, Vermilion, Widow, Yellowtail, Other Rockfishes, Lingcod, Sablefish, Flatfishes

236 sets (2 boats)
 *731 fishes,
 3435 lbs landed

Species observed

Bocaccio, Canary, Chilipepper, Vermilion, Widow, Yellowtail, Other Rockfishes, Lingcod, Sablefish, Flatfishes



*includes discards