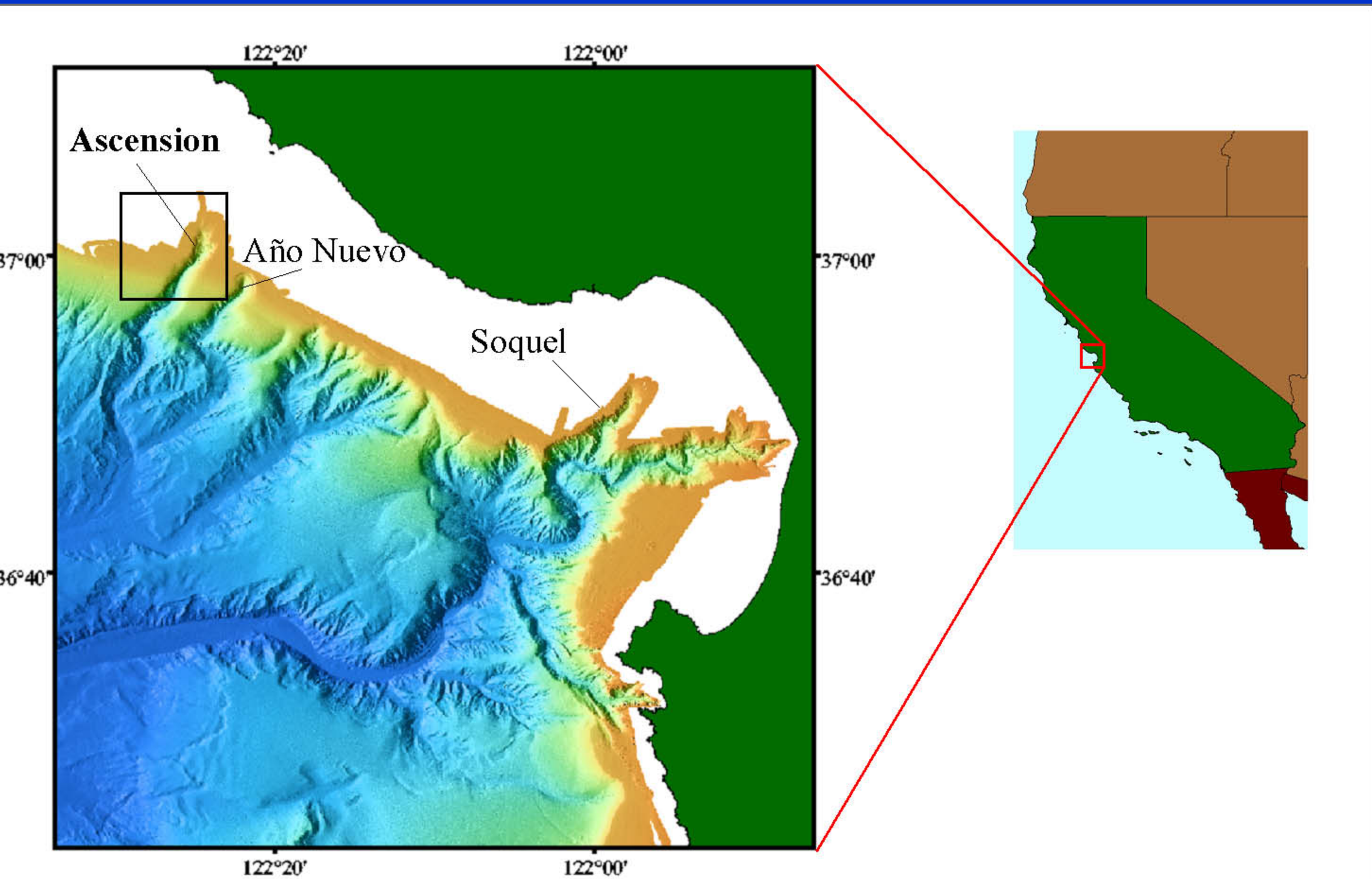


# Habitat Associations of Rockfishes (*Sebastes* spp.) and Other Demersal Fish Species in the Headward Part of Ascension Canyon, CA

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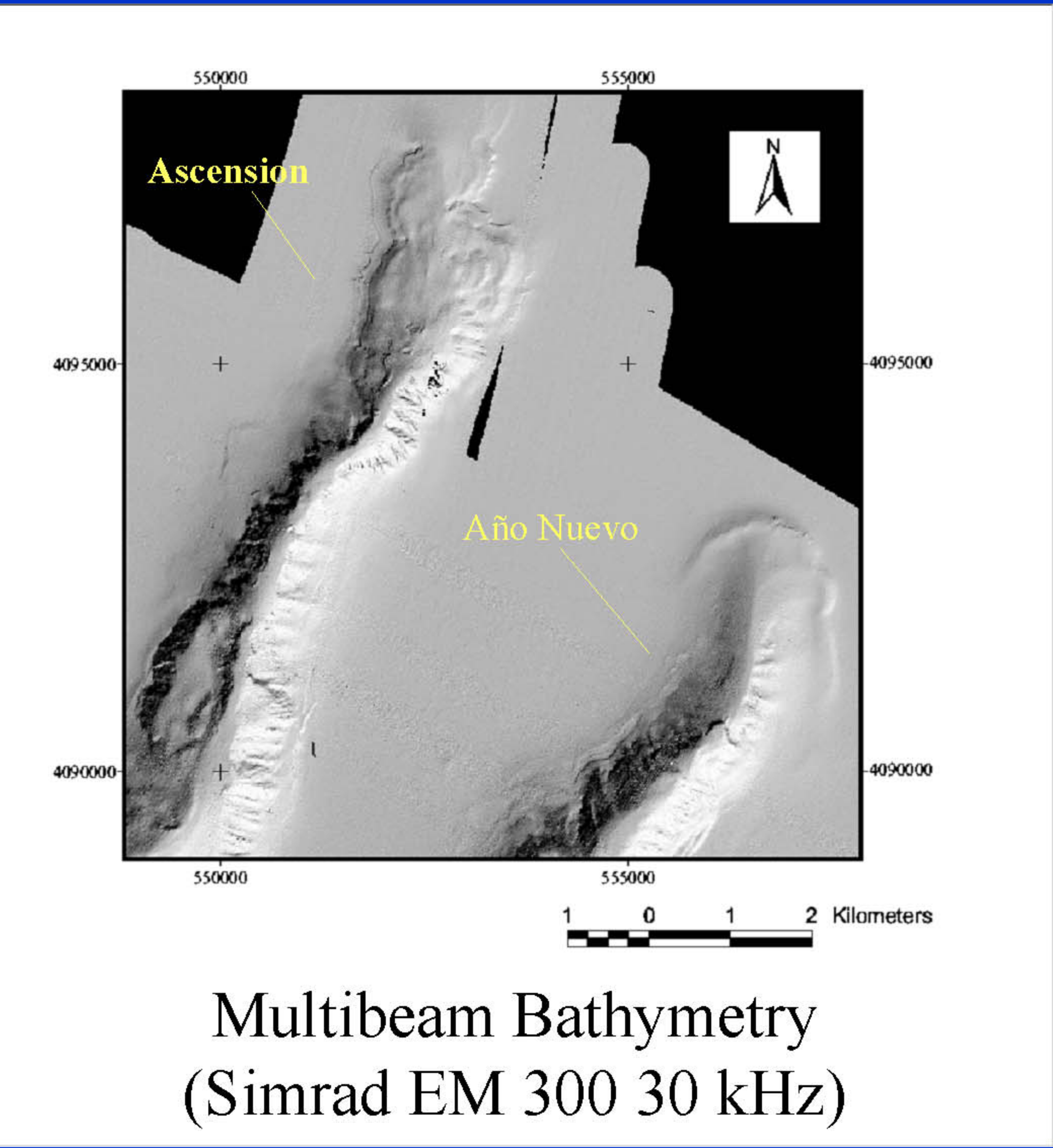
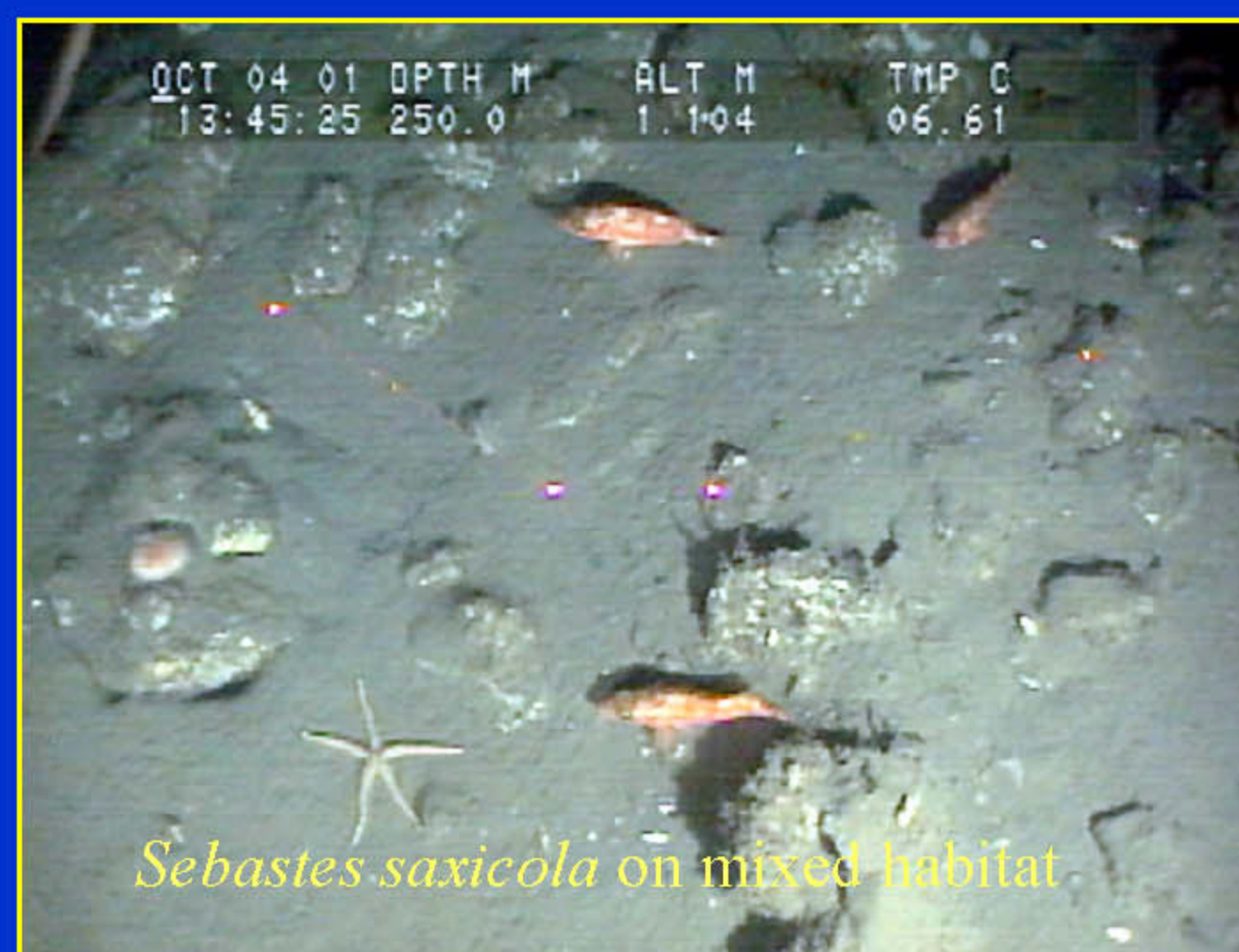
Study Site in Monterey Bay Submarine Canyon System

## Objectives

- 1) Produce detailed habitat maps for the headward parts of Ascension and Año Nuevo Canyons with data interpreted from multibeam bathymetric imagery using a classification scheme modified after Greene *et al.* 1999
- 2) Verify and categorize the meso and macroscale habitat types and describe the relationship between demersal fish assemblages and their available habitats using observations and video transects recorded collected with the *Delta* research submersible
- 3) Analyze the relationship between the dominant fish species and their meso (hundreds of meters) and macroscale (one to tens of meter) habitats using statistical analyses, indices, and descriptive statistics

## Summary Statistics

- Sampled 19,974 m<sup>2</sup> of seafloor comprised of 139 different habitats and recorded 2,839 fishes from 57 taxa and at least 47 species (21 rockfish species)
- ANOVA results indicate significantly higher species diversity along the southern wall of the canyon in association with more heterogeneous habitat at the mesoscale
- Individual species densities were significantly different between depths (*Sebastes elongatus* and *Sebastes alascanus*), macroscale habitats (*Sebastes saxicola*), and among both depths and macroscale habitats (*Microstomus pacificus*)



Multibeam Bathymetry (Simrad EM 300 30 kHz)

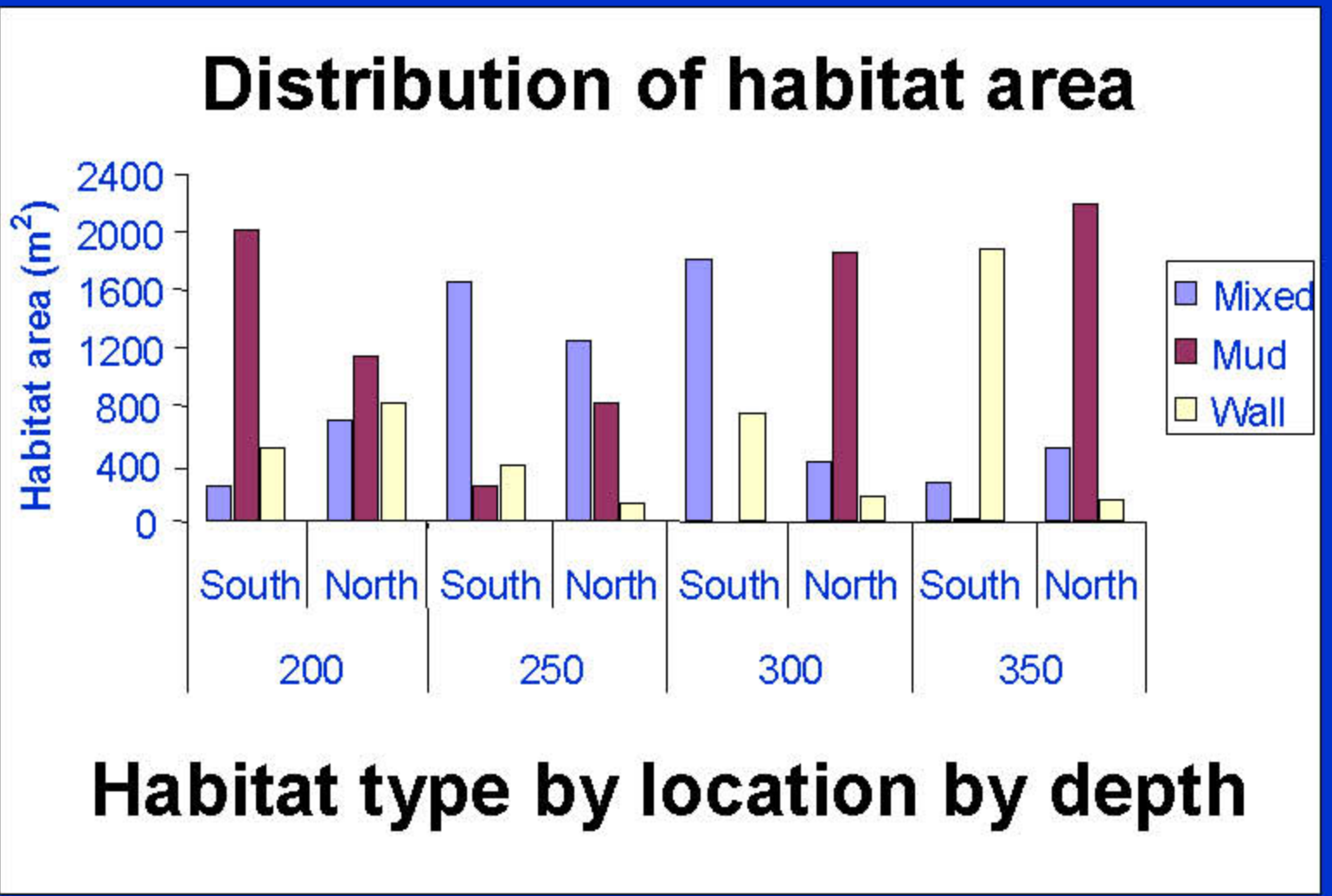
200 meters			250 meters			
Species	#	Rank	Species	#	Rank	
<i>Sebastes saxicola</i>	326	40.35	1	448	82.22	1
<i>Sebastes elongatus</i>	112	13.86	2	30	4.17	2
<i>Sebastes spp.</i>	82	10.15	3	23	3.19	3
<i>Pleuronectiformes</i>	37	4.58	4	21	2.92	4
<i>Agonidae</i>	34	4.21	5	18	2.50	5

300 meters			350 meters			
Species	#	Rank	Species	#	Rank	
<i>Pleuronectiformes</i>	106	18.40	1	128	17.39	1
<i>Glyptocephalus zachirus</i>	64	11.11	2	107	14.54	2
<i>Lycodes pacificus</i>	55	9.55	3	87	11.82	3
<i>Sebastes tufus</i>	44	7.64	4	77	10.46	4
<i>Microstomus pacificus</i>	42	7.29	5	52	7.07	5

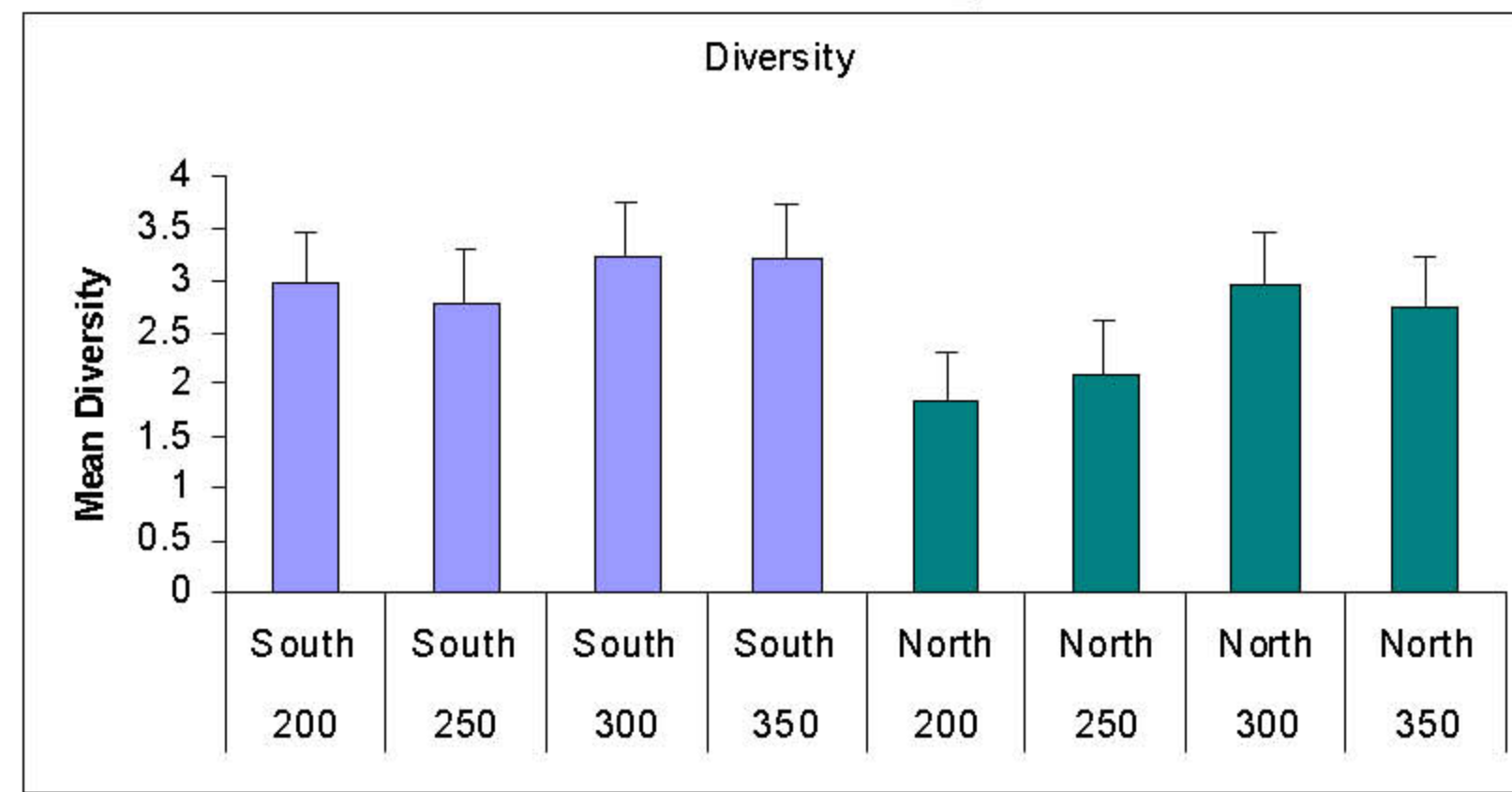
A Bundance, percent frequency of occurrence and rank of the five most dominant fish species at four different depth zones

Abundance, percent frequency of occurrence and rank of the five most dominant fish species at four different depth zones



Habitat type by location by depth

## Mesoscale Comparison



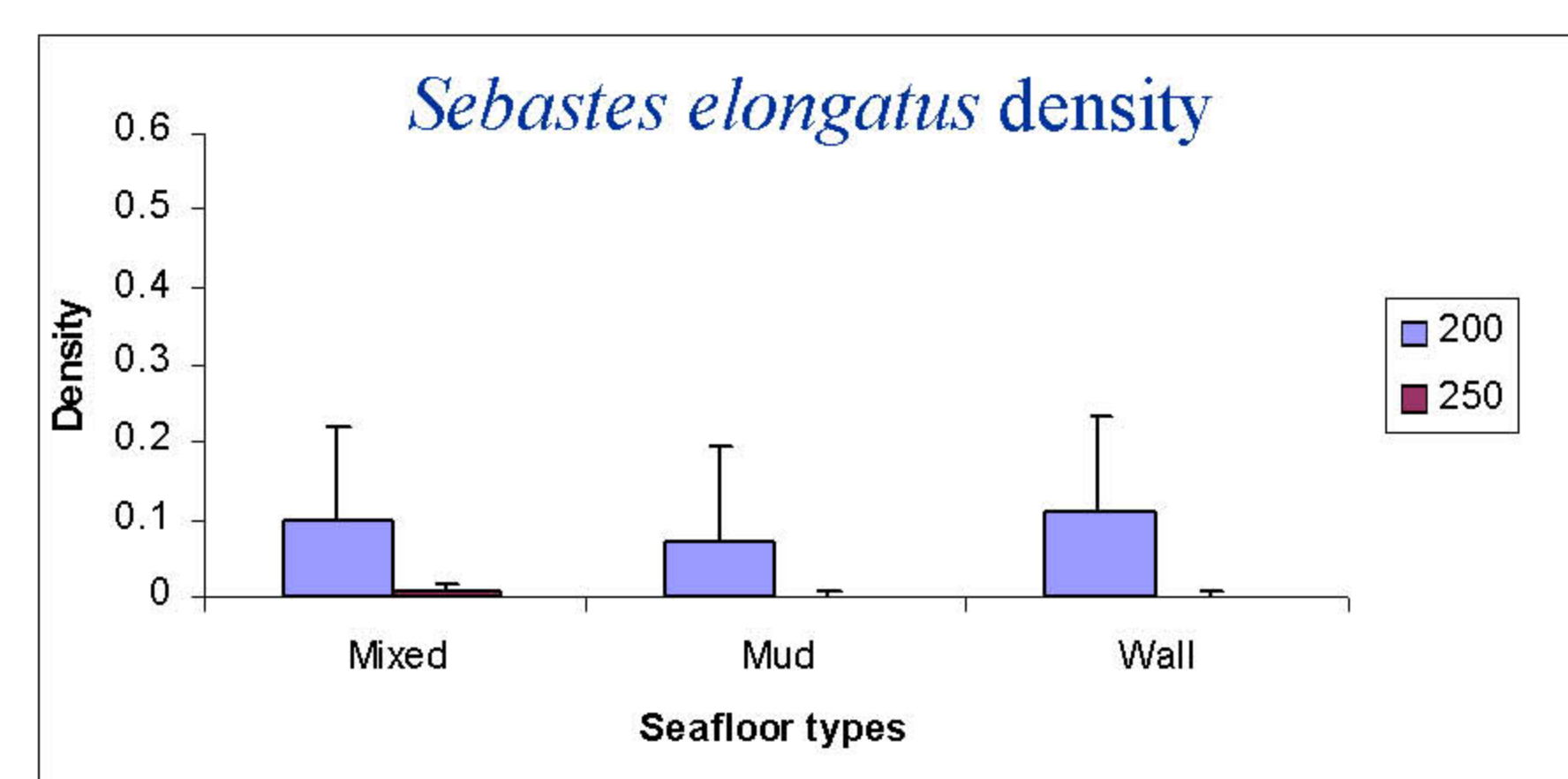
- Diversity was significantly higher in the South (p=0.001)
- Diversity was significantly higher at 300 and 350 meters (p=0.008)

## Conclusions

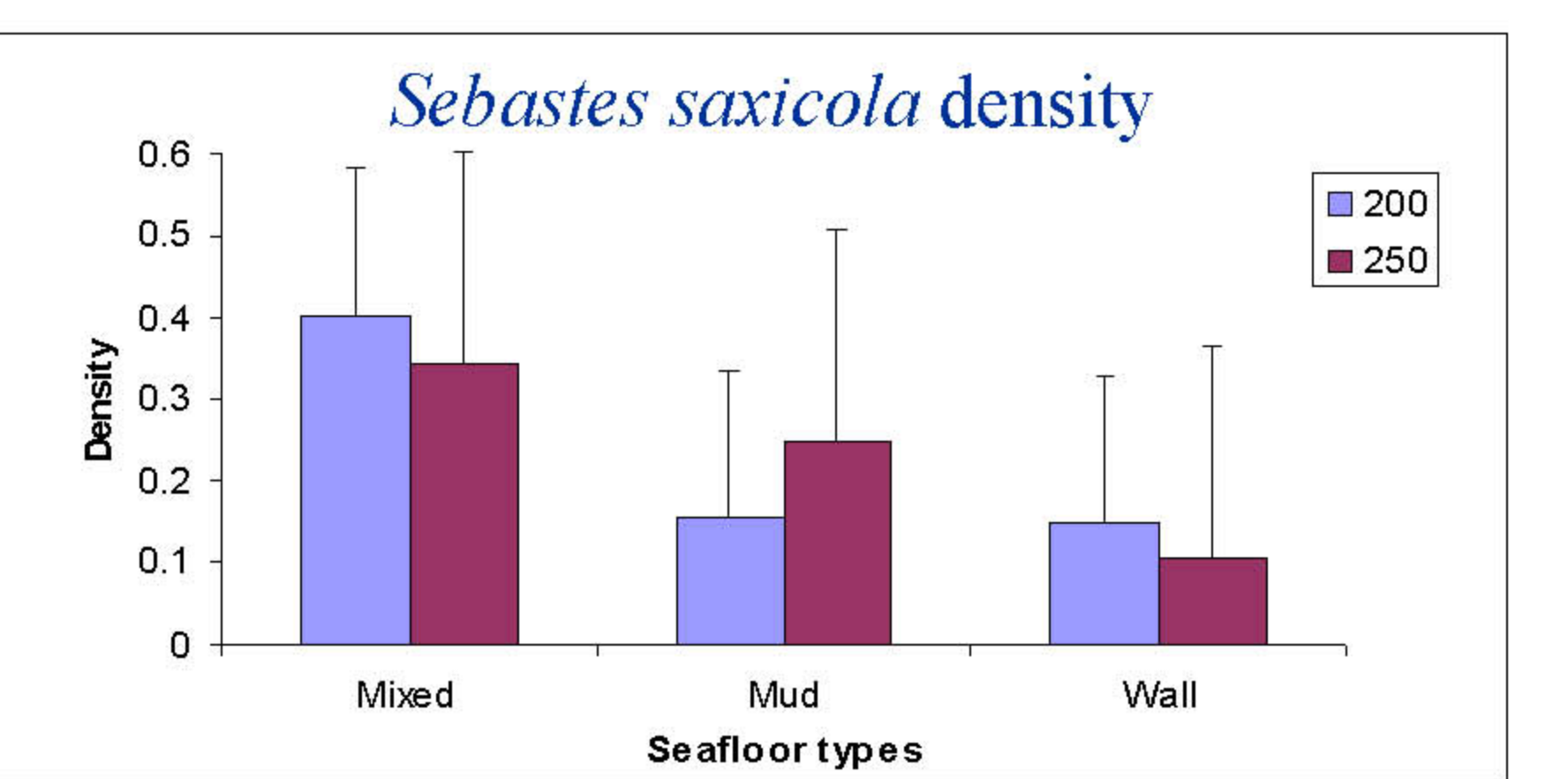
- 1) Habitat distribution and species abundance often varies with depth. Therefore, future reserve designation should incorporate both appropriate habitat and depth ranges for species of interest.
- 2) Remote sensing may not detect unique habitat features at appropriate scales, groundtruthing is required.
- 3) The current fish fauna of Ascension Canyon has likely been greatly influenced by commercial fishing and does appear to provide natural refugia for rockfishes.

## Observations and Notes

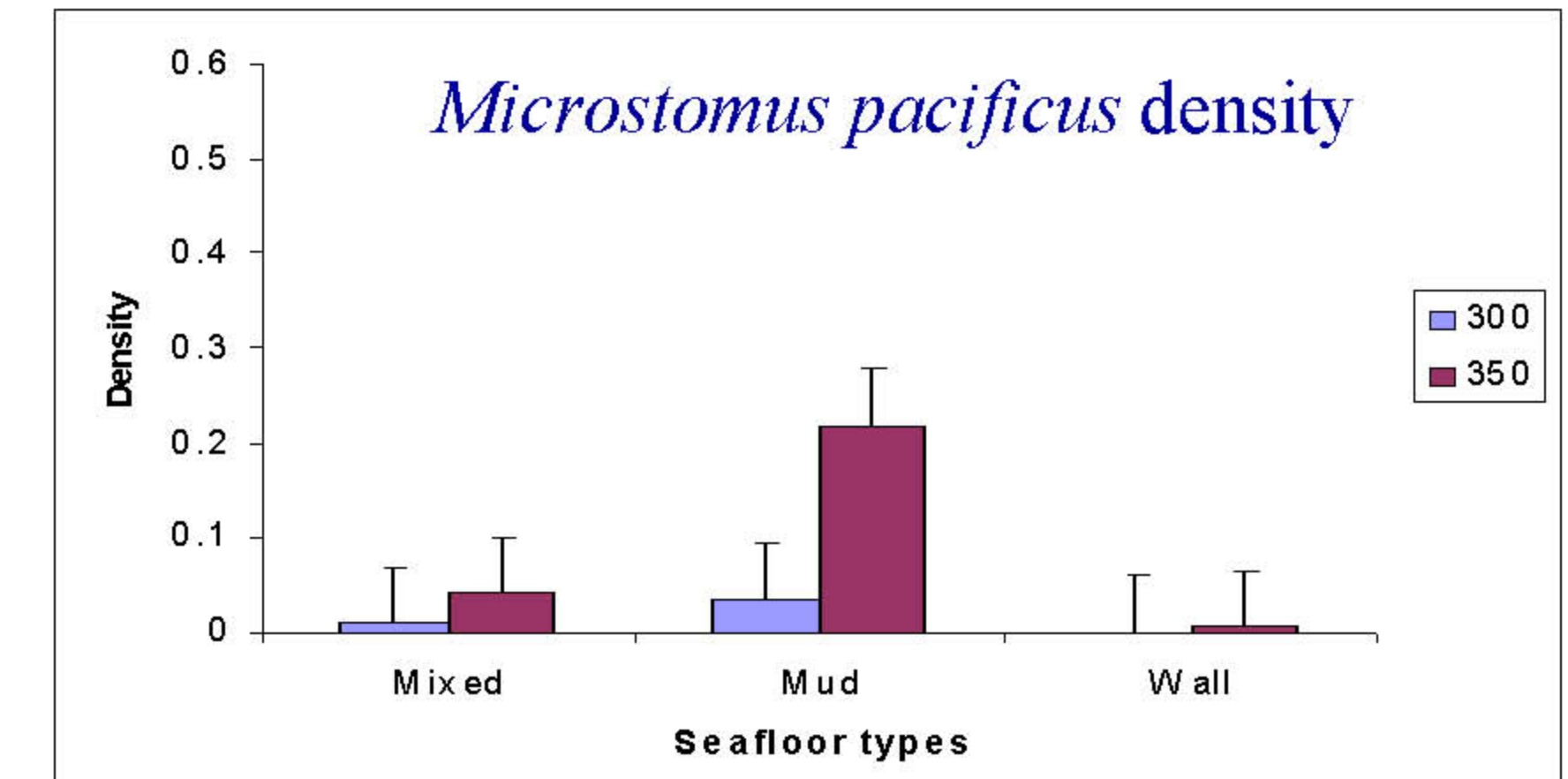
- 1) Possible mating aggregations of filetail catsharks (*Parmaturus xanthurus*) and longnose skates (*Raja rhina*) observed
- 2) 21 dogfaced witchheels (*Facciolella equatorialis*) observed
- 3) Deepsea sole (*Embassichthyes bathybius*) noted almost exclusively in association with rock walls



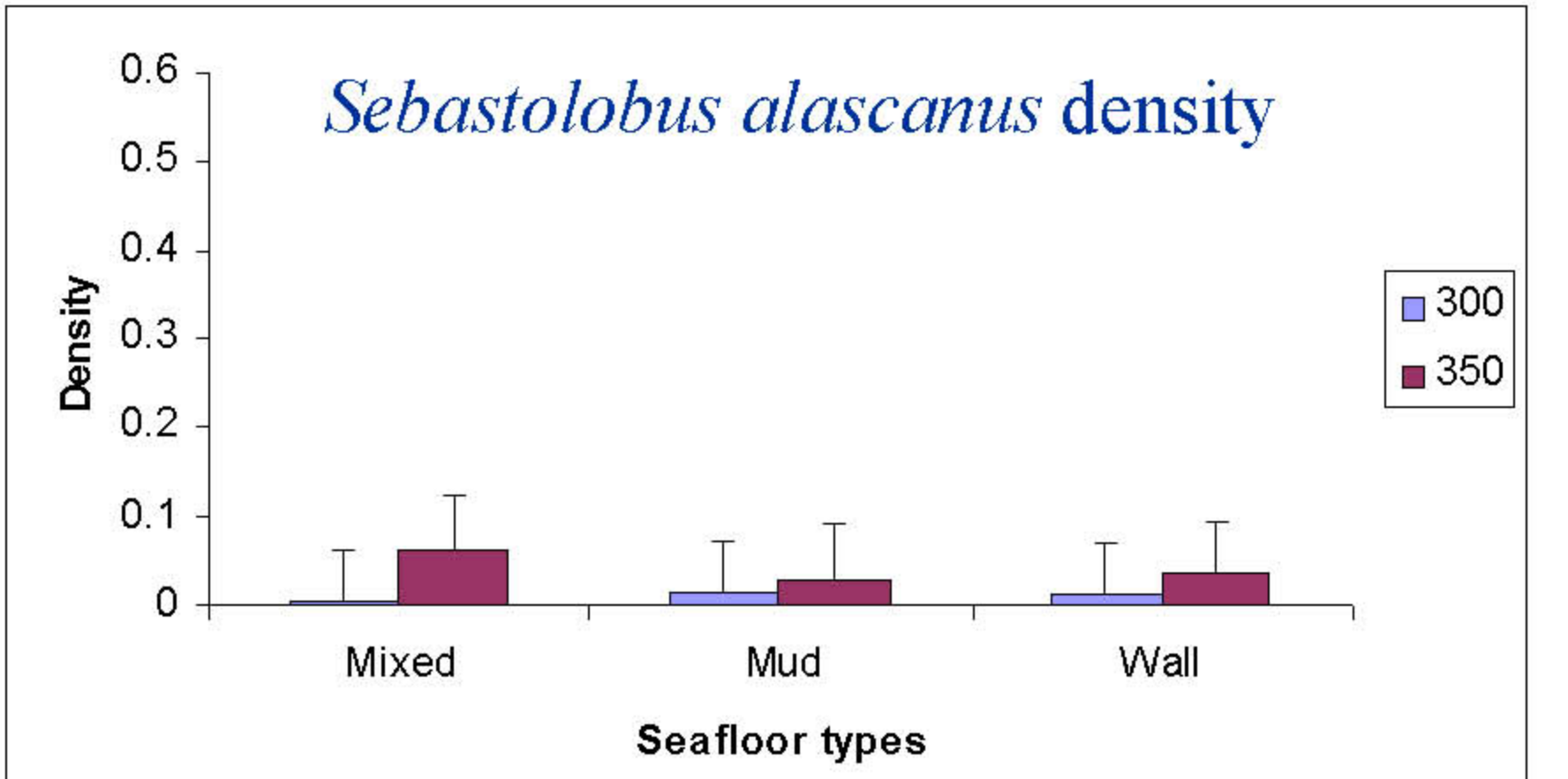
- Densities were significantly higher among depths (p=0.000)
- Densities were not significantly different among habitats (p=0.731)



- Densities were significantly higher among habitats (p=0.012)
- Densities were not significantly different among depths (p=0.946)



- Densities were significantly higher among habitats (p=0.000) and among depths (p=0.000)
- There was a significant interaction among habitats and depth (p=0.000)



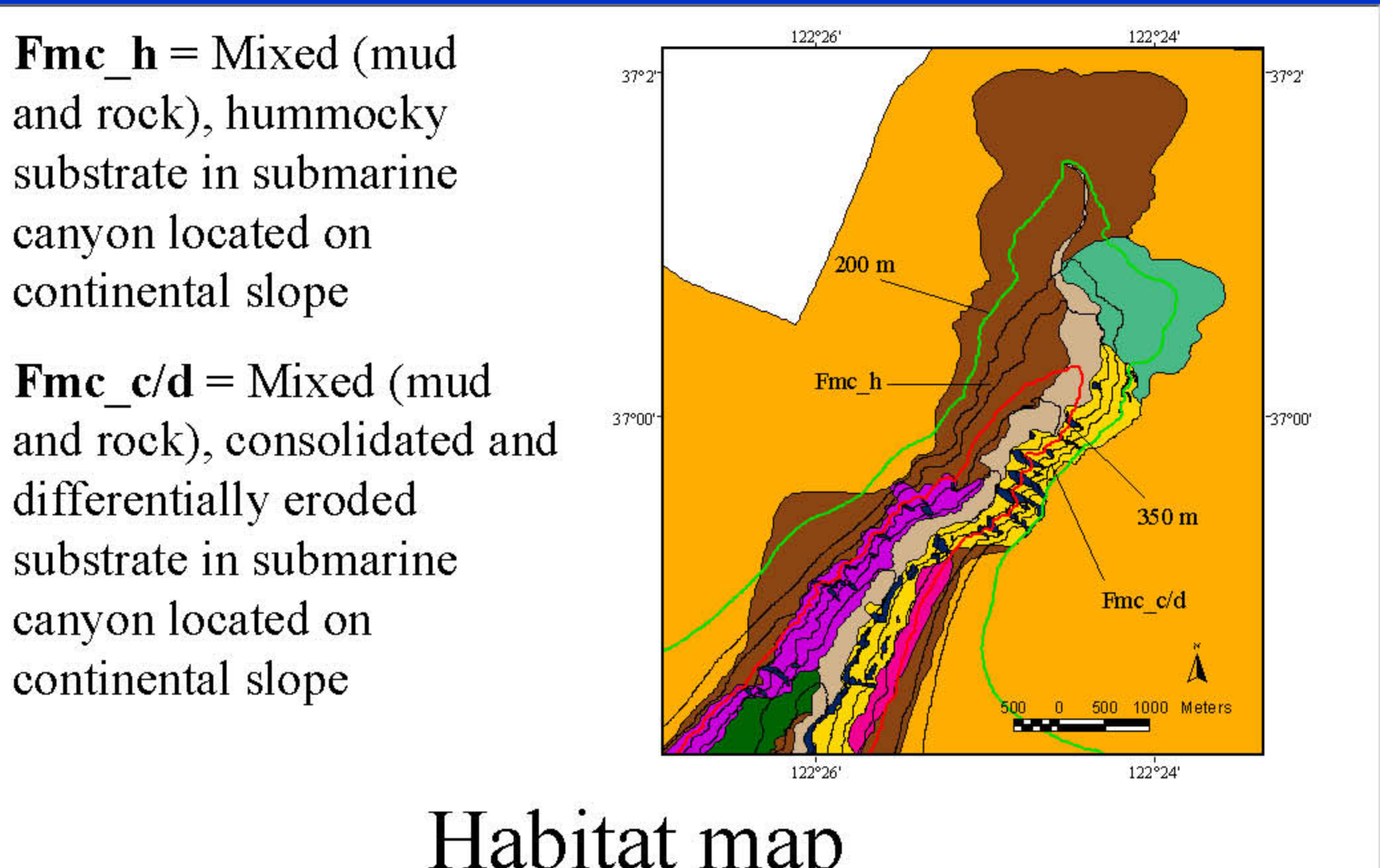
- Densities were significantly higher among depths (p=0.006)
- Densities were not significantly different among habitats (p=0.663)

## Further Research

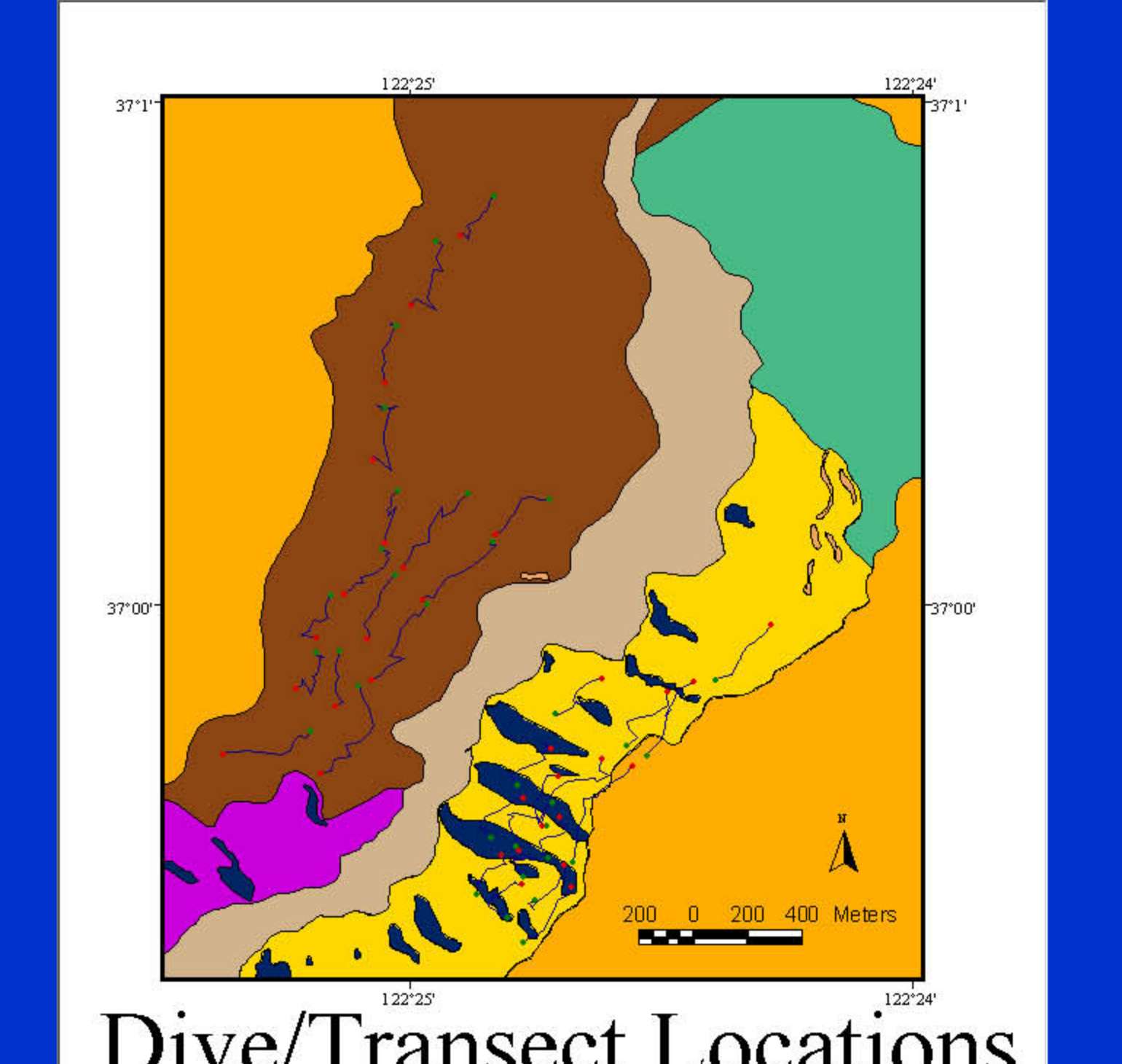
- 1) Adjust habitat interpretations and complete detailed habitat maps for Ascension and Año Nuevo Canyons
- 2) Complete analysis for all transects (50 total among 13 fish dives) in Ascension and Año Nuevo Canyons and compare results
- 3) Incorporate ROV data from November 5-9, 2001 MBARI cruise and additional ROV data from previous dives

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Habitat map



Dive/Transect Locations