SURVEYS OF NON-INDIGENOUS SPECIES IN THE COASTAL WATERS OF CALIFORNIA

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Purpose

- Ballast Water Act of 1999 Directed DFG to Conduct Biological Surveys to Identify Non-indigenous Species (NIS)

Questions:

1. Which NIS have arrived in California via Ballast Water?
2. Is the rate of new introductions increasing or not?

- Initial Study Directed at Inshore Marine and Estuarine Waters of the State and was Designed to Develop a NIS Baseline for a Statewide Database

- Initial Survey Focused on 7 Primary Ports and Estuaries where Ballast Water is Most Likely Discharged

- Field Sampling Conducted at All Sites
  - Except San Francisco Bay
    - Study by Cohen and Carlton (1995)

Primary Sites

- At Each Primary Site, Four Biological Communities were Examined:
  - Fouling community
  - Soft bottom infaunal community
  - Nekton
  - Plankton (quarterly)

- Investigation combined Field Sampling and Literature Review

15 Secondary Sampling Sites – to examine distribution of NIS by other non-ballast water mechanisms

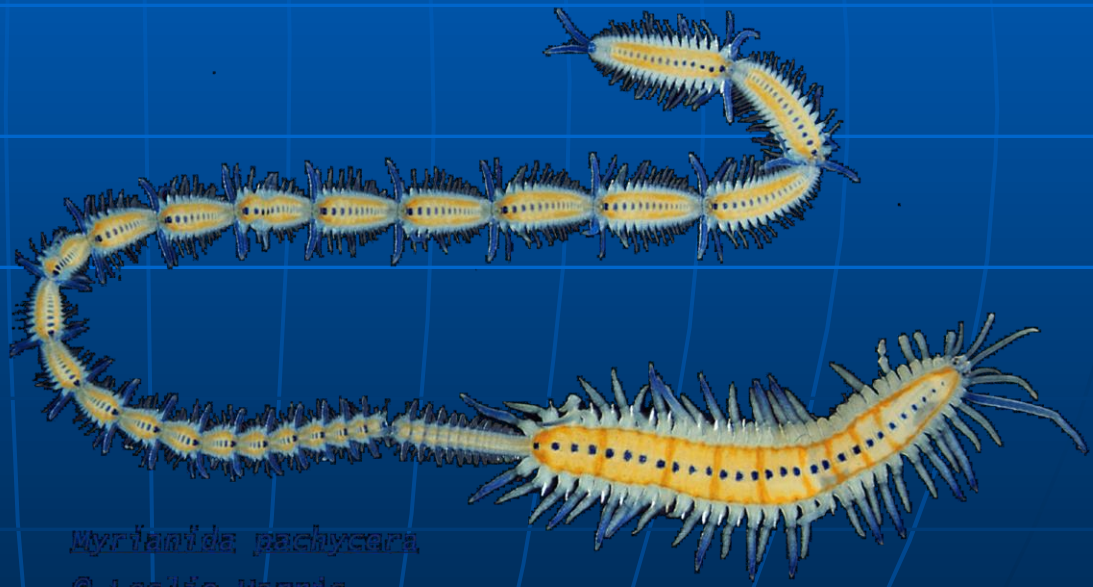
- Smaller bays, harbors, and estuaries

- Investigation Supplemented by Several other Studies of S. Cal. Bays and Harbors

Secondary Sites

Three Groups of Species

- Non-indigenous
- Cryptogenic
- Unresolved



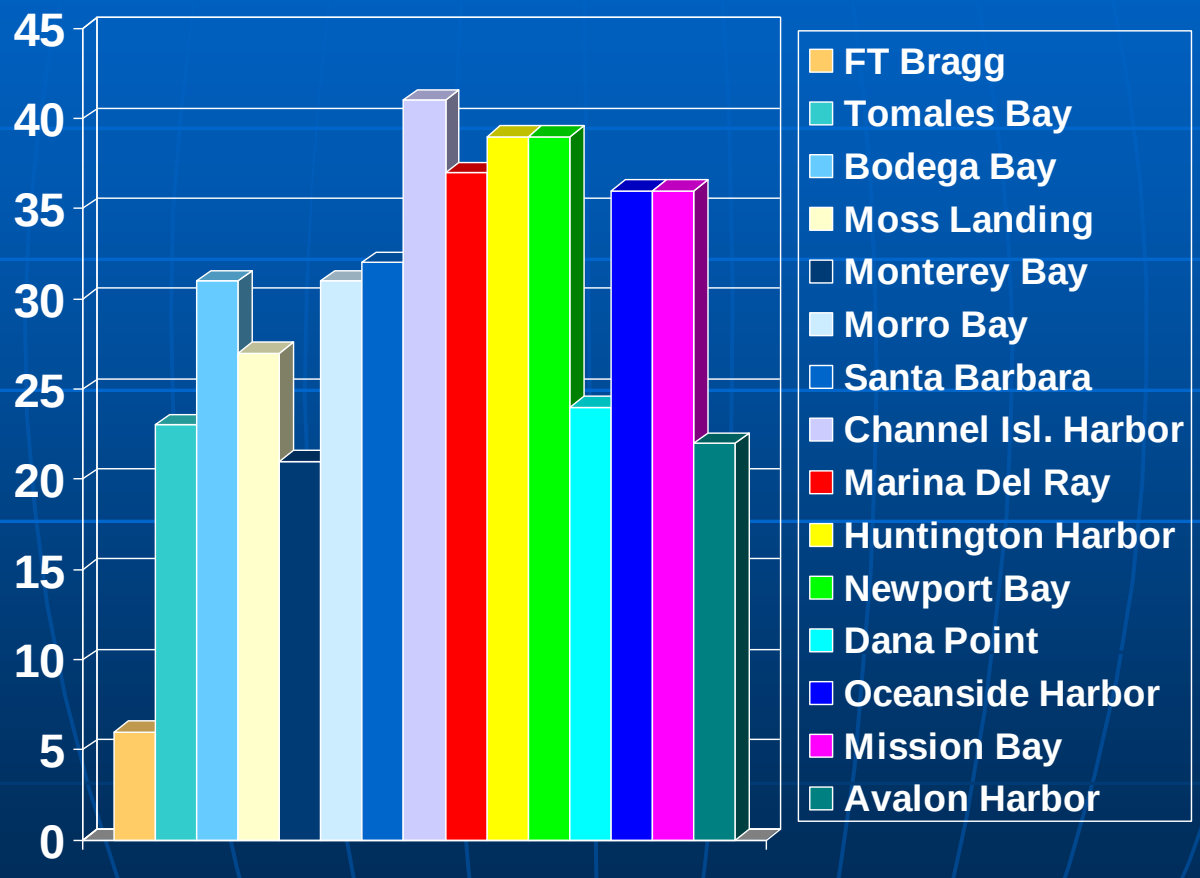
Statewide Results

- 378 NIS species
  245 Cryptogenic species identified from literature and field surveys
- Dominant Groups Include Annelids and Crustaceans
- Most Common Mechanisms of Introduction Included Fouling, Ballast Water, and Aquaculture

Number of Species Identified from Primary Sites

PRIMARY SITE	NIS SPECIES	CRYPTOGENIC SPECIES
Humboldt Bay	76	37
San Francisco Bay	180	47
Inland Ports	16	11
Port Hueneme	54	61
LA/LB Harbor	77	70
San Diego Bay	51	26

NIS + Cryptogenic Species Collected at Secondary Sites



Marine Invasive Species Act of 2003

- Directed DFG to Develop NIS Baseline for Open Coast Region of the State
- Revisit Bay and Estuary Locations
- Revisit Open Coast Locations

Open Coast Sampling Program

- 22 Sites Sampled Along the Outer Coast
  - Mexico to Oregon Border
- Rocky and Sandy Intertidal and Subtidal Stations Sampled
- Total of 31 NIS and 194 Cryptogenic Species Collected Along the Open Coast
  - Most common NIS were Bryozoans (9) and Arthropods (7)
  - 558 unresolved taxa collected

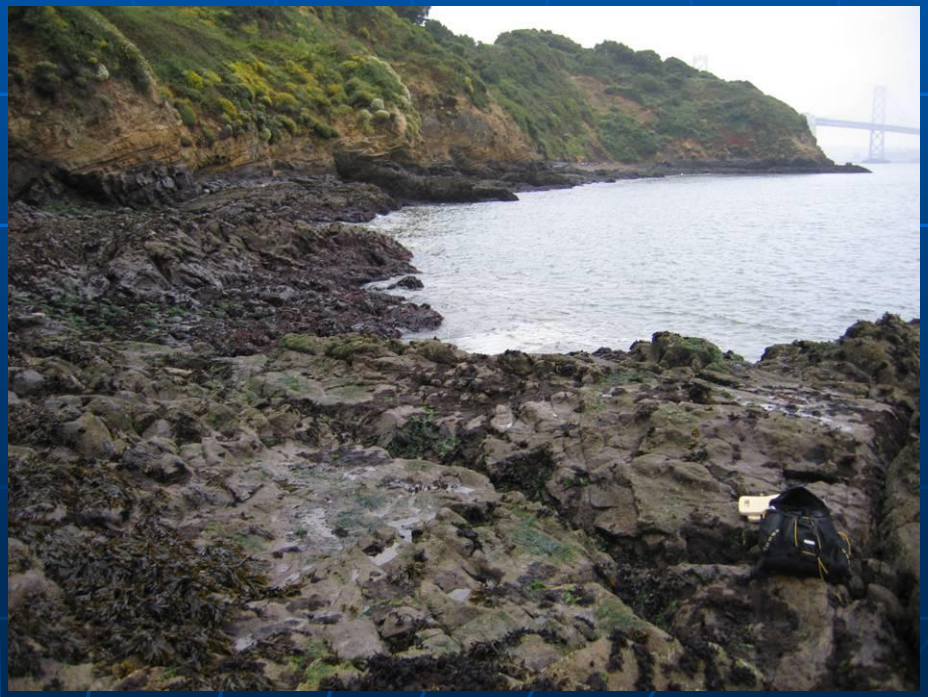
- Initial Sampling Completed in 2005. Follow-up Sampling to Begin in 2007

Open Coast Sampling Sites

Monitoring Program

Return to all Sites Previously Sampled

- San Francisco Bay
  - Field Sampling Completed in 2005
  - 120 Sites Sampled
    - Rocky Intertidal Sites
    - Sandy Intertidal Sites
    - Fouling Community Sites
    - Benthic Soft Bottom Sites
- All Remaining Harbors and Bays
  - Sampling now
  - 6 Remaining Primary Sites
  - 15 Secondary Sites



- Data From All Surveys can be found on the Department of Fish and Game Office of Spill Prevention and Response Web Site

- WWW.DFG.CA.GOV/OSPR
  - Link to “Invasive Species”

- New Legislation , Senate Bill 497

  = Coastal Ecosystem Protection Act

  - Passed in 2006
  - Extends NIS monitoring

Questions ?

WWW.DFG.CA.GOV/OSPR

Link to “Invasive Species”