North Coast MPA Baseline Monitoring: Rocky Intertidal
North Coast MPA Baseline Monitoring Symposium
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This chart does not replace the legal description found in Title 14, California Code of Regulations.
Project components

- Focal species
  - sea stars (and wasting syndrome)
  - mussel beds
  - abalone (*Haliotis* spp.)
  - sea palm (*Postelsia palmaeformis*)
  - surf grass (*Phyllospadix* spp.)

- Fish diversity surveys

- Algae & invertebrate biodiversity surveys

- High-resolution topographic surveys
Project components

• Focal species
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• Fish diversity surveys

• Algae & invertebrate biodiversity surveys

• High-resolution topographic surveys
Methods: *Pisaster ochraceus*

- MARINe (Multi-Agency Rocky Intertidal Network)
- Permanently-marked irregular plots in mid/low zone
- Roughly 15–30m²
- 3 plots per site
- Data:
  - Counts by arm length (1cm bins) and wasting category
    (0 = healthy/no wasting, 4 = disintegrating)
Methods: mussel bed

• MARINe (Multi-Agency Rocky Intertidal Network)
• Permanently-marked photo quadrats in mussel bed (mid zone)
• 50cm × 75cm = 0.375m²
• 5 quadrats per site
• Data:
  – Percent cover (100 contact points/quad)
  – Mussel bed depth (5/quad = 25/site)
  – Individual mussel length (10/quad = 50/site)
Abalobadia (10 Mi. SMR)

MacKerricher SMCA

[Bar charts showing disease class and ray length for ABD and MAC from summer and winter of different years.]
**Pisaster** trends by site

**Healthy ≥ 60mm**

<table>
<thead>
<tr>
<th>Site</th>
<th>Sum 14</th>
<th>Win 14/15</th>
<th>Sum 15</th>
<th>Win 15/16</th>
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**Juveniles < 60mm**

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<th>Sum 15</th>
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**Pisaster trends by site (wasting)**

![Graph showing Wasting symptom prevalence]

- Fraction symptomatic
- Wasting symptom prevalence
- Sum 14, Win 14/15, Sum 15, Win 15/16

Legend:
- PYR
- PSG
- PAP
- ABD
- MAC
- FTB
- BLN
Mussels

![Graphs showing percent cover, bed depth, and mean length of mussels over different periods.]

- Percent cover (% Cover)
- Bed depth (mm)
- Mean length (mm)

Periods: Sum 14, Win 14/15, Sum 15, Win 15/16
Lines represent different species:
- PYR
- PSG
- PAP
- ABD
- MAC
- FTB
- BLN
Observed patterns

- Many more *Pisaster* at northern sites in summer 2014.
- **Major declines in abundance of large *Pisaster***.
- Wasting syndrome prevalence has decreased.
- **Pulse of juvenile *Pisaster* at two sites, especially in the north.**
- Little trend in mussel abundance; no obvious response to decrease in sea stars.
Recognize these?
Recognize these?
Large abalone – in the *intertidal* ?!!
Abalone sizes
Abalone accessibility
Abalone size & accessibility

![Bar chart showing size class and accessibility comparison between 2014 and 2015. Bars represent accessible (white) and not accessible (gray) abalone in different size classes.]
Sampling timeline

- Summer Sampling
- Winter Sampling
- Winter Sampling
- Summer Sampling

2014
2015
2016
Collecting intertidal fish

Tidepool + Water pump + People = Fish!
Diversity results

• High diversity overall: 34 species, 8 families
  – Sculpins (Cottidae) most common
  – Many juveniles of recreational fished species
• Marine protected area sites (MPA’s) have similar diversity, but lower species richness
• And lower abundance at MPA sites
• High intertidal zone had lower species richness but similar abundance (vs. mid and low zone pools)
Richness by zone

Species

Unprotected
Protected

High
Mid
Low
Rockfish

• Typically *Sebastes melanops* recruit March-August

• **Previous studies found hundreds per pool**
  – Rebecca Studebaker & Tim Mulligan (2008)
  – Mark Lomeli (2009)

• **But almost none seen in this study!**
Rockfish

- Sebastes melanops
- Sebastes mystinus
- Sebastes miniatus
- Sebastes spp.

The chart shows the number of juvenile S. melanops captured at Point St. George and Palmer's Point from 2003 to 2015. The data indicates a peak in 2004 at Palmer's Point, with no captures recorded in 2014 and 2015.
Conclusions

• Lots of sculpin recruits in high intertidal zone
• Nearly all likely species were detected
• MPA sites started with lower species richness & abundance
• Why were there no black rockfish?
  – Poor recruitment years?
  – Anomalous (warm) ocean conditions during 2014, 2015?

Oligocottus rimensis

Kevin Hinterman
Acknowledgements

**HSU Intertidal Crew**
- Leslie Booher
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- Kevin Hinterman
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- Allison Mitchell
- Torre Polizzi
- Johnny Roche
- Jaclyn Schneider
- Shelby Shapiro
- Sarah Wickman
- Jana Litt

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- Tim Mulligan
- Anthony Desch

**Funders & Partners**
- California Ocean Protection Council
- Ocean Science Trust & MPA Monitoring Enterprise
- California Department of Wildlife
- California Sea Grant
### Summary values by site

<table>
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<th>Site</th>
<th>Species</th>
<th>Families</th>
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