A Rapid Assessment of Sea Star Populations after the Onset of Wasting Syndrome in California

Sarah Sampson, Corianna Hume-Flannery, Emily Tucker, Hannah Perlkin, Tristin McHugh, Colin Gaylord, Pete Raimondi, and Mark Carr
University of California, Santa Cruz

PURPOSE

Goal: to survey sea star populations after the onset of wasting syndrome on the Pacific Coast of the United States

Study Systems: rocky intertidal and subtidal reef throughout California

Objectives:
1. Determine if wasting is present
2. Determine intensity of wasting
3. Compare current sea star densities to previous densities from PISCO/MARINe intertidal and subtidal datasets
4. Map the outbreak of wasting both spatially and temporally to provide insight into the spread of wasting syndrome

SURVEY SITES

To compare to long term data sets, sites were chosen based on previous densities of sea stars.

For over a decade, long term monitoring has been conducted by:
Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) and **Multi-Agency Rocky Intertidal Network** (MARINe)

STUDY SPECIES


Pisaster ochraceus


Patiria miniata


Pisaster giganteus


Orthasterias koehleri


Pisaster brevispinus


Pycnopodia helianthoides


Henricia sp.


Dermasterias imbricata


Mediaster aequalis


Leptasterias sp.

Photos by Chad King and Steve Lonhart

INTERTIDAL SURVEYS

Sampling Method: record species count, size, and wasting category for each sea star

Survey Area:

a) Within permanent plots established for long term monitoring

b) Along swaths established for biodiversity surveys

Wasting Categories:

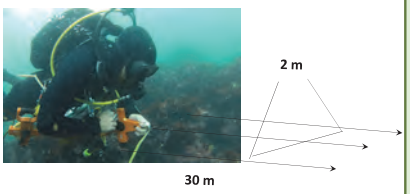
0 Healthy
1 Lesions on one arm or body
2 Deteriorating arm(s) or lesions on 2 arms or 1 arm/body
3 Lesions on most of body, missing 1-2 arms
4 Severe tissue degeneration, death, or missing 3 or more arms

SUBTIDAL SURVEYS

Sampling Method: record species count, size class, and wasting category for each sea star

Survey Area: four 30m x 2m swath transects at each depth zone:

SHALLOW (5m)
MID (12.5m)
DEEP (20m)



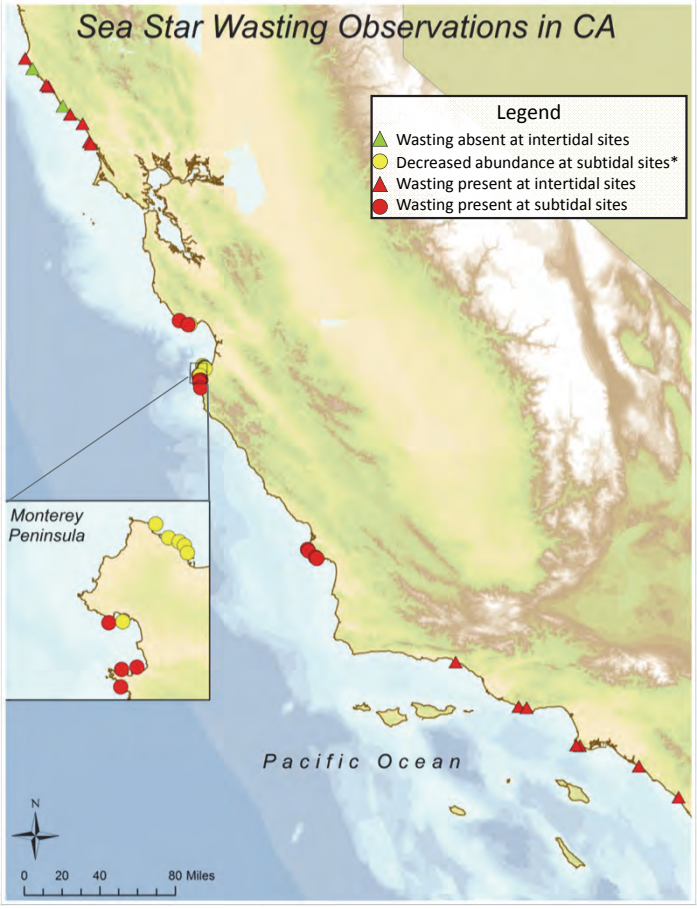
Wasting Categories:

Healthy no abnormalities

Mild lesions or slight degeneration

Severe tissue degenerations, loss of arms, or death

RESULTS



* Decreased abundance: defined as >75% decrease in the density of 1 or more species when compared to previous densities from long term monitoring datasets.

After the onset of wasting syndrome, 34 intertidal and subtidal sites in California were sampled:

- 25 sites displayed wasting during surveys
- 7 sites displayed a severe decrease in sea star density
- 2 sites did not show signs of wasting syndrome

Pycnopodia helianthoides experienced the most severe decrease in density during this study.

FURTHER RESEARCH

Continue surveys on sea star densities and the degree of wasting syndrome to understand:
- the recovery of sea star populations
- the impacts on community structure in intertidal and subtidal ecosystems

ACKNOWLEDGEMENTS

Emily Saarman, Dan Malone, Melissa Miner, Ben Miner, Rani Gaddam, Steve Lonhart, Chad King, Ian Moffitt, Dave Benet, Steve Clabuesch, Dave Minard

PISCO/MARINe, NOAA/MBNMS, the Packard Foundation and Ocean Science Trust, and Western Washington University