Monitoring Marine Protected Areas using Citizen Science
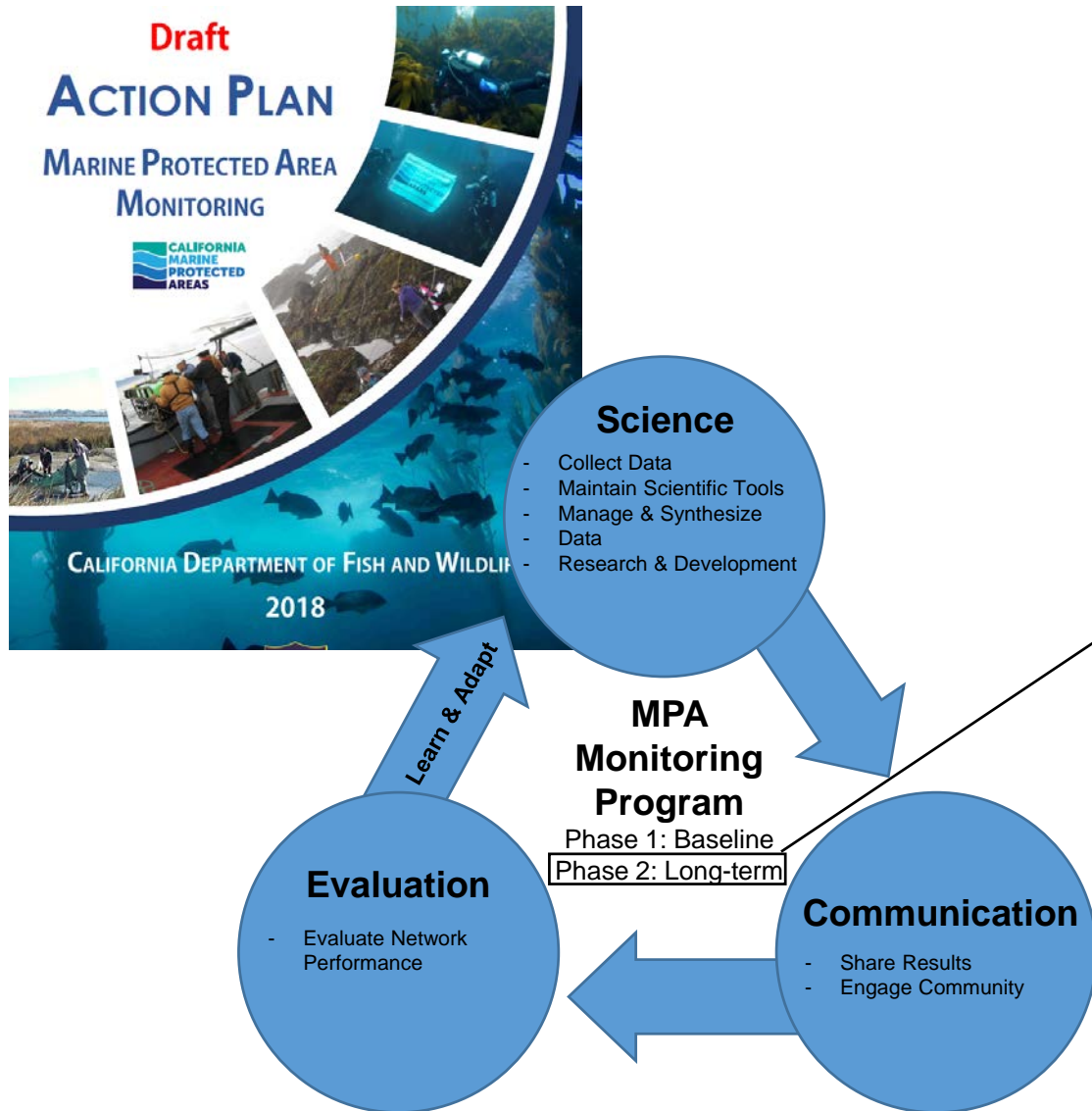
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Marine Protected Area Monitoring Action Plan

Draft
ACTION PLAN
MARINE PROTECTED AREA MONITORING

CALIFORNIA MARINE PROTECTED AREAS

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
2018

Science
- Collect Data
- Maintain Scientific Tools
- Manage & Synthesize
- Data
- Research & Development

MPA Monitoring Program
Phase 1: Baseline
Phase 2: Long-term

Learn & Adapt

Evaluation
- Evaluate Network Performance

Communication
- Share Results
- Engage Community

Phase 2: Statewide Long-Term Monitoring

[…]

Incorporating Existing Approaches
"The MPA Monitoring Program utilizes a partnership-based approach to leverage existing capacity. This approach has established a foundation for generating novel scientific information, tools, and strategies through partnerships with academic institutions, local, state, tribal, and federal governments, citizen science and other organizations, fishermen, and others across the state and beyond".

Citizen Science at the California Academy of Sciences

Snapshot Cal Coast
Annual California statewide effort to document coastal biodiversity by holding a series of bioblitzes up and down the coast

Bioblitzes and regular monitoring of rocky intertidal

Citizen Science at the California Academy of Sciences

Most observed species are rocky intertidal species

Pisaster ochraceus

Triopha maculata

Anthopleura xanthogrammica

Anthopleura sola

Strongylocentrotus purpuratus

Okenia rosacea

Dermasterias imbricata

Mytilus californianus

Egregia menziesii

Citizen science observations are biased
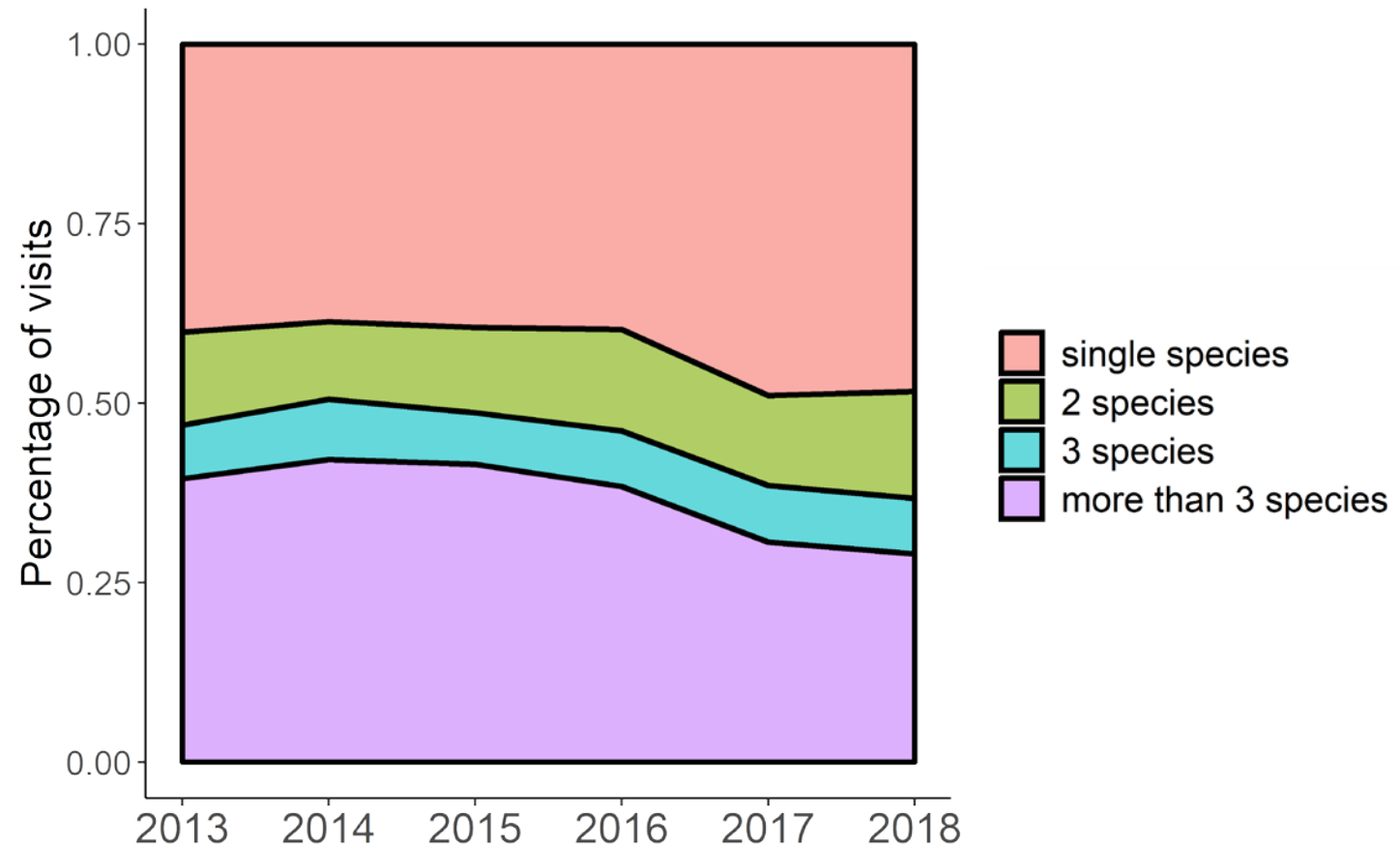
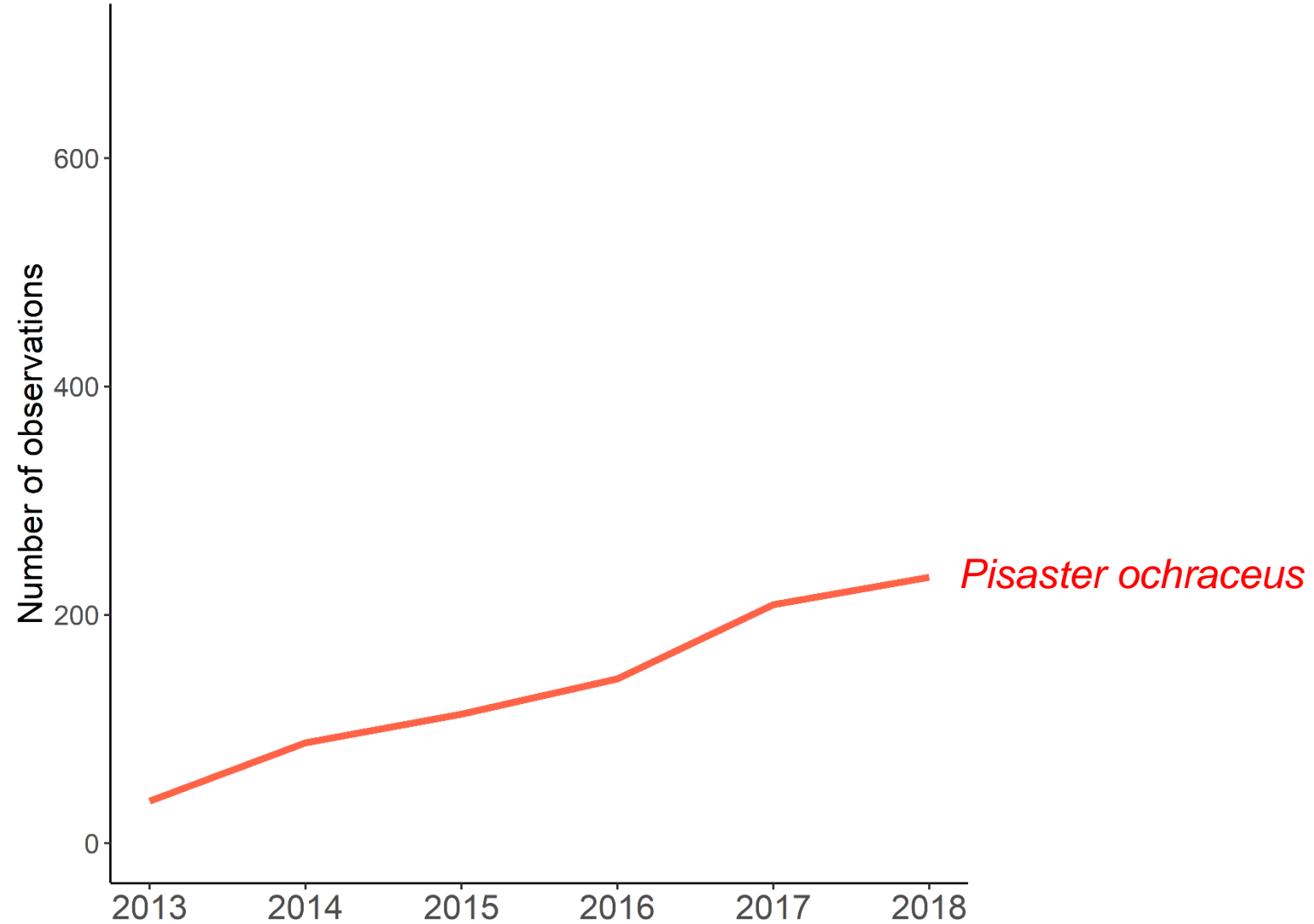## Uneven coverage in space

Uneven coverage in time
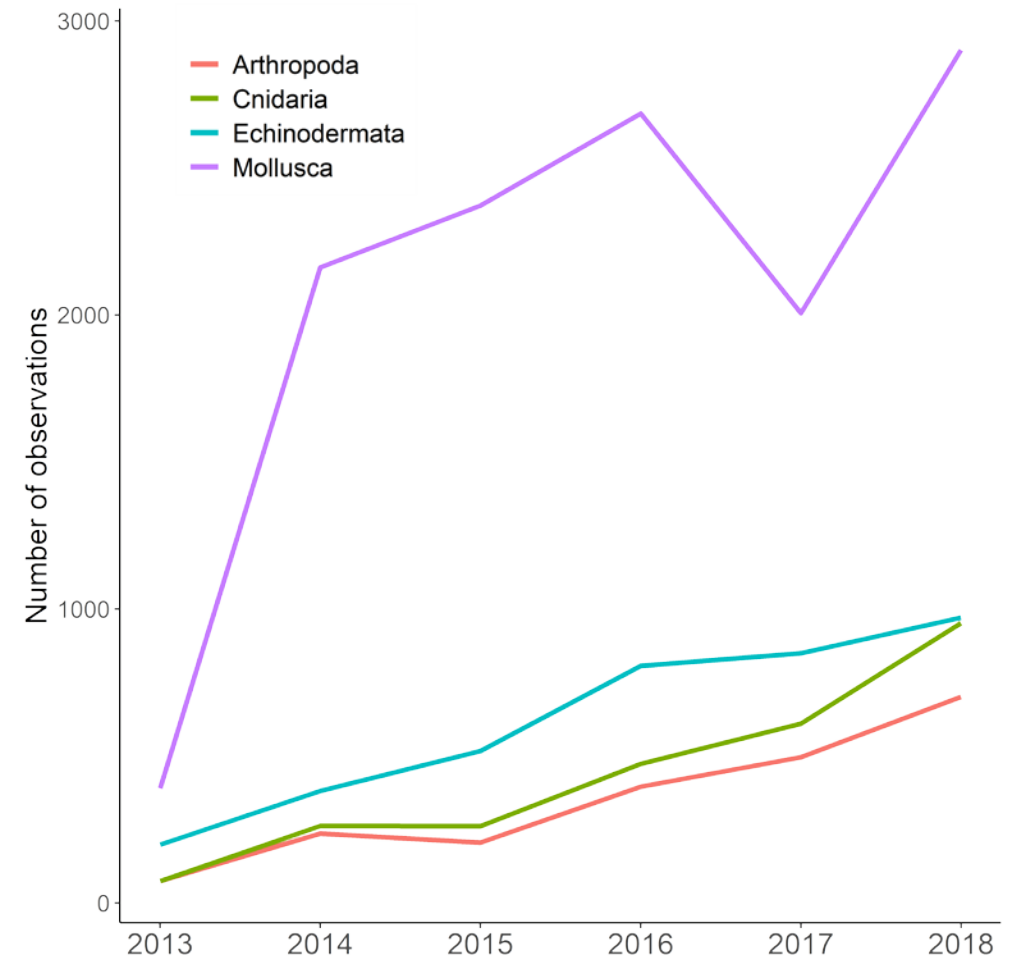
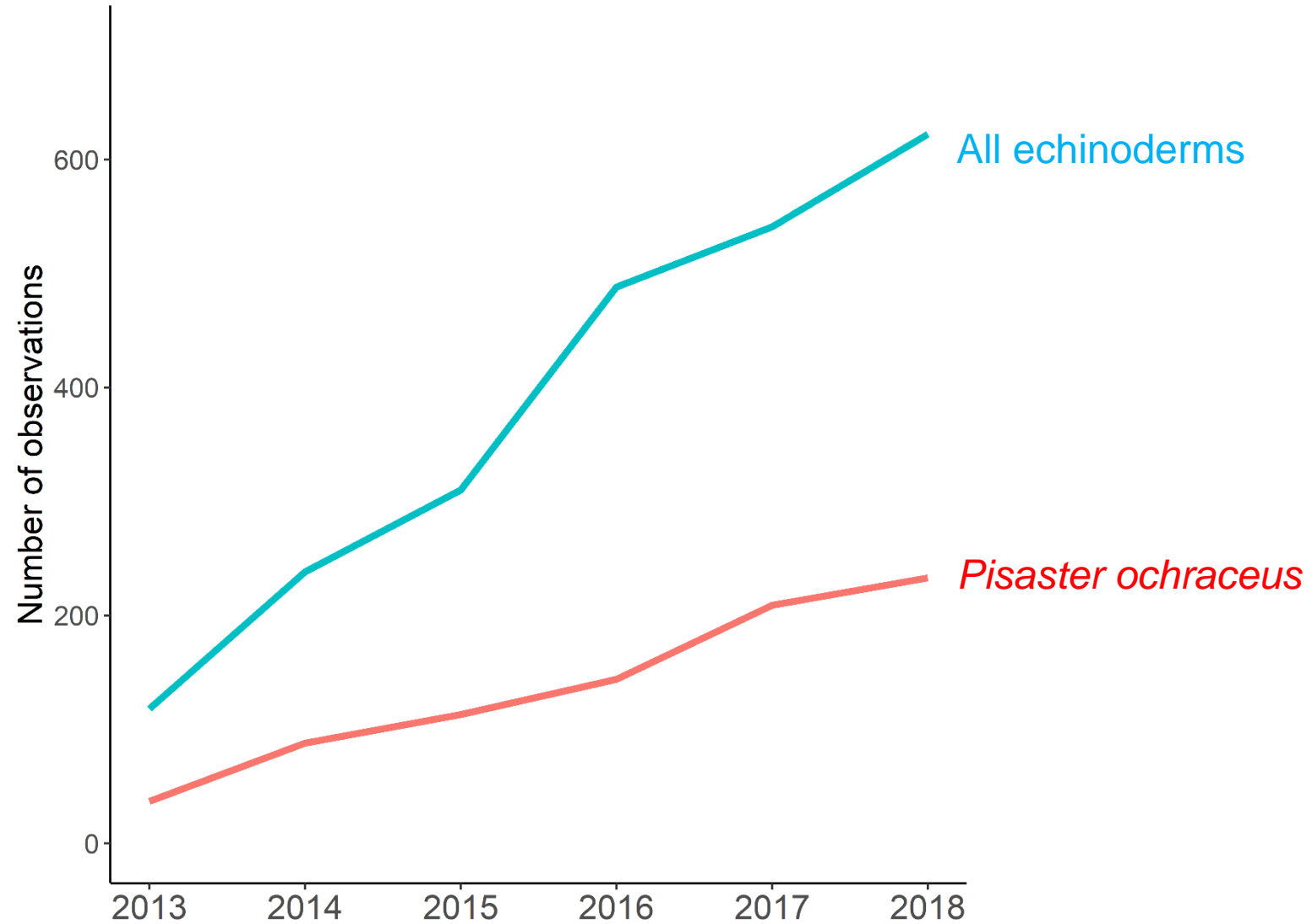# Citizen science observations are biased

Uneven observation effort
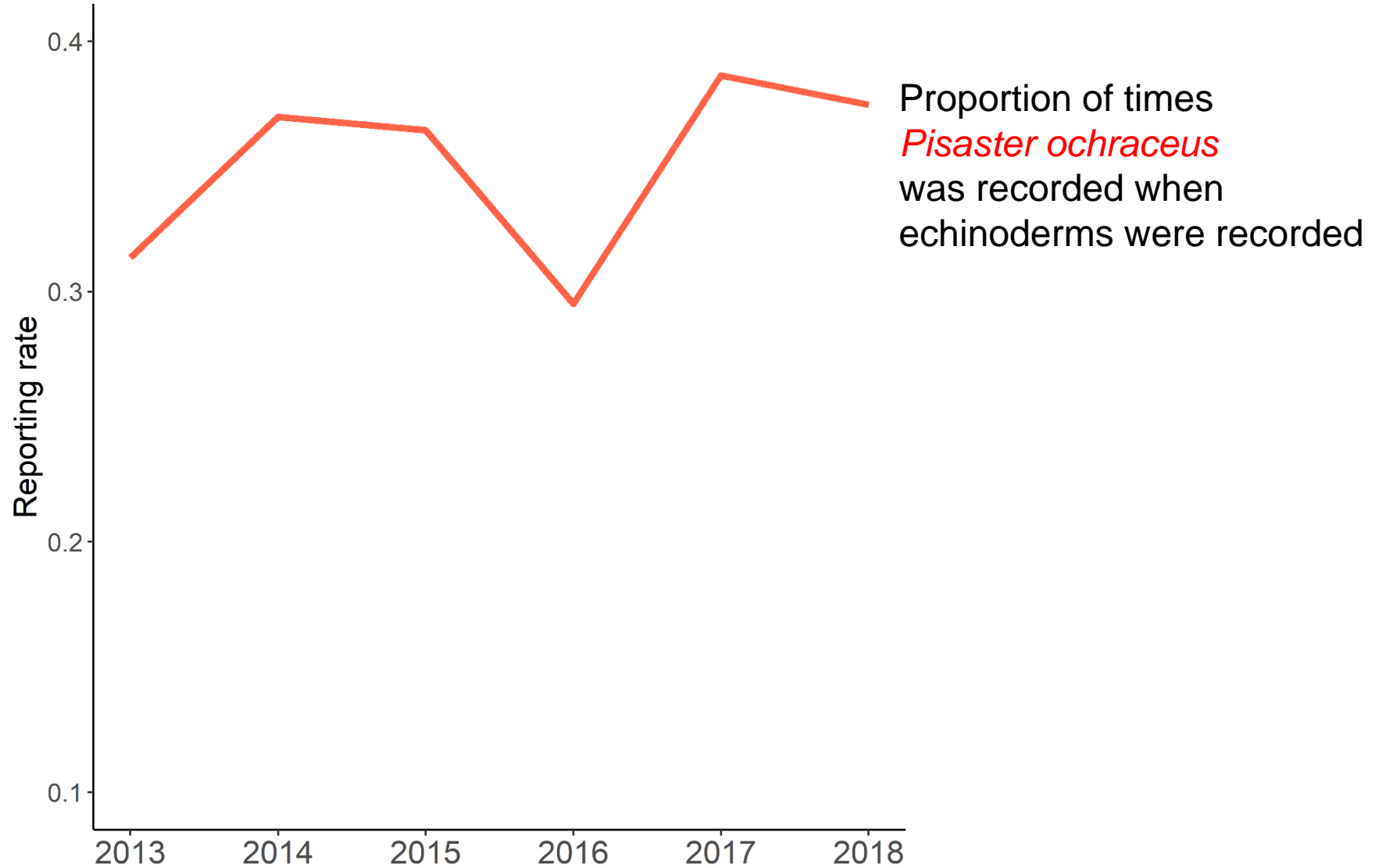
Extracting signals of change from citizen science data

Pisaster ochraceus

Extracting signals of change from citizen science data

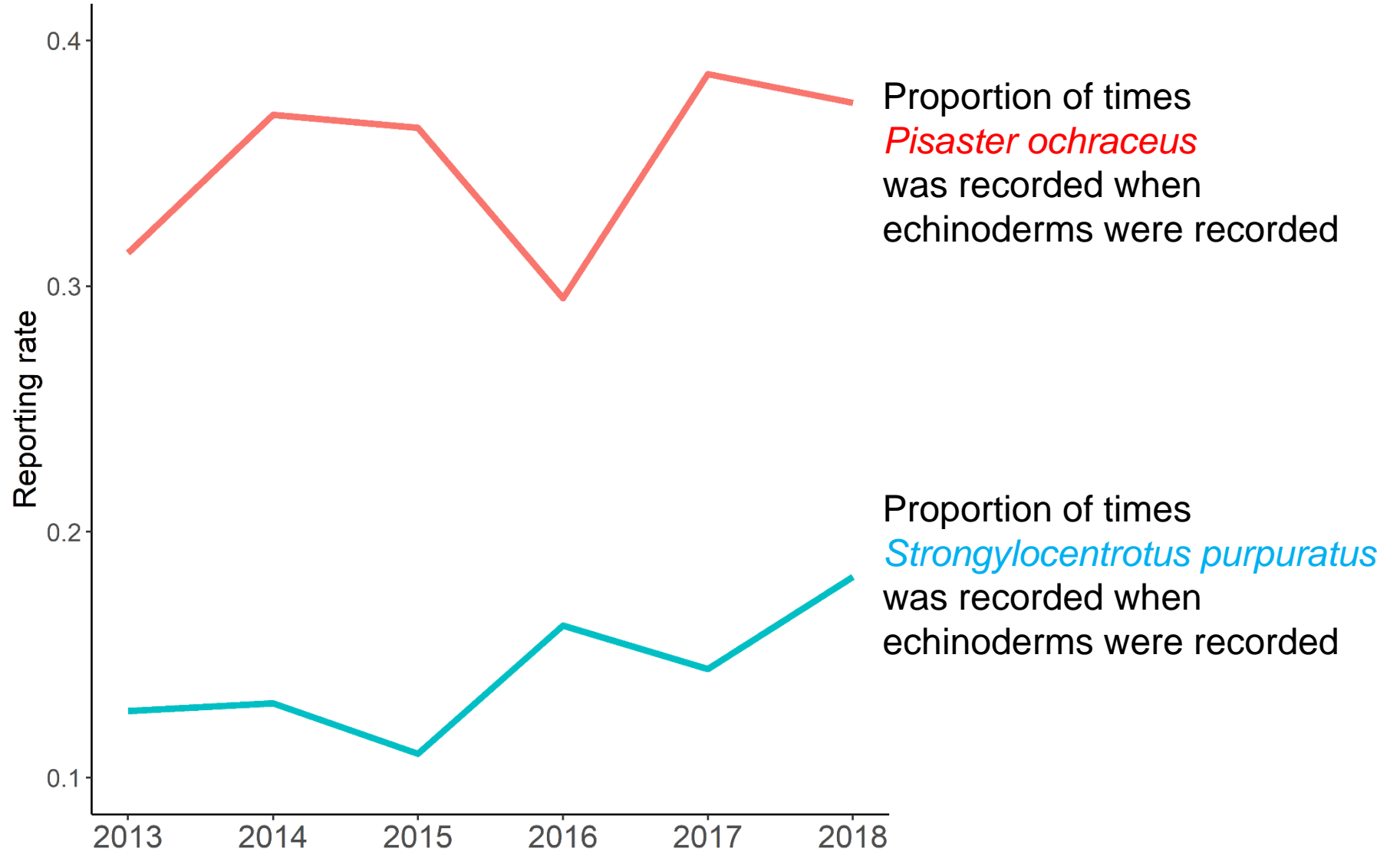# Extracting signals of change from citizen science data

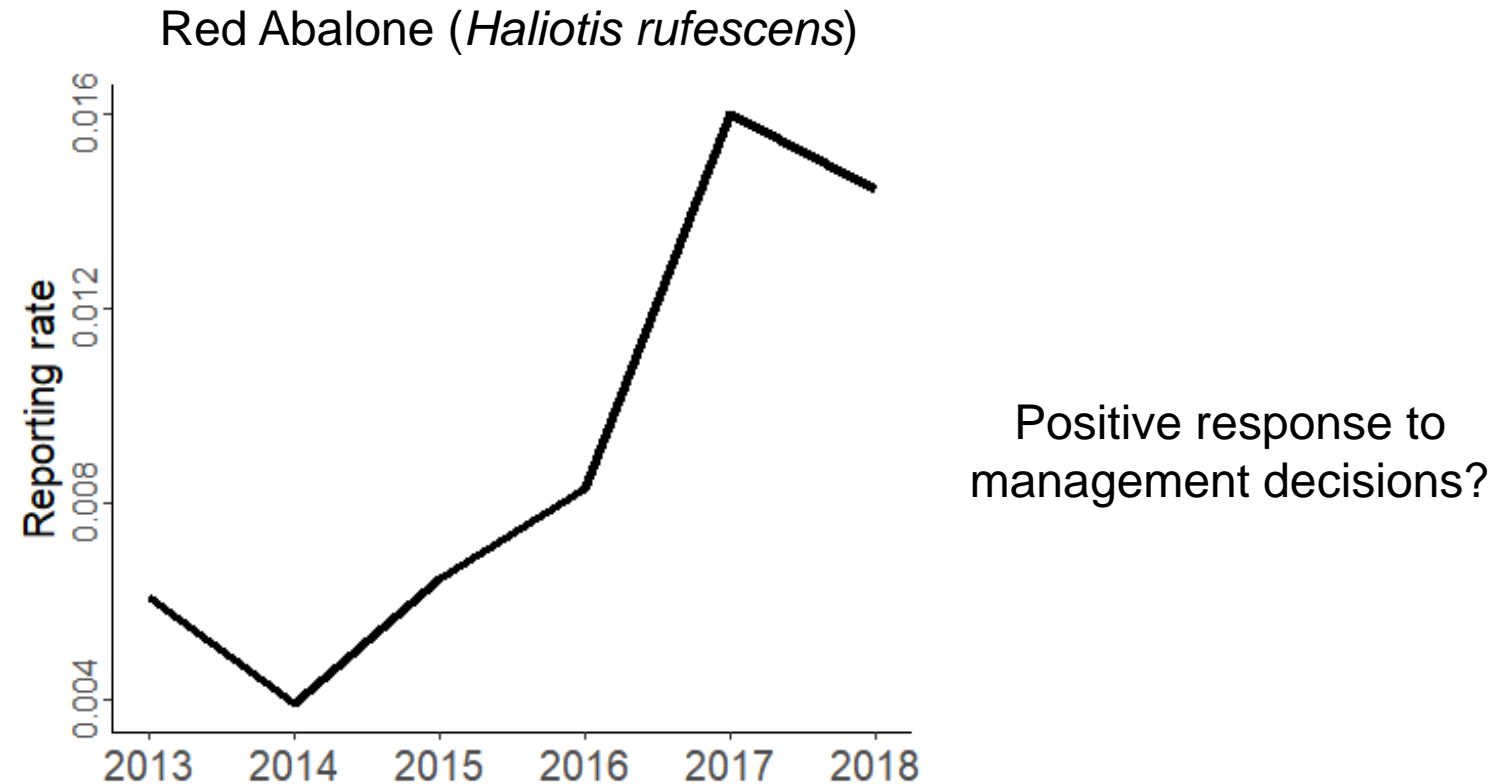Proportion of times *Pisaster ochraceus* was recorded when echinoderms were recorded

Extracting signals of change from citizen science data

How is this useful for management?
Early-warning indicators of ecological transitions

Example 1: Monitoring potential population recoveries

Red Abalone (*Haliotis rufescens*)
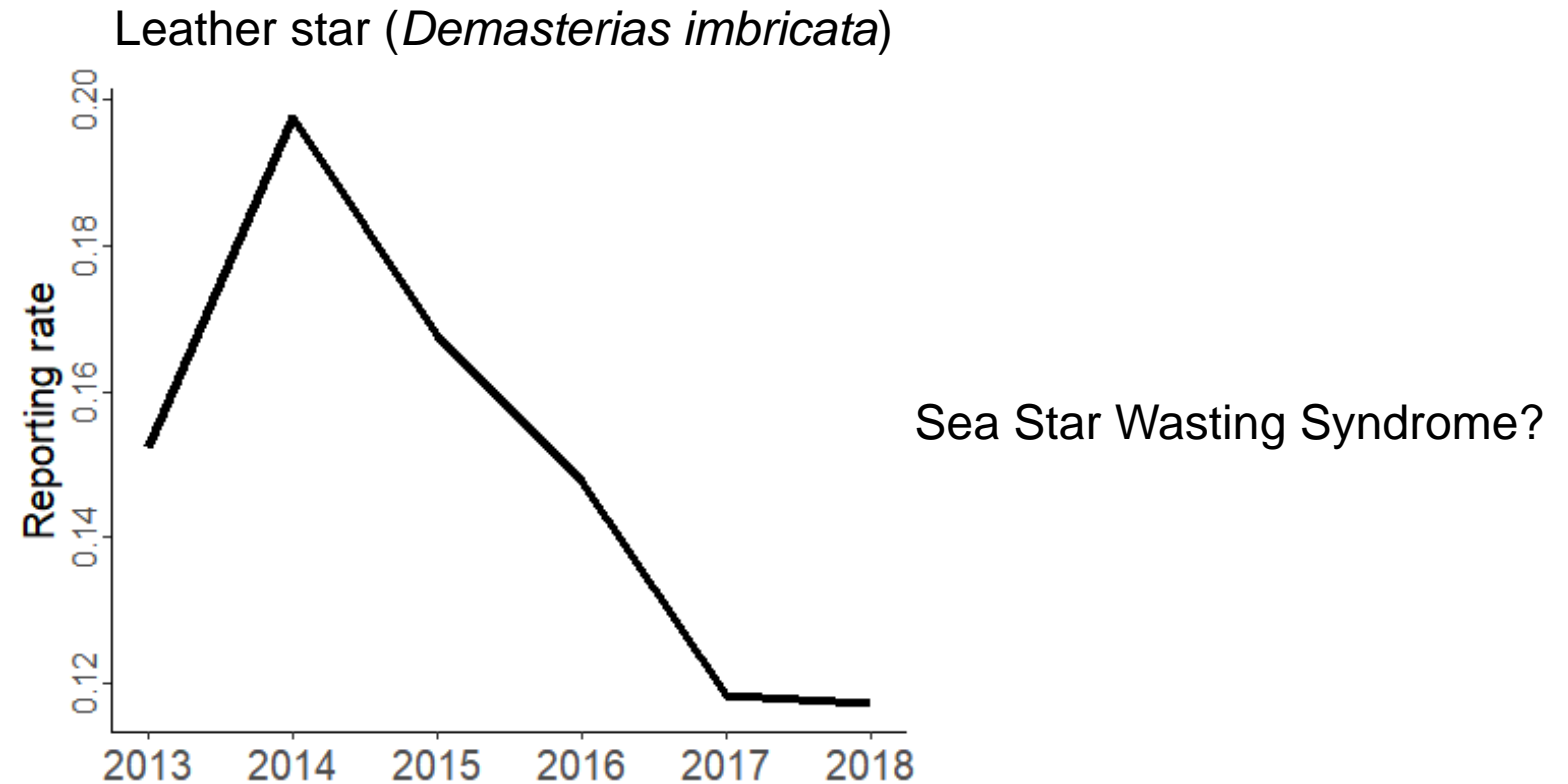

Positive response to management decisions?

How is this useful for management?
Early-warning indicators of ecological transitions

Example 2: Monitoring potential population declines

Leather star (*Demasterias imbricata*)
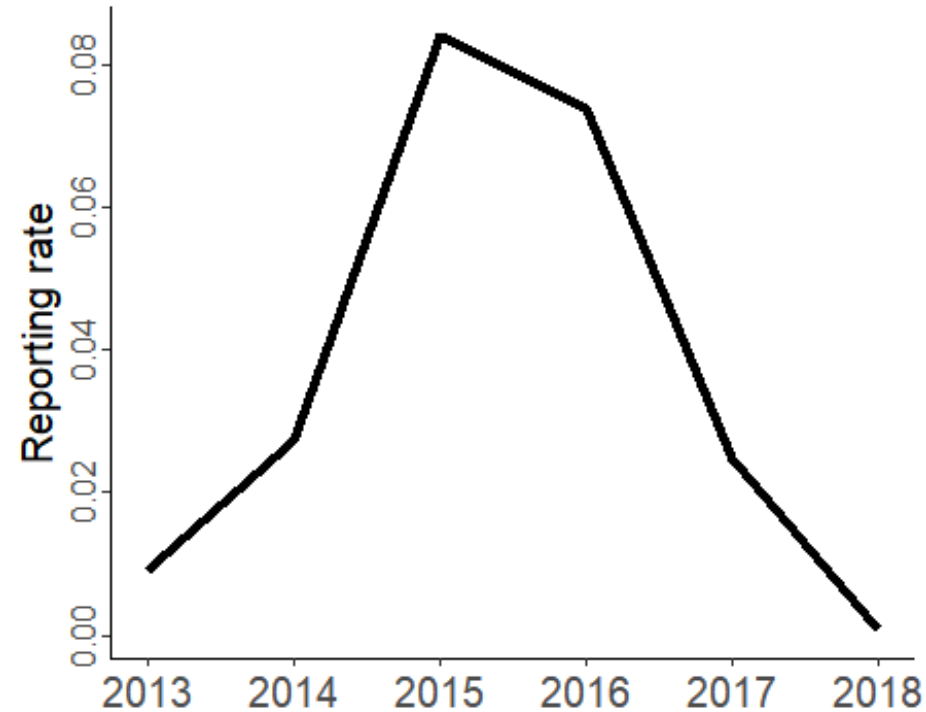
Sea Star Wasting Syndrome?

How is this useful for management?
Early-warning indicators of ecological transitions

Example 3: Monitoring changing ocean conditions

Hopkin's rose nudibranch (*Okenia rosacea*)

Tracking warmer water temperatures?

Still lots to do – this is only the beginning!

**We'd love to hear your feedback
on potential applications**

Get in touch!

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