

# Storm impacts on the seabed in protected and fished areas

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
# one The Storms That Shook the South West

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This programme is not currently available on BBC iPlayer

Sam Smith meets the people whose lives and livelihoods took a battering from the worst storms in living memory and asks whether it's time to rebuild or retreat.

 29 minutes

## Last on

**BBC  
one**

Mon 12 May 2014

19:30

BBC ONE

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## Storm leaves Dawlish railway line dangling

5 February 2014 Last updated at 12:18 GMT

The railway line at Dawlish in Devon is left hanging in mid-air after storms ripped away supporting ballast, wrecking up to 150ft (46m) of track.

Labour MP for Exeter, Ben Bradshaw has called for the government to



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## PICTURES: The storm that left Plymouth battered and bruised

By [Plymouth Herald](#) | Posted: February 06, 2014



# Impacts to the seabed



- Port Wrinkle and Wembury banks of kelp
- Reports from fishermen that pots had been moved
- Keith Hiscock (2014) after the storms: Collation of observations

# 2008-2013 “Before” baseline

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2008

2009

2010

2011

2012

2013

- Assess the impact of the storm
- Test the hypothesis that protected reefs are more resilient to disturbance events than areas that are open to fishing (see Tett et al 2013)

**Last minute funding ...**

**Natural Environment Research  
Council**

**Pig Shed Trust**

**SWIFA  
SWFPO**

# Talk content



- Importance of biogenic reef services
- Storm impact results
- Relevance for conservation and management

# Importance of temperate biogenic reefs

# Nursery/Protection

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# Feeding habitat/egg case

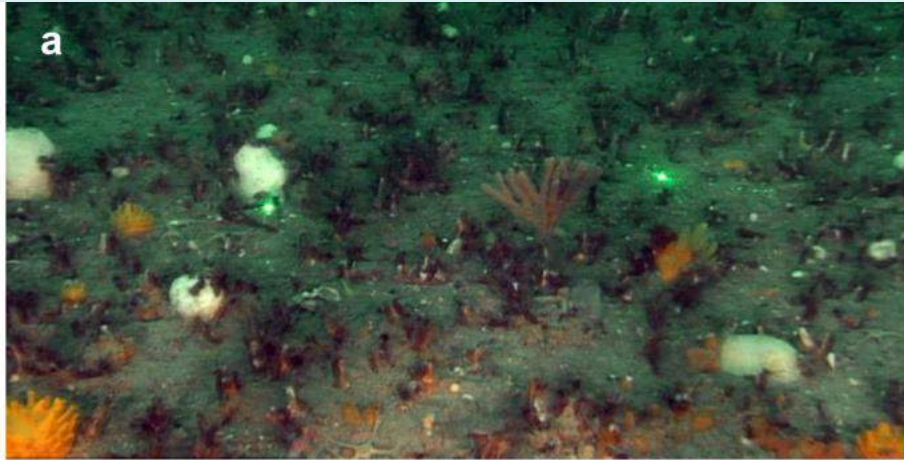
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# Spat settlement

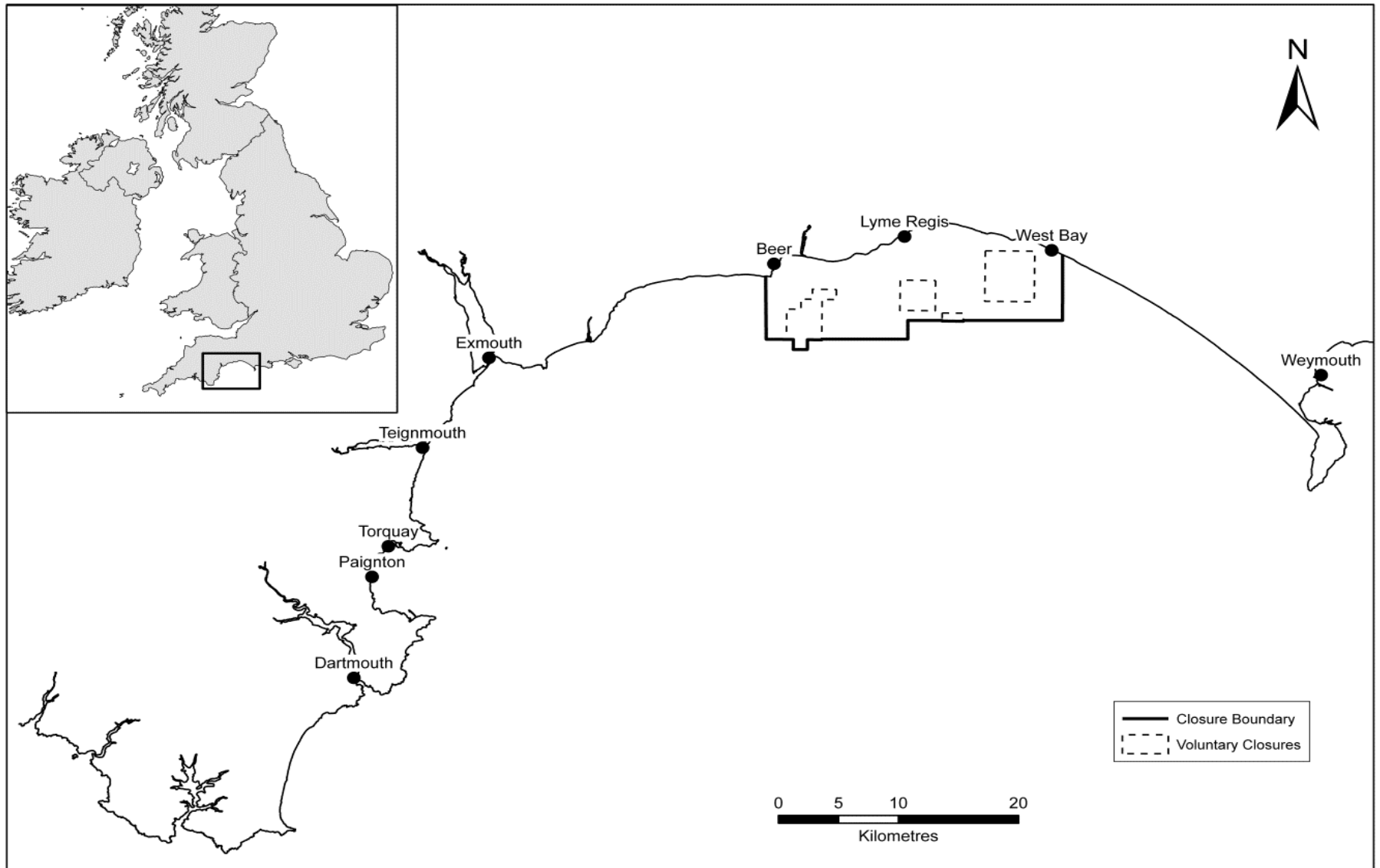


# Stabilise sediments

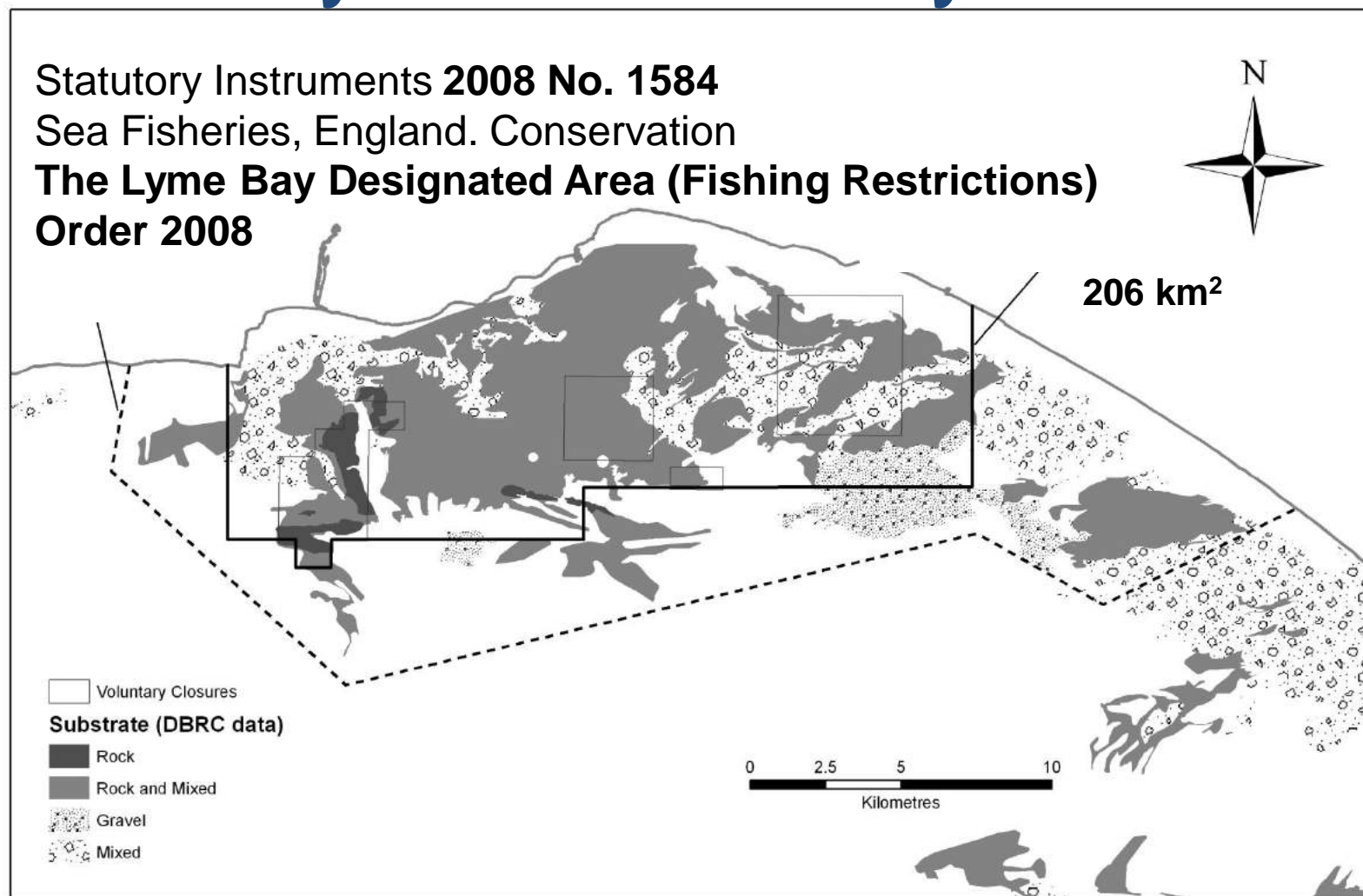


Sheehan et al 2013 Mar. Poll. Bull

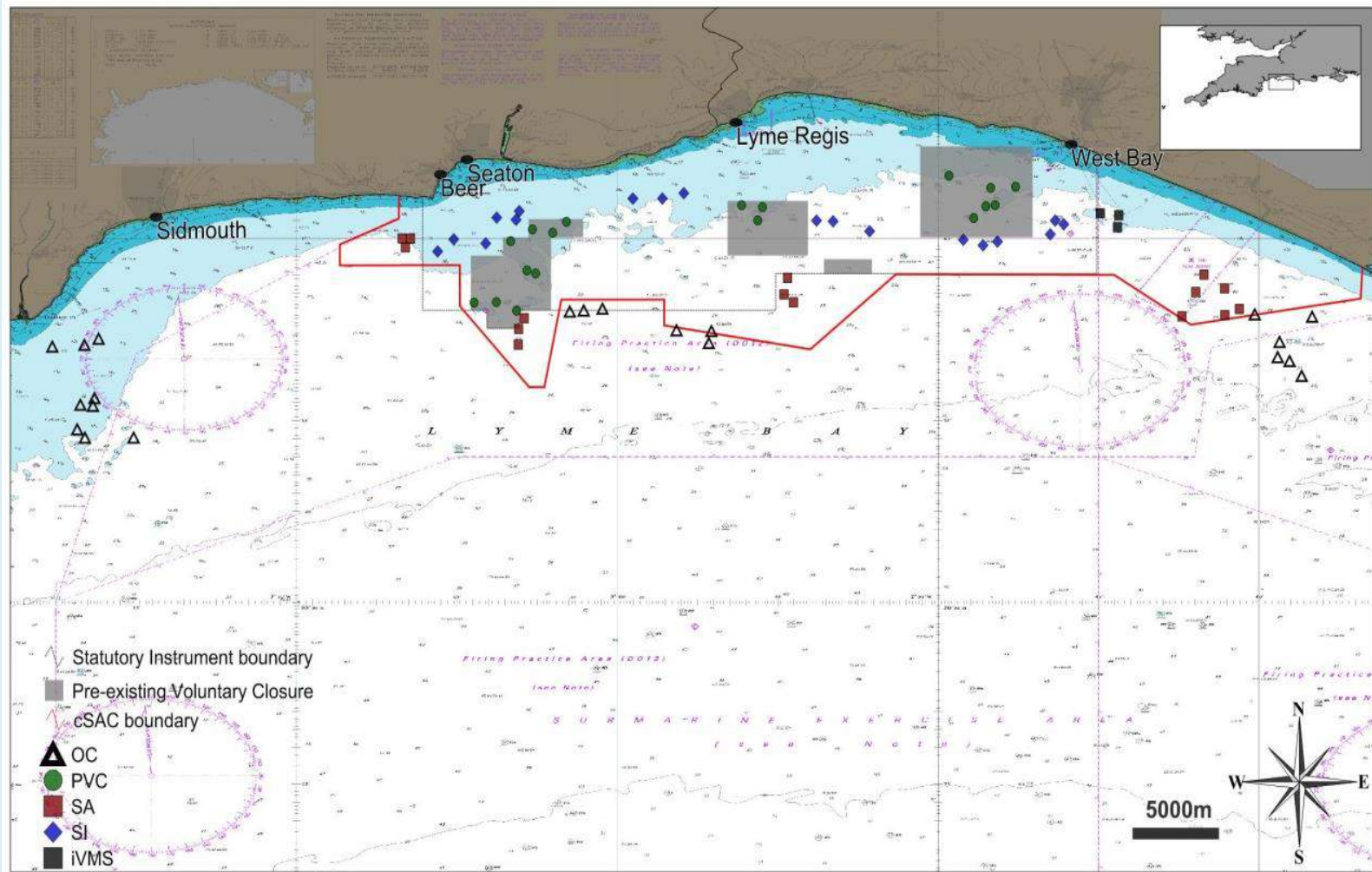
# Lyme Bay Statutory Instrument



# Lyme Bay SI – 11<sup>th</sup> July 2008



# 2008 -2014



Sheehan, et al Mar Poll Bull (2013)

# Methods

## Flying Towed Array – HD

(1)



- Relatively non-destructive
- Cost and time effective (8x 200 m transects per day)

• Sheehan, Stevens, Attrill (2010) PLOS ONE

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# Storms 2013 -2014

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# Storms 2013 -2014



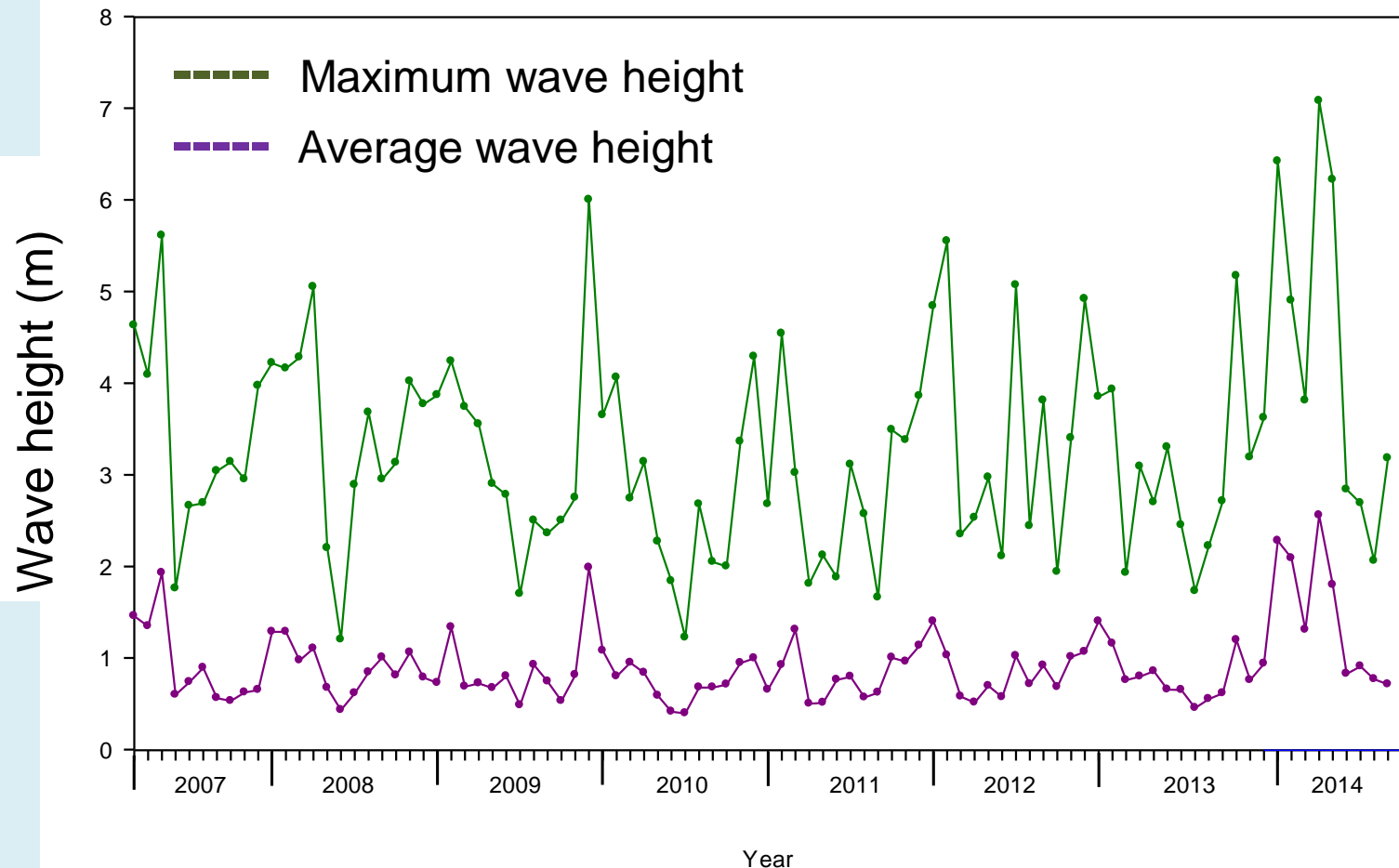
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# Storms 2013 -2014



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# West Bay Wave Buoy Channel Coastal Observatory



# Three components:

- 1. Comparison between MPA and Open areas**
2. Resilience of benthos in different aged MPAs
3. Storm impacts on sediment veneers

# Three components:

## 1. Comparison between MPA and Open areas – predictive model

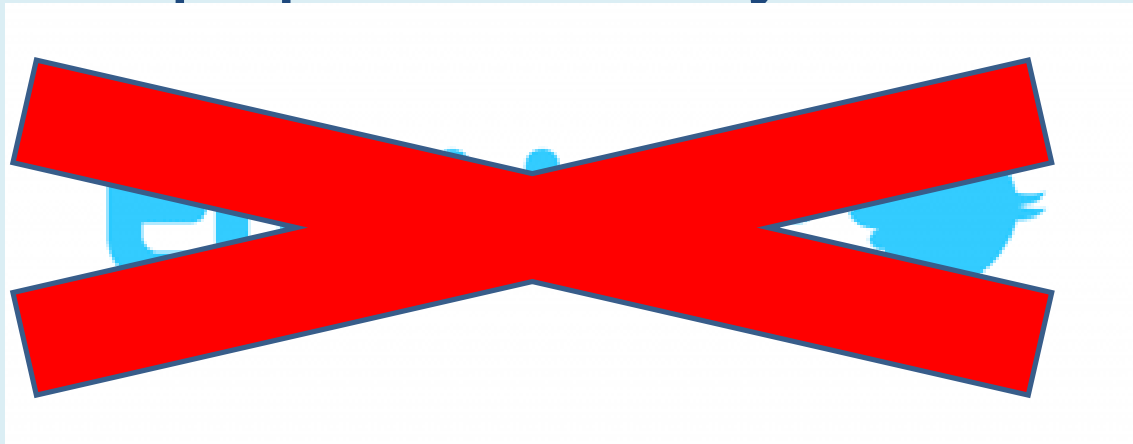
Waiting for wave model data to complete the paper.... Sorry.....!



# Three components:

## 1. Comparison between MPA and Open areas

Waiting for wave model data to complete the paper.... Sorry.....!



# Results

# First observations

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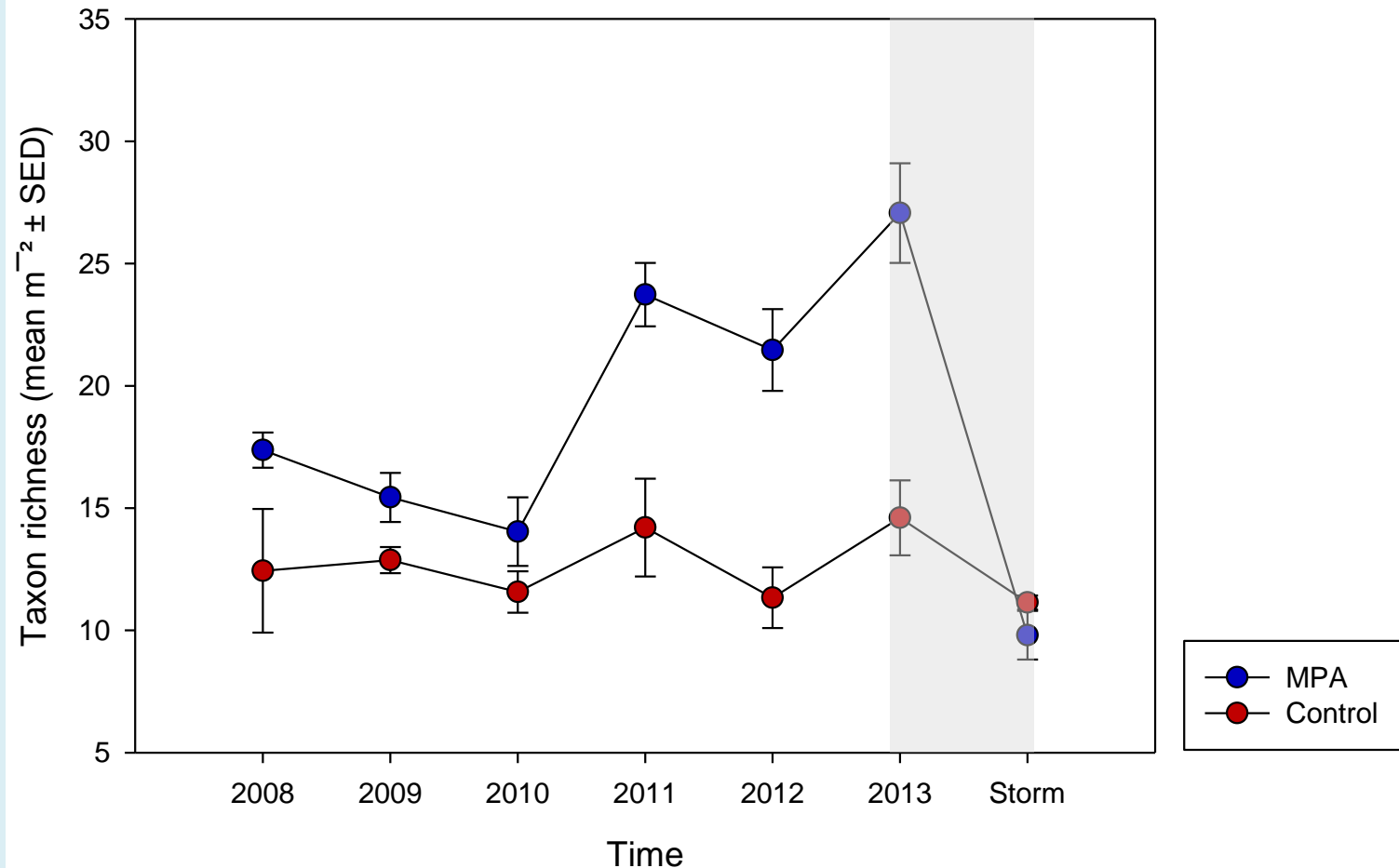


# First observations

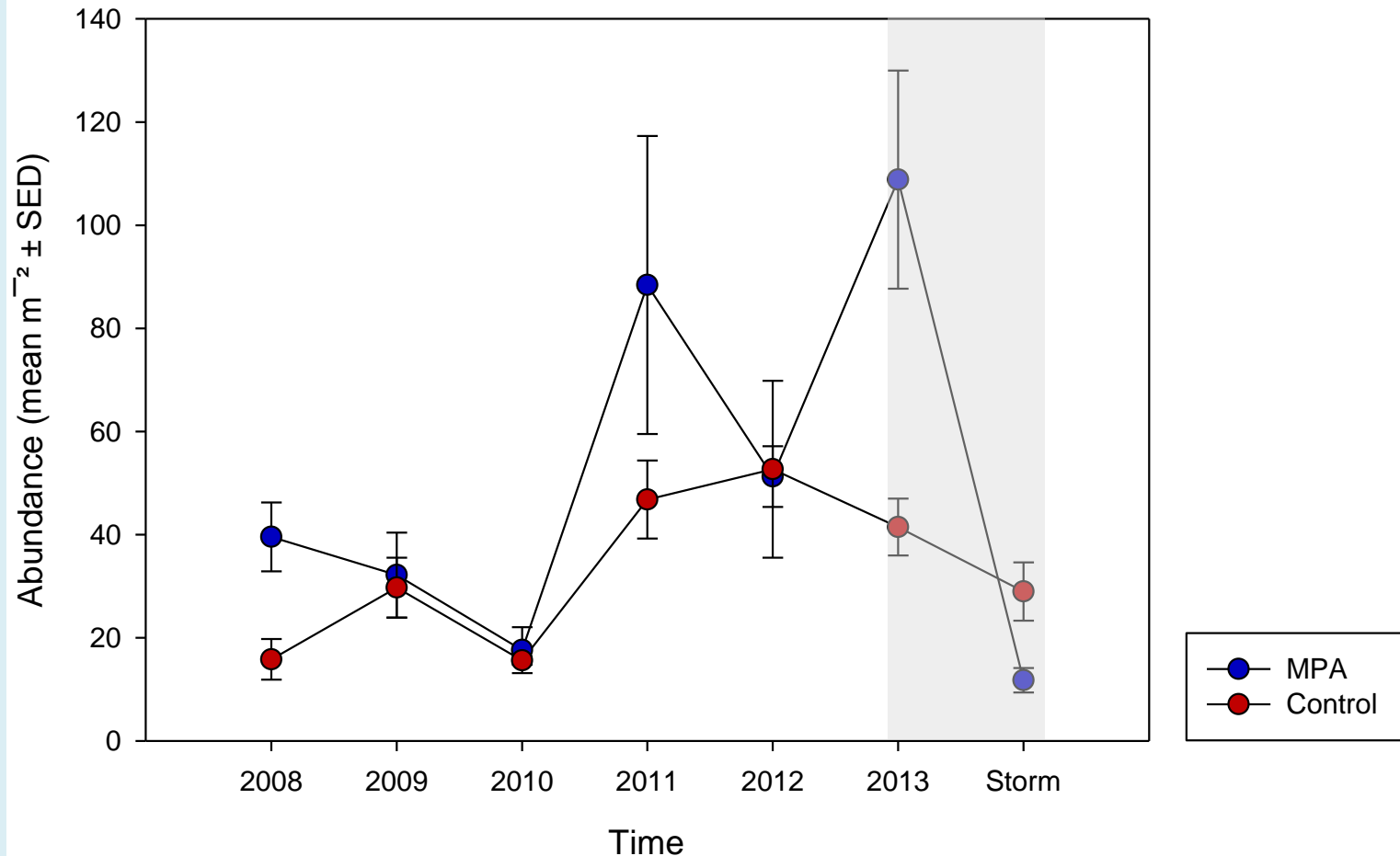
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# Diversity (non seasonal)

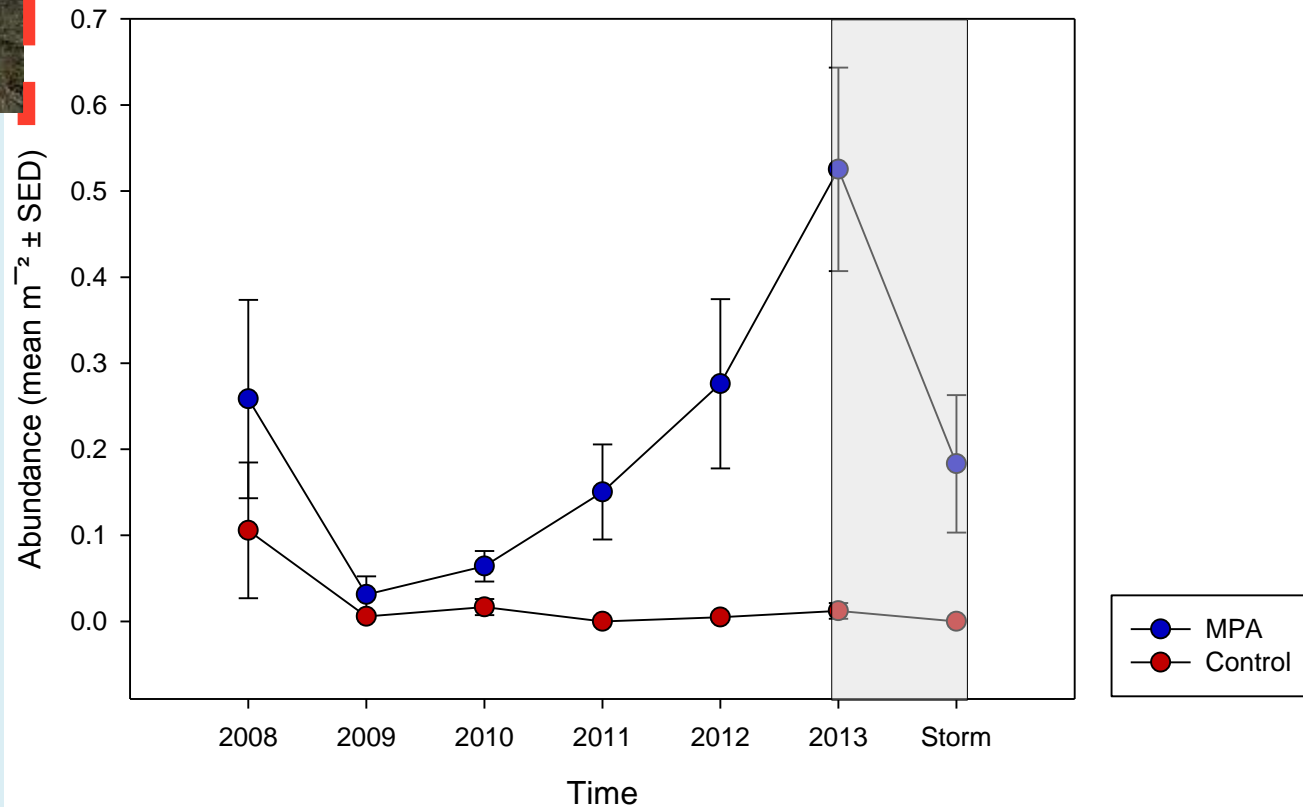


# Abundance (non seasonal)



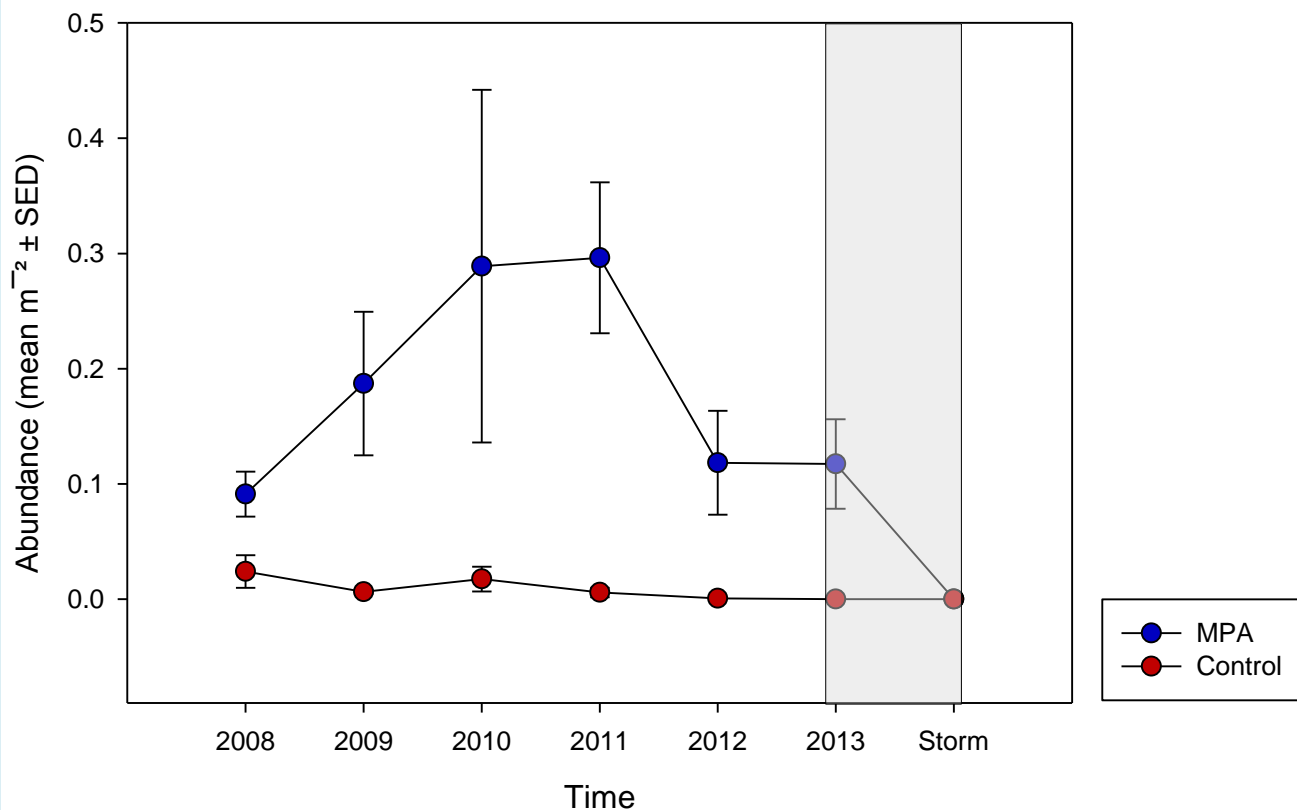


# Branching sponges



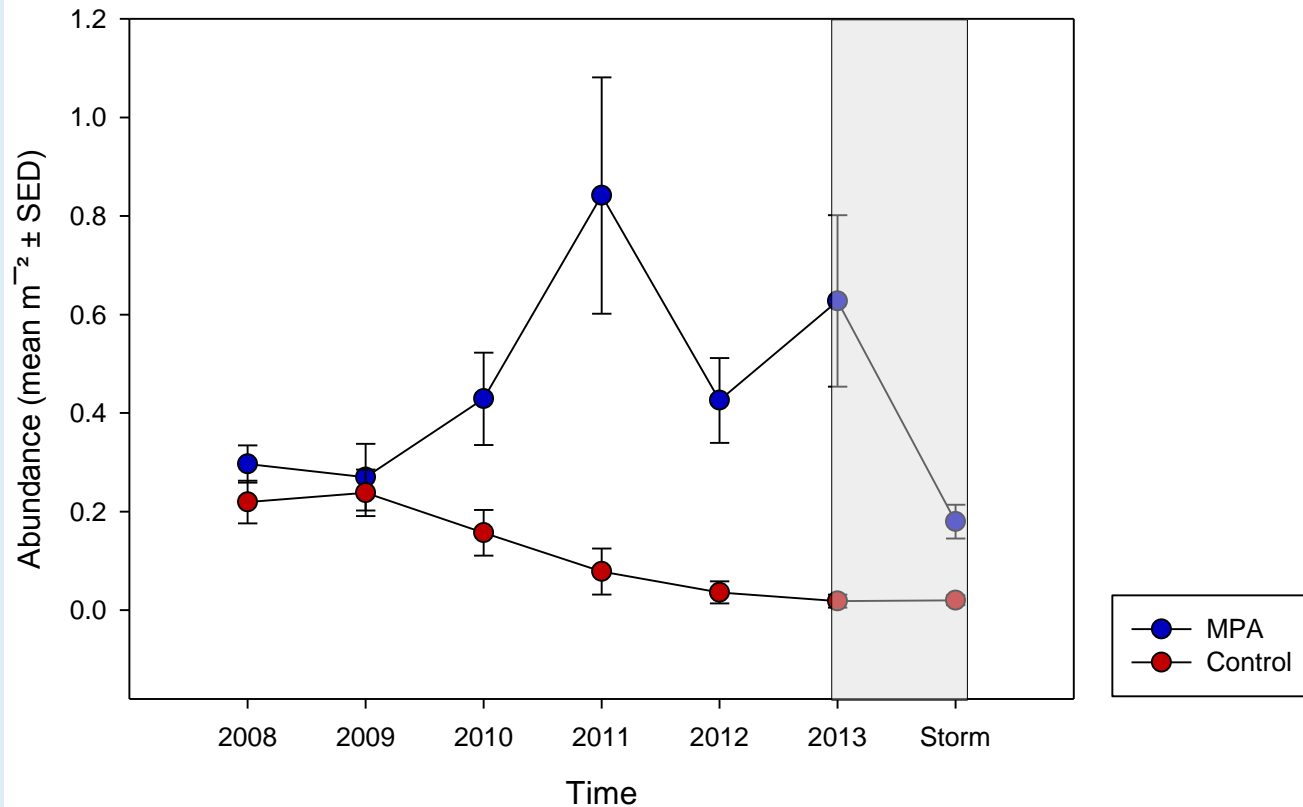


# *Pentapora foliacea*



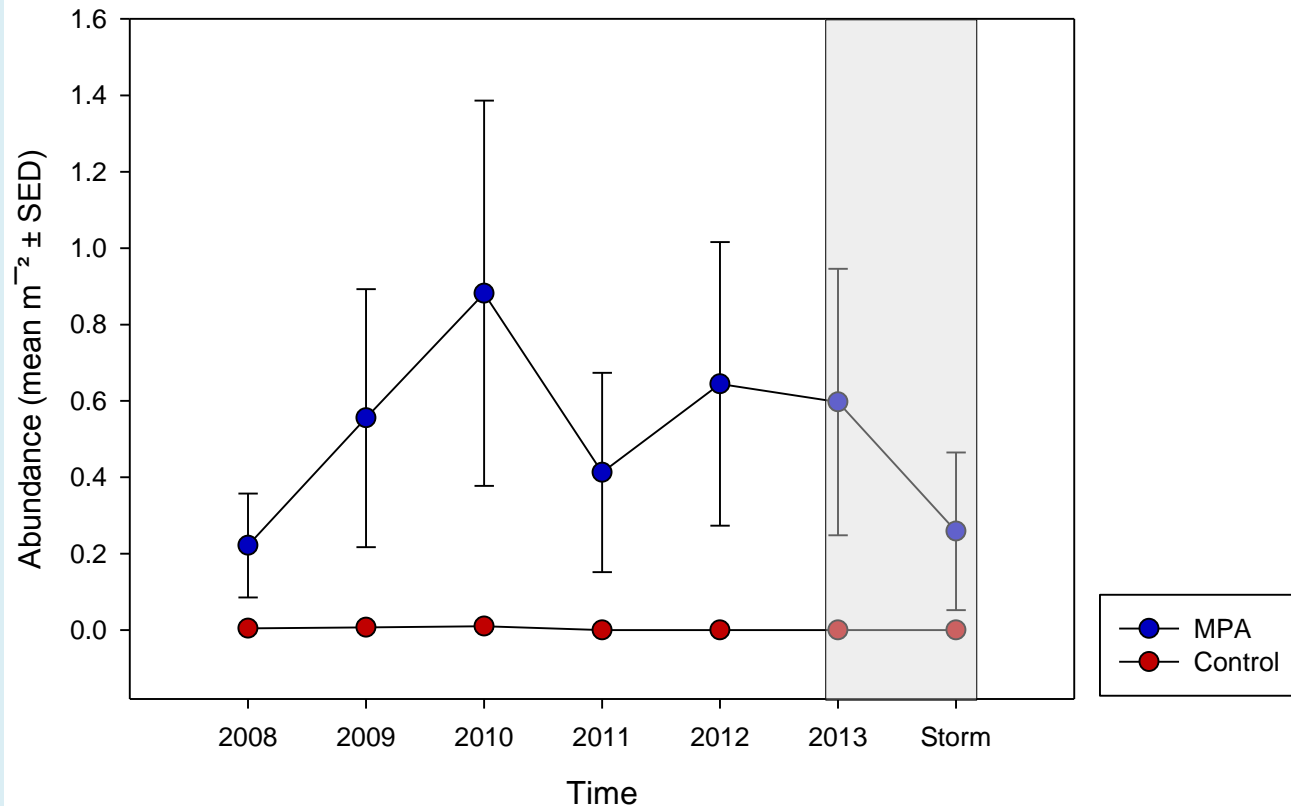


# *Pecten maximus*



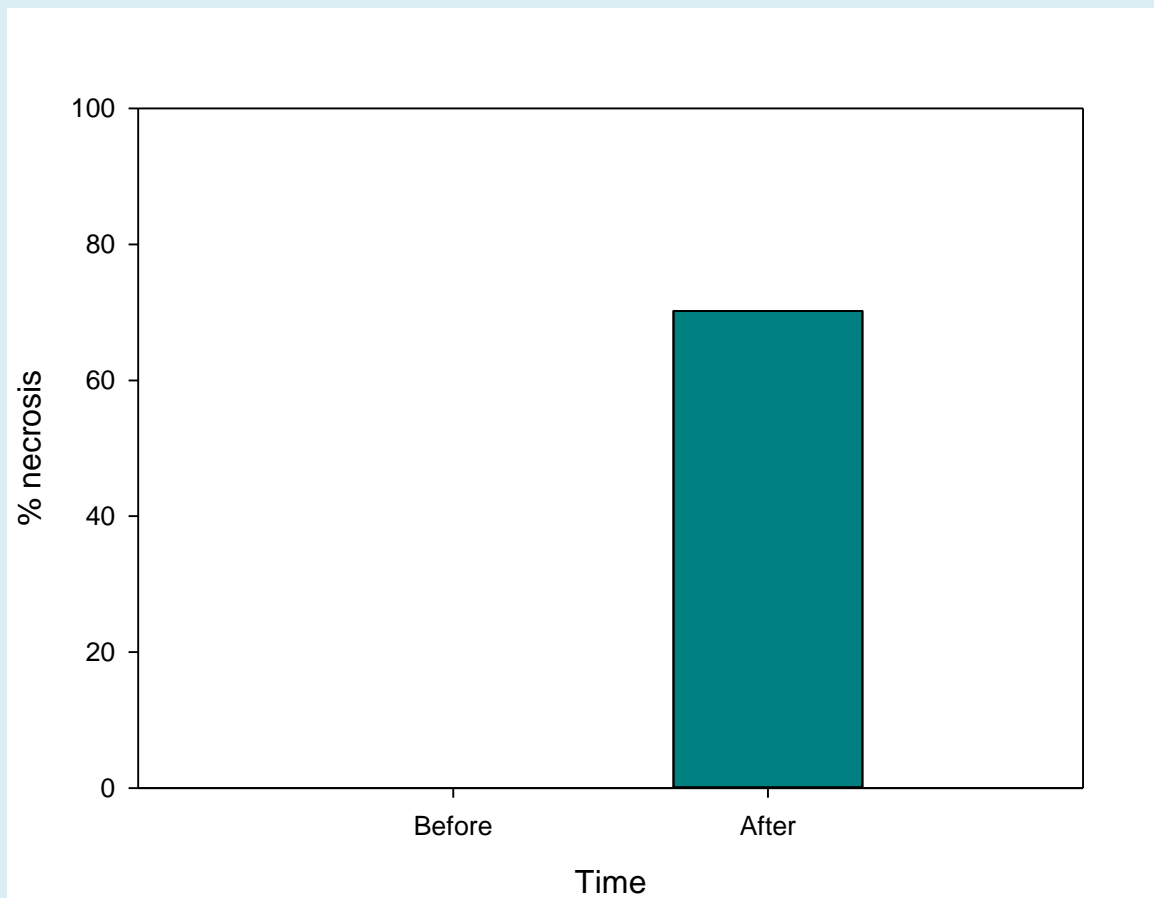


# *Eunicella verrucosa*



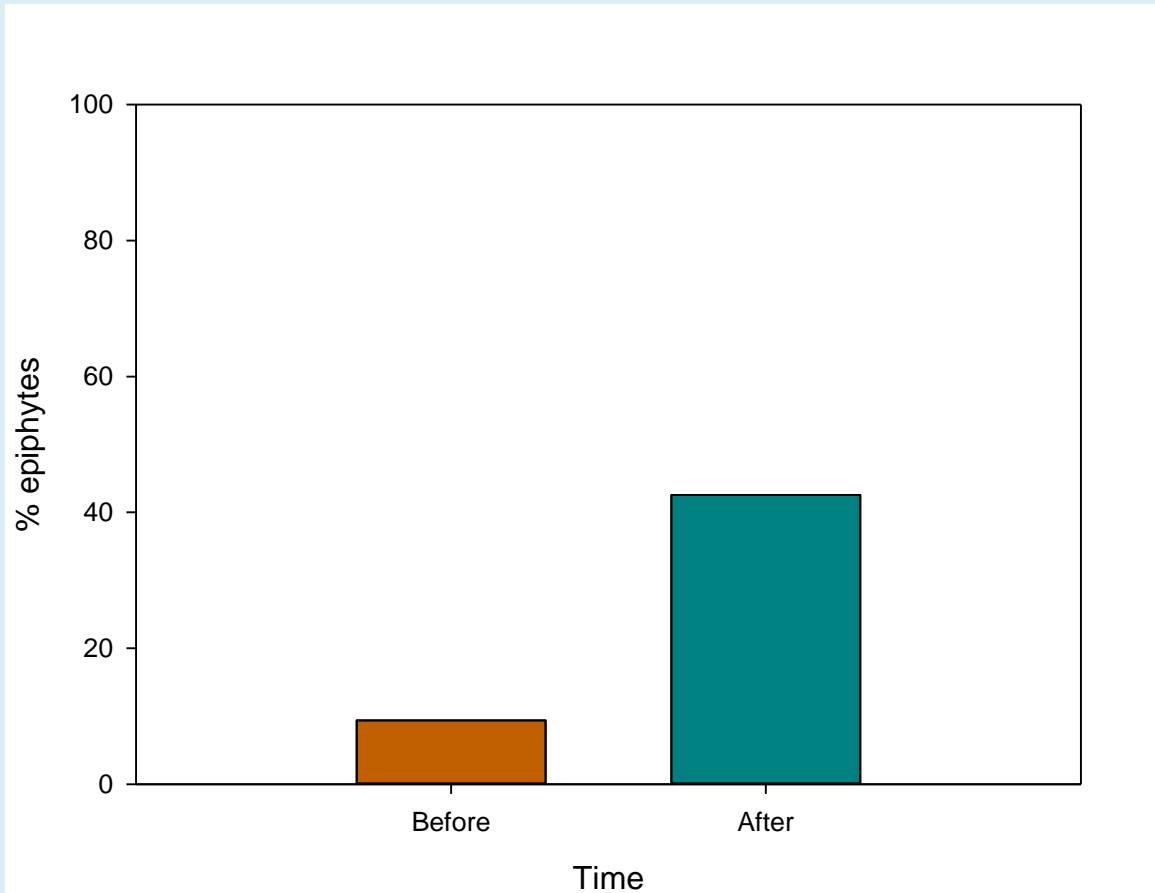


# % *E. verrucosa* necrosis



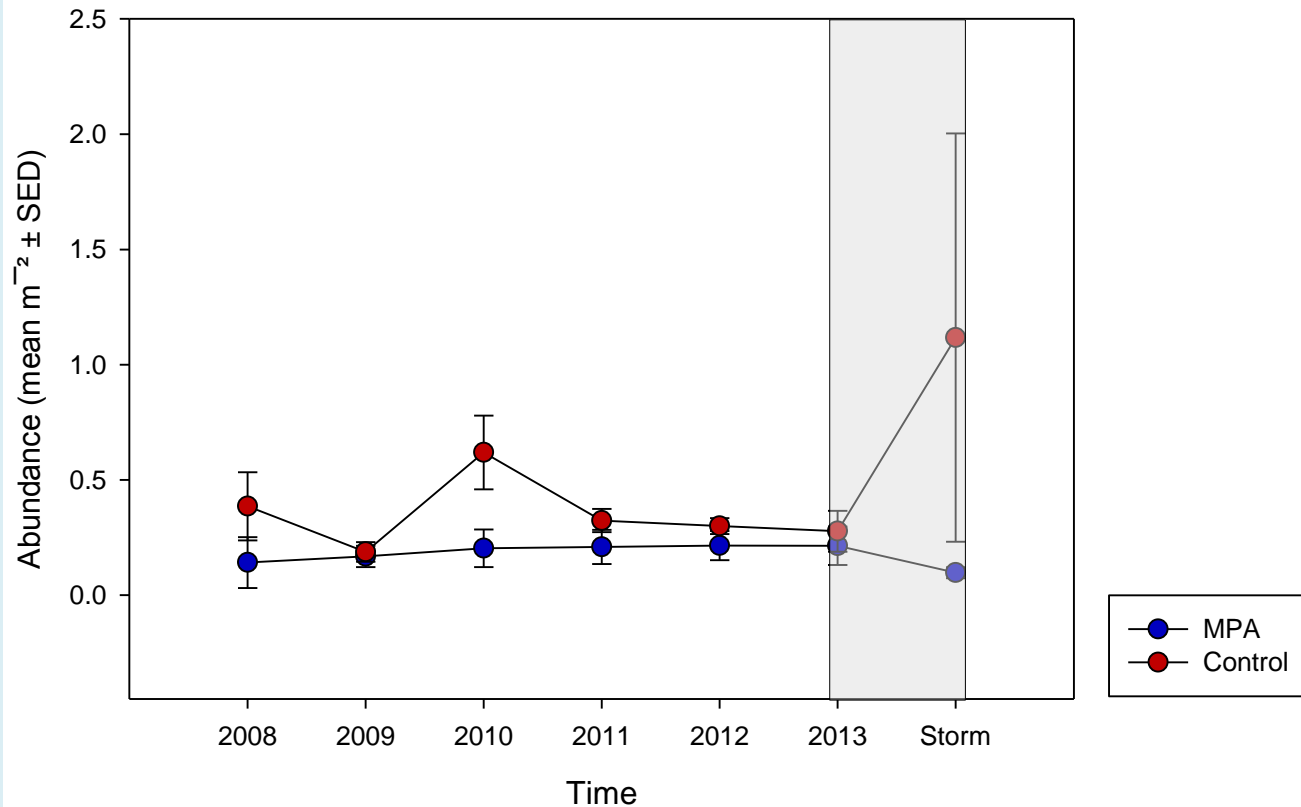


# % *E. verrucosa* epiphytes



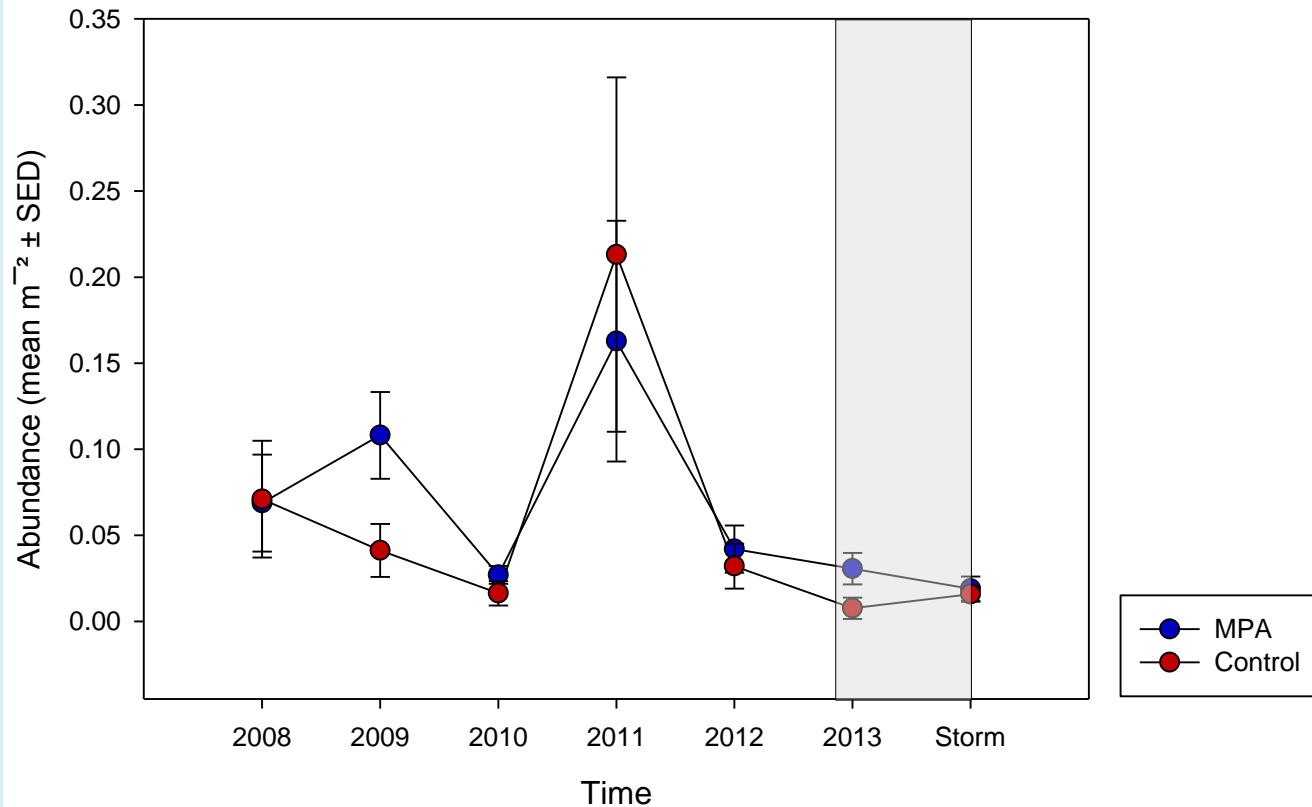


# *Asterias rubens*



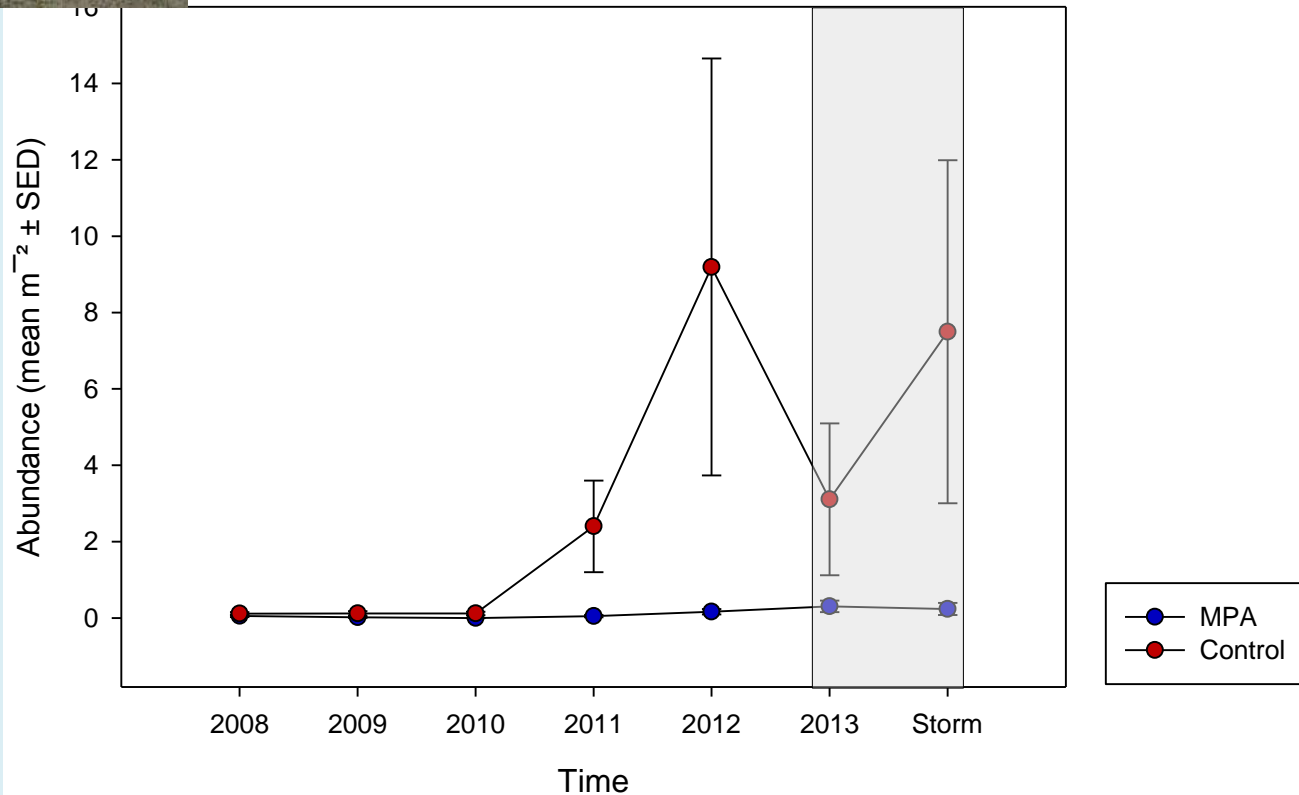


# Gobies





# *Pagurus* spp.



# Relevance for conservation, management and fisheries

## Resilience hypothesis

Significantly greater changes inside the MPA as the species in open controls were better adapted to disturbance but they are maintaining an unfavourable system for delivering a range of ecosystem services.

# Thoughts

- Why did the storms cause so much damage to the seabed?
- Why did the MPA not stand up better to the storms
- Resistance → Recovery?



# Conclusions

- The box had not been protected long enough to be resilient against storms
- Open areas were resilient against storms but were only maintaining an undesirable state
- Important to compare recovery from storms with recovery from bottom towed fishing



# Acknowledgements

- Funders: NERC, Pig Shed Trust, SWIFA, SWFPO, Defra, Natural England
- Thank you to the people who helped to protect LB reefs
- Robert King (Blue Turtle skipper), John Walker and Kieran Perree (Miss Pattie skippers past and present)
- Richard Austin for providing images
- Statistical support from Marti Anderson and Bob Clarke

