The science behind the marine conservation story

Debbie Freeman, PhD
Department of Conservation
Marine Ecosystems Team
Wellington, New Zealand

Department of Conservation
Te Papa Atawhai

Overview

Role of science in marine protected area planning and management

MPA research and monitoring – what have we learned and where are we heading?

Science communication

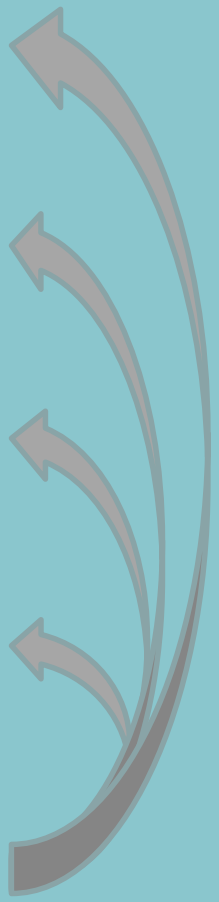
The need for marine protected areas

MPA policy and legislation

MPA establishment

MPA management

MPA reporting



Knowledge / Mātauranga

MPA policy and legislation

What should be the targets for MPAs?
What types of MPAs should be in the “toolbox”?
Are the objectives for MPAs measureable & achievable?

MPA establishment

How many? How big? What shape? How close?
What about representation of habitats and species?
What type of MPA should be used?

Collation and analysis of underlying data layers needed for MPA planning

Development of tools to support communities with conservation planning

MPA Management

How, when and what to monitor?

How do you know if the MPA is achieving its objectives?
How effective is the management of the MPA?
Is poaching an issue?
What would be the effects of poaching?
Are there any other activities in or around the MPA that are affecting its ability to achieve its objectives?

What are the key educational messages?
How can the MPA be used for research purposes?

MPA Reporting

What should be reported on?

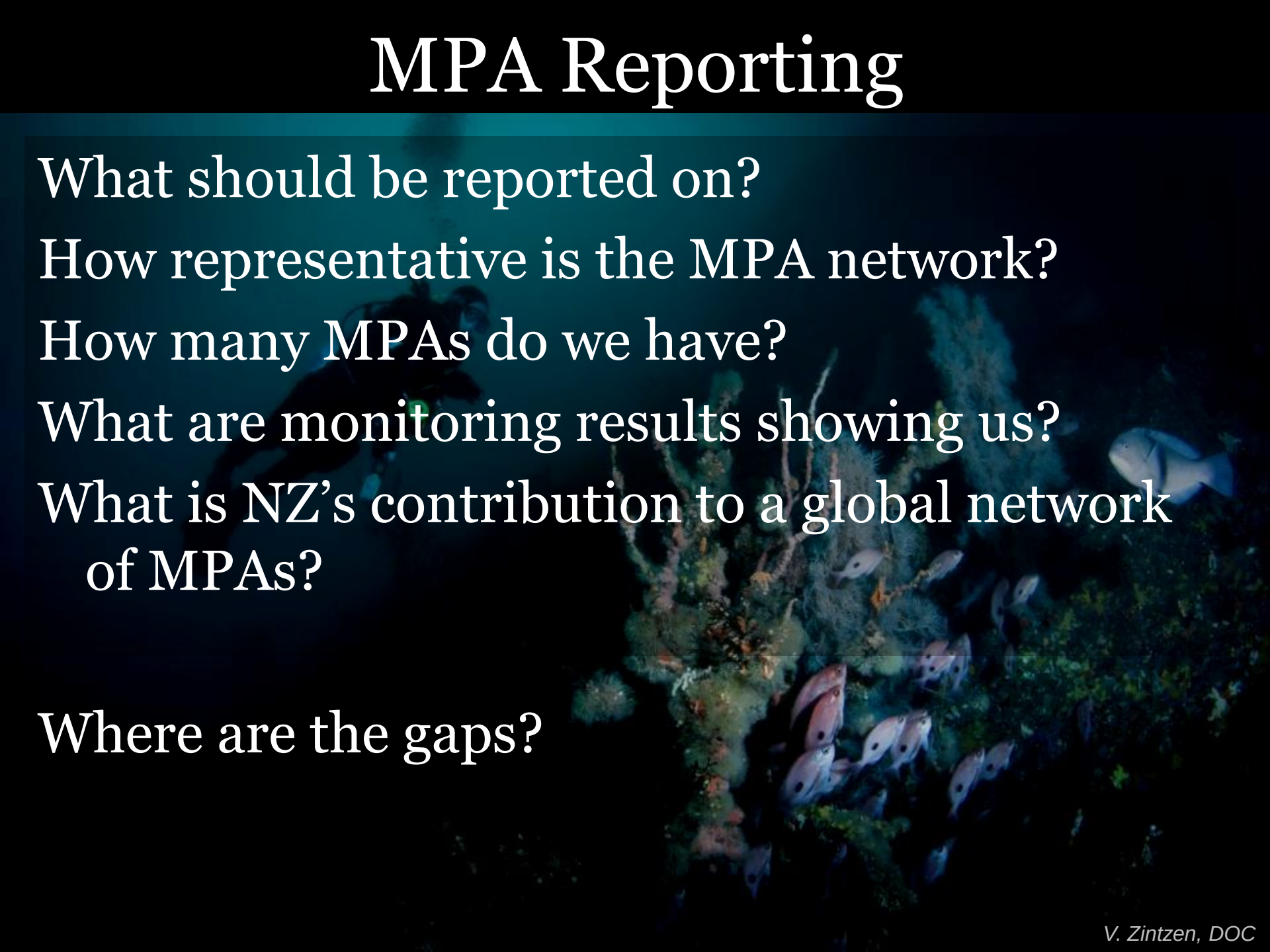
How representative is the MPA network?

How many MPAs do we have?

What are monitoring results showing us?

What is NZ's contribution to a global network of MPAs?

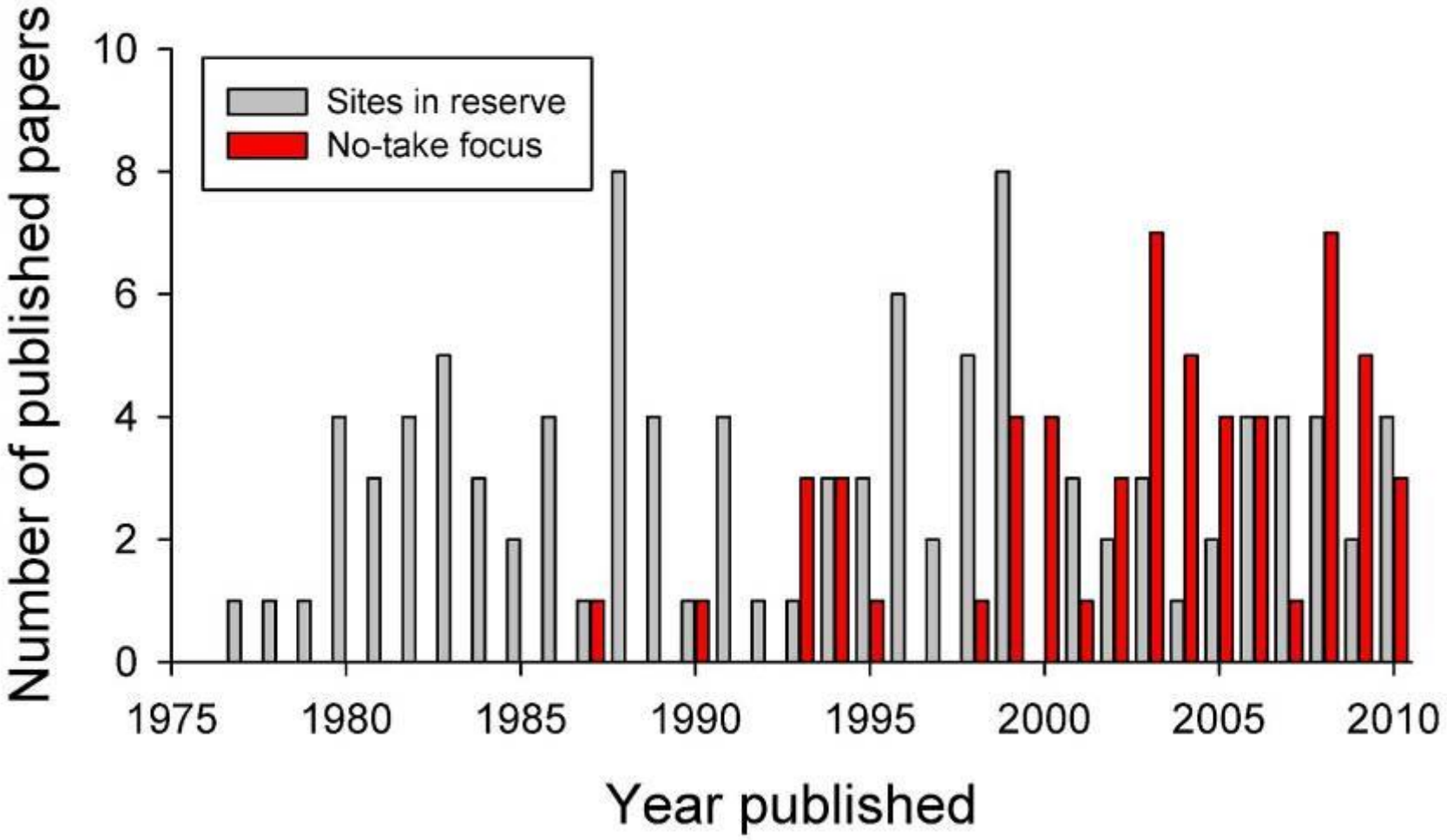
Where are the gaps?



V. Zintzen, DOC

What has been learned from NZ's marine protected area science?

Marine reserves as a place to do fundamental research



Willis (2013) The scientific and biodiversity values of marine reserves - a review
DOC Research & Development Series no.340 (available on DOC website)

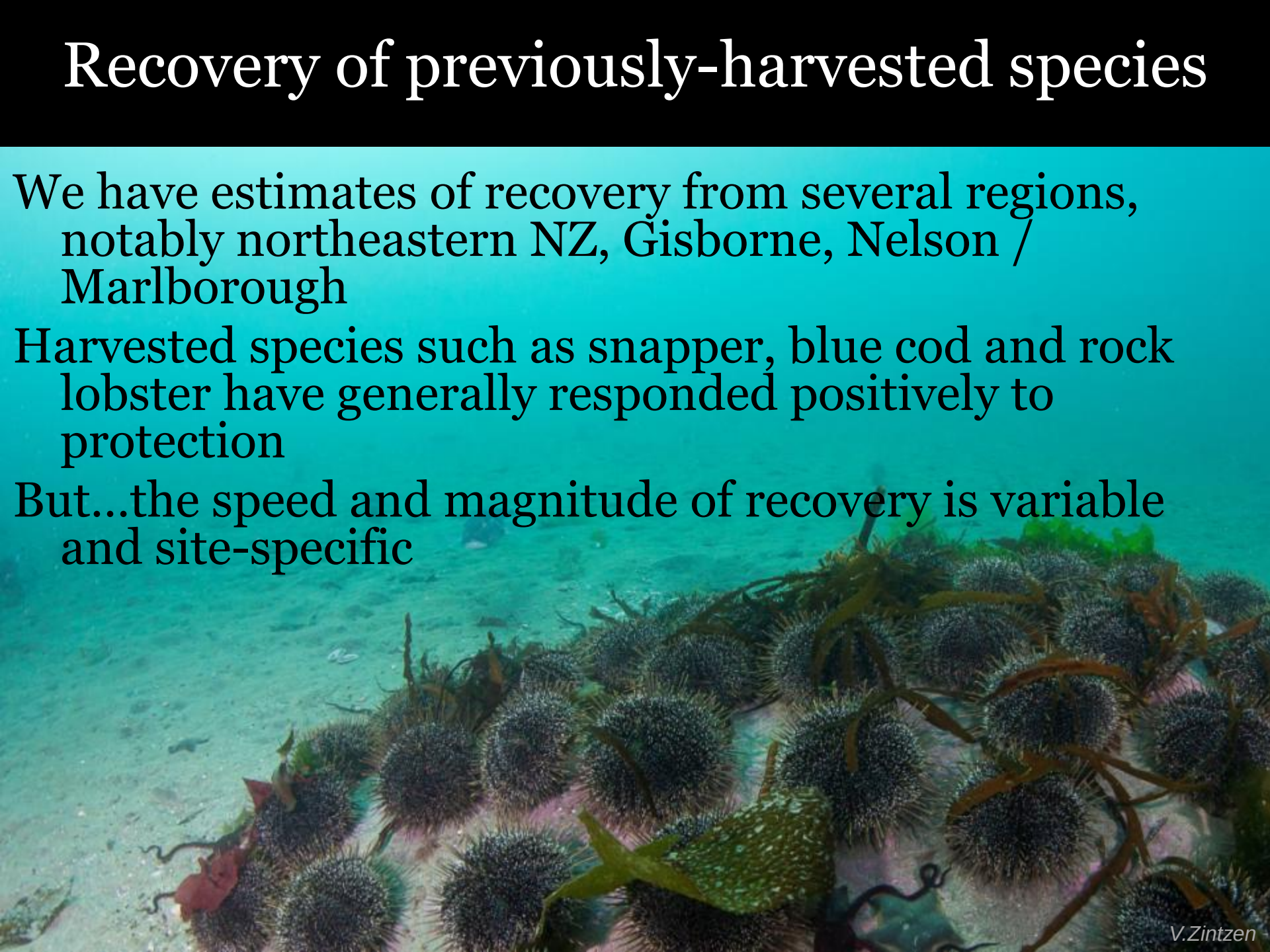
DAEDR

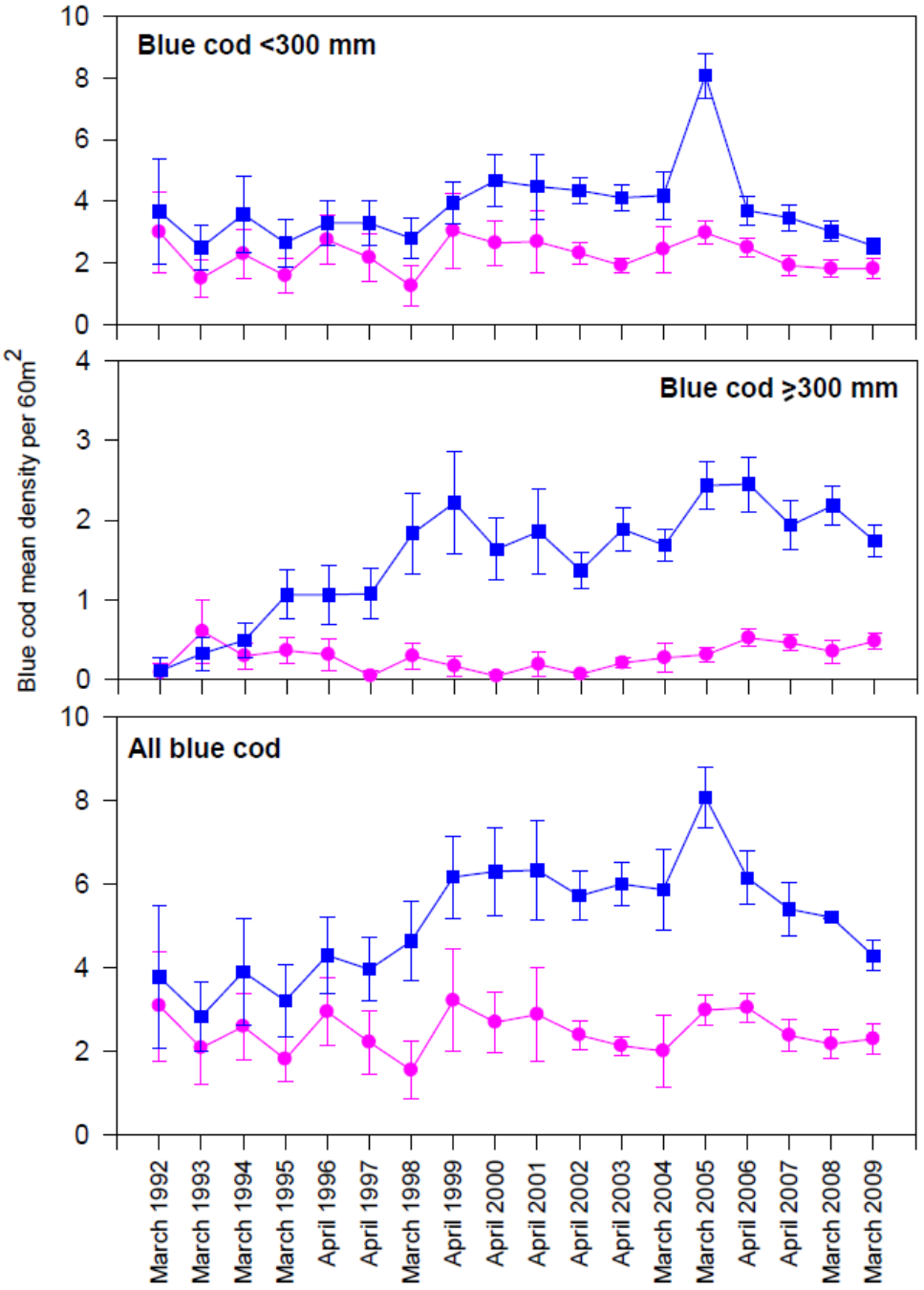
Recovery of previously-harvested species

We have estimates of recovery from several regions, notably northeastern NZ, Gisborne, Nelson / Marlborough

Harvested species such as snapper, blue cod and rock lobster have generally responded positively to protection

But…the speed and magnitude of recovery is variable and site-specific

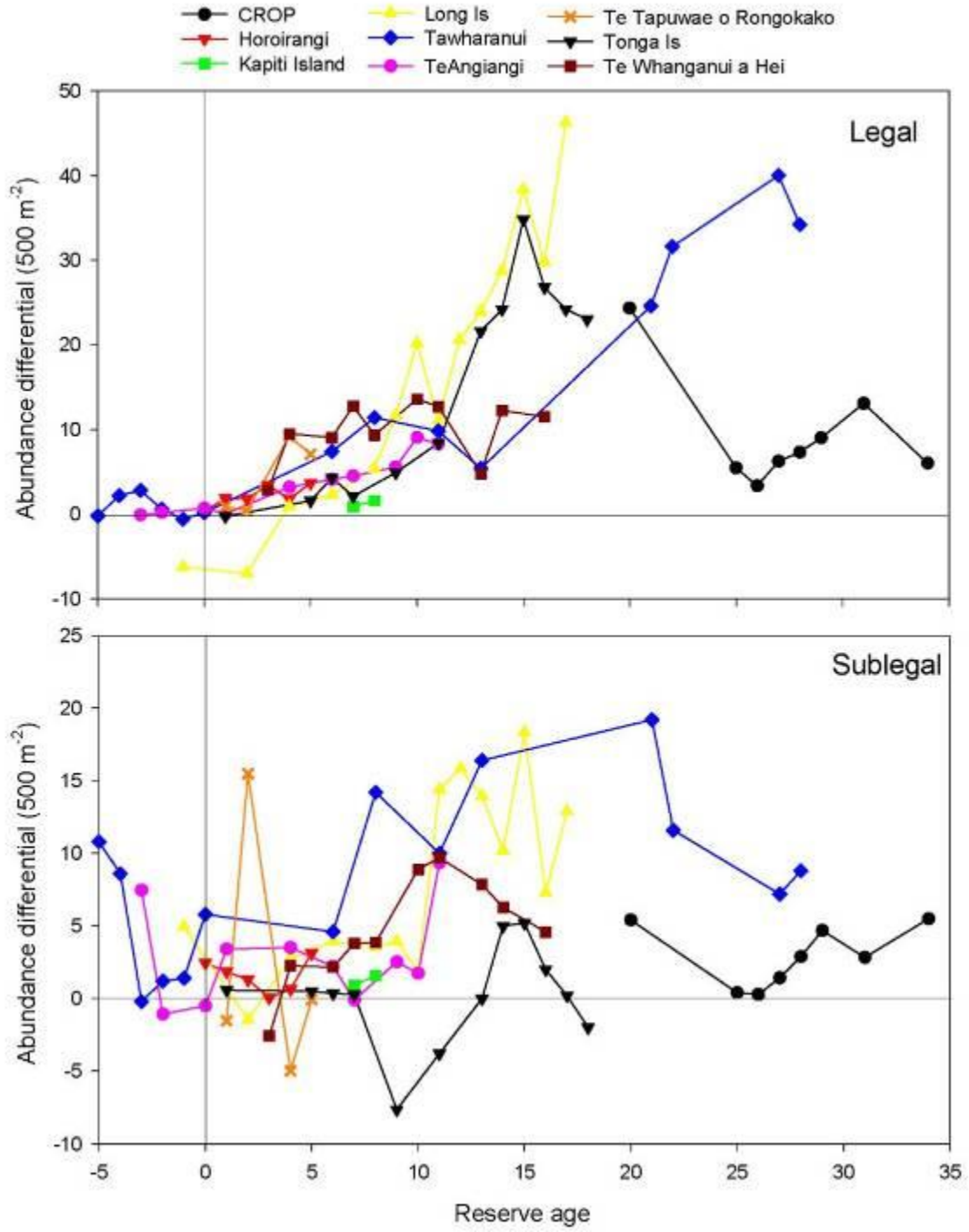




Blue cod, *Parapercis colias*

Long Island – Kokomohua Marine Reserve, Marlborough Sounds

Davidson et al. (2009)



Rock lobster, *Jasus edwardsii*

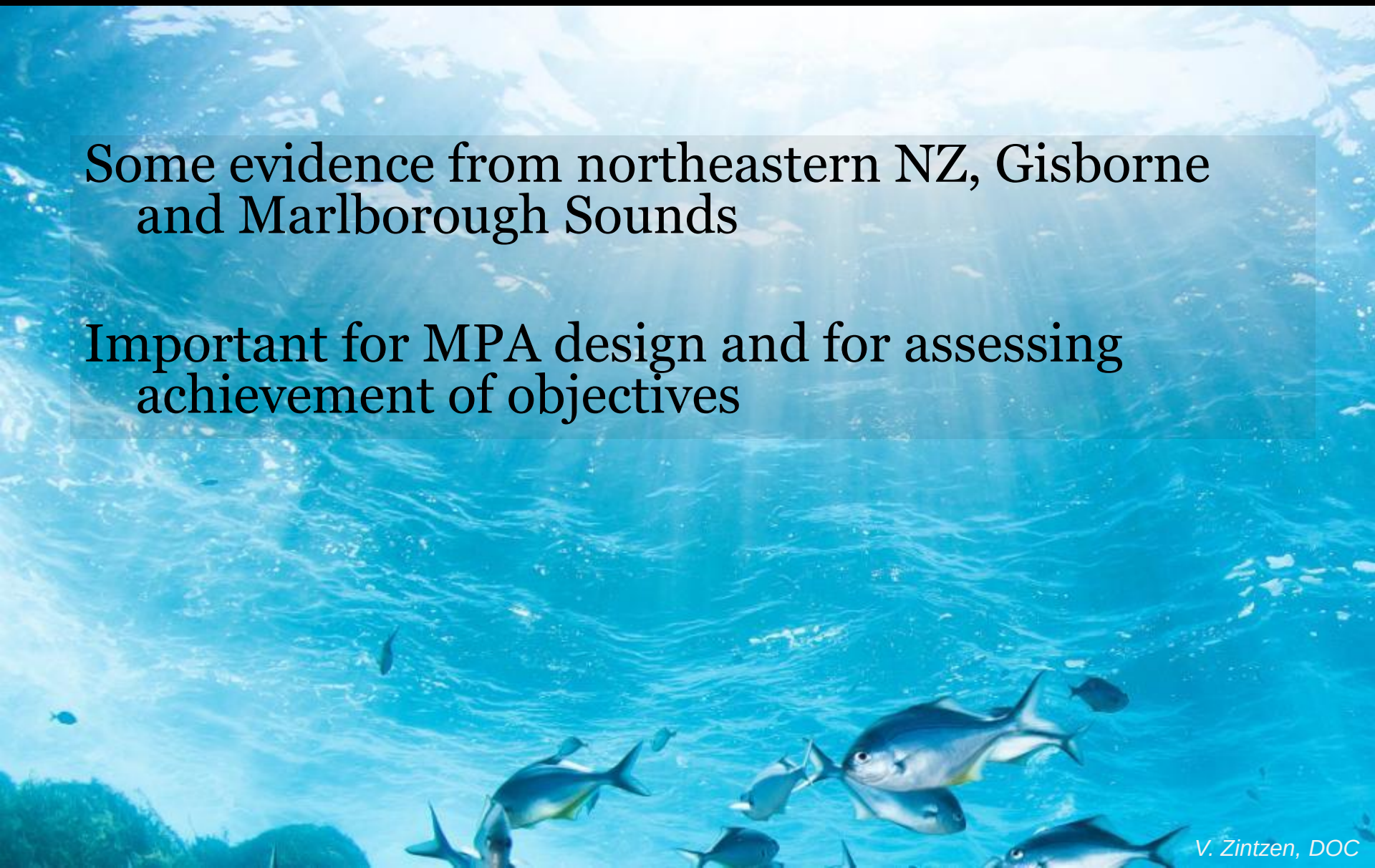
Difference in abundance between unfished and fished populations – 9 NZ marine reserves

Freeman et al. (2012)

Spillover / cross-boundary movement

Some evidence from northeastern NZ, Gisborne and Marlborough Sounds

Important for MPA design and for assessing achievement of objectives



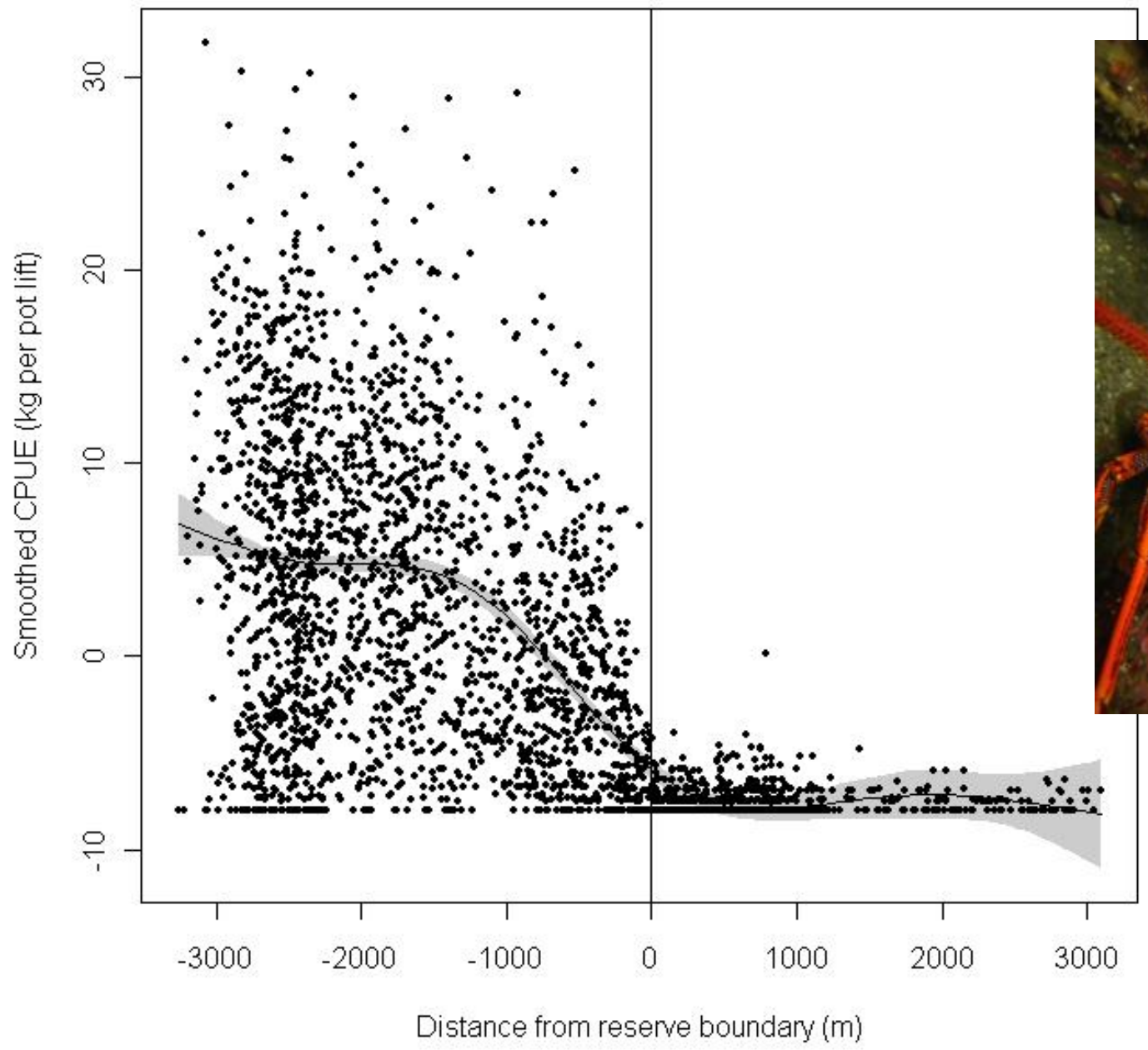
V. Zintzen, DOC

Te Tapuwae o Rongokako Marine Reserve – movement of tagged lobsters

178°10'E
178°15'E
38°35'S
38°35'S
178°10'E
178°15'E
Total distance travelled
< 1km
1 - 3km
> 3km
Reef
0
1
2 Km

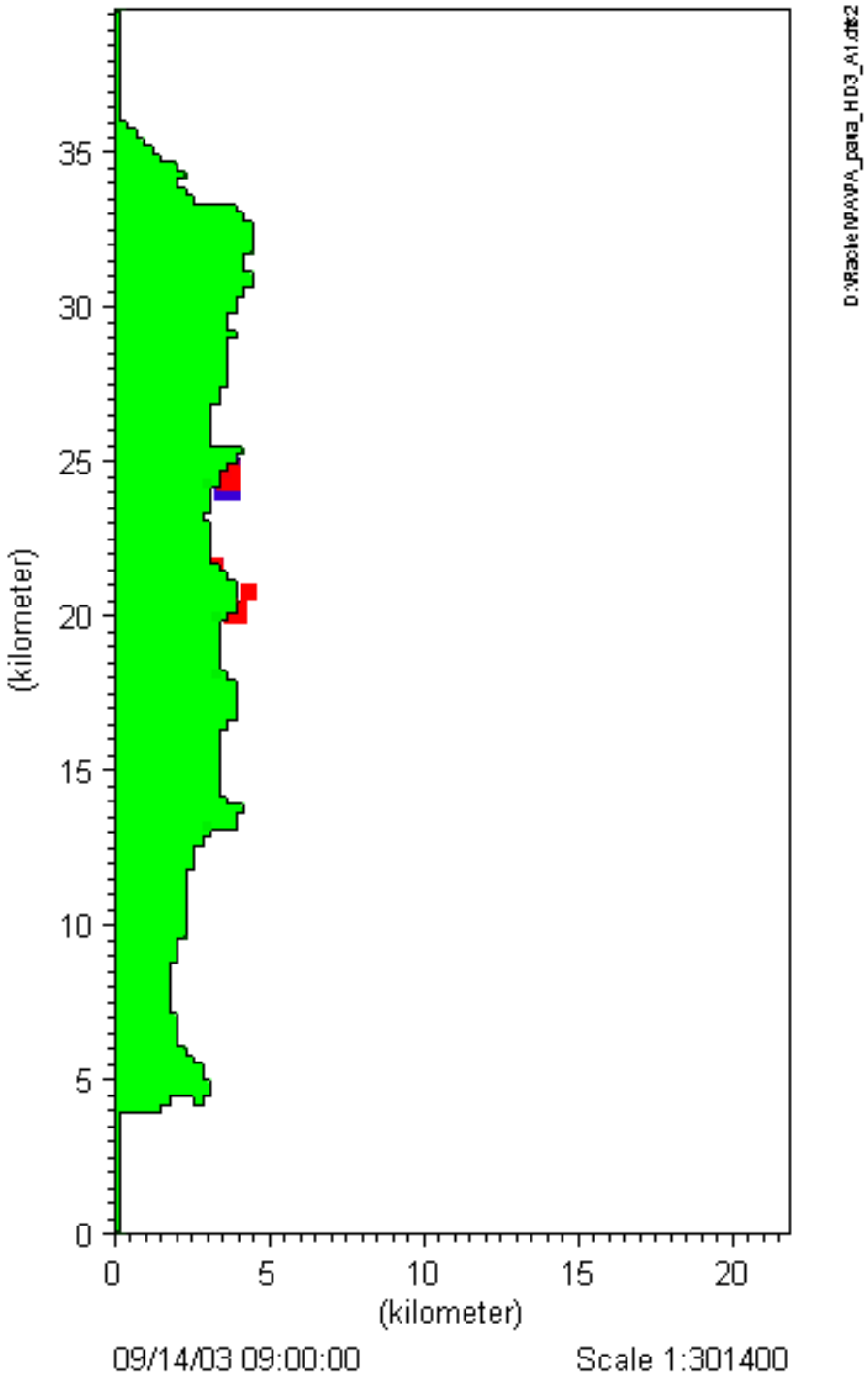
Freeman et al. (2009)

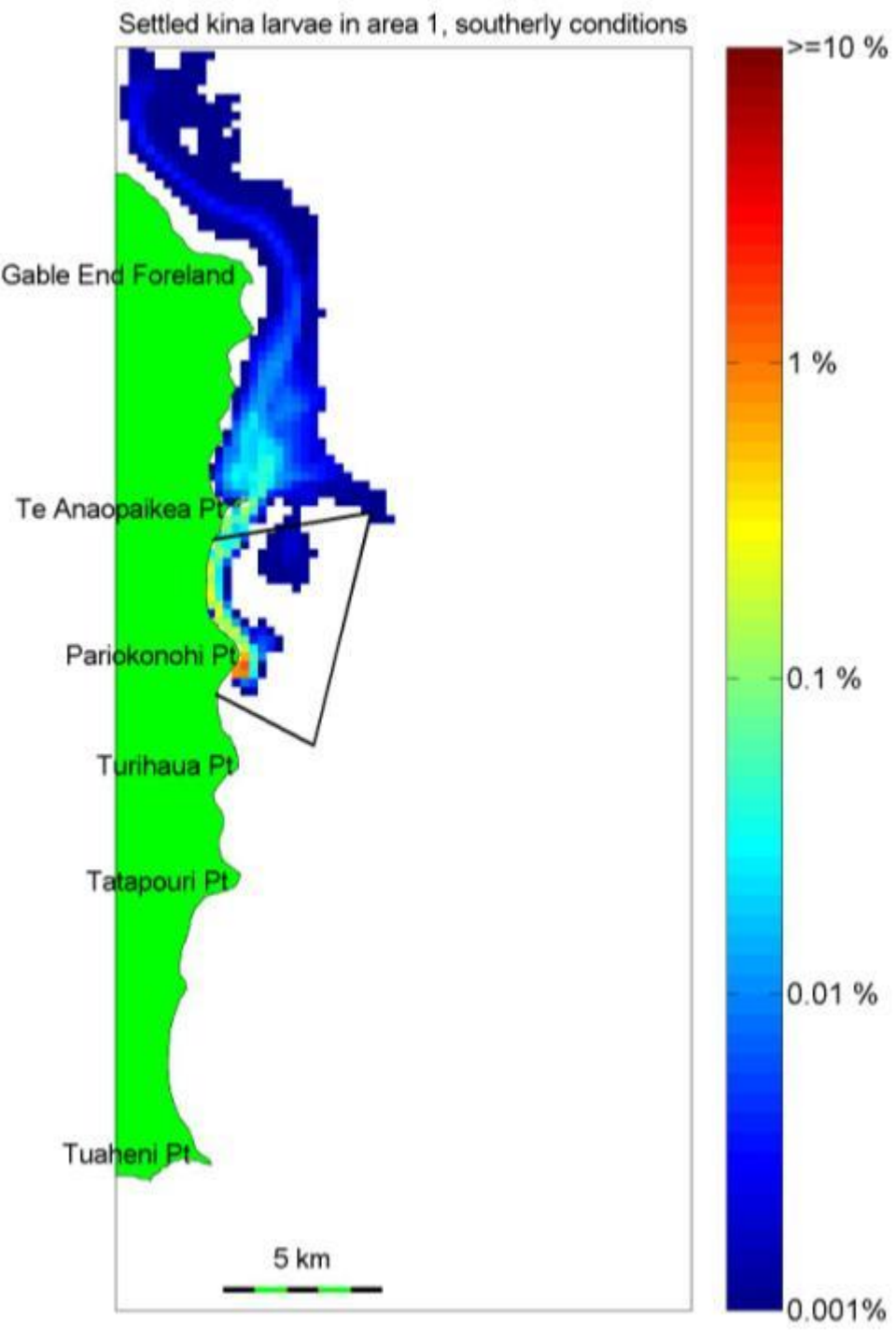
Lobster catches within and adjacent to Te Tapuwae o Rongokako Marine Reserve

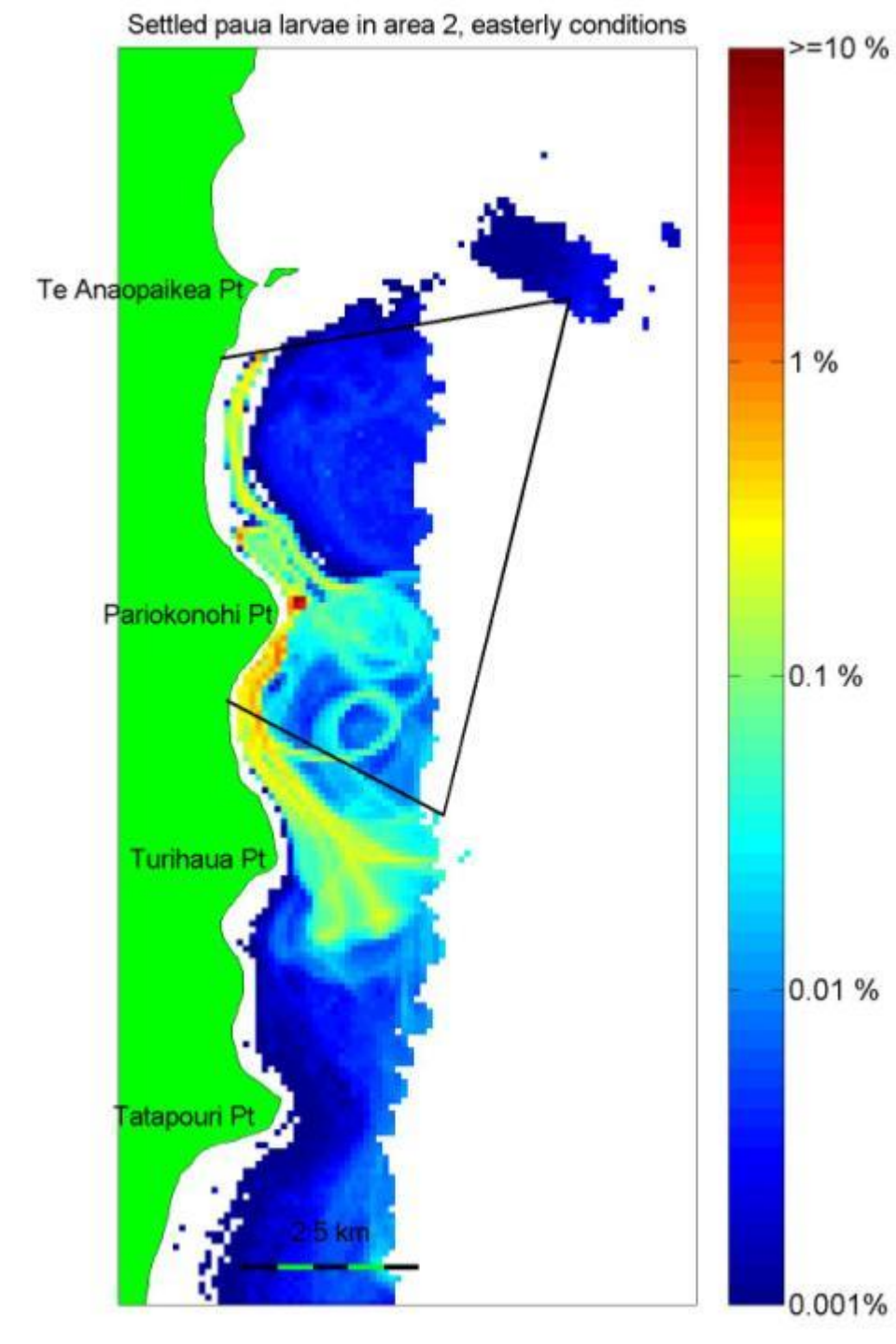


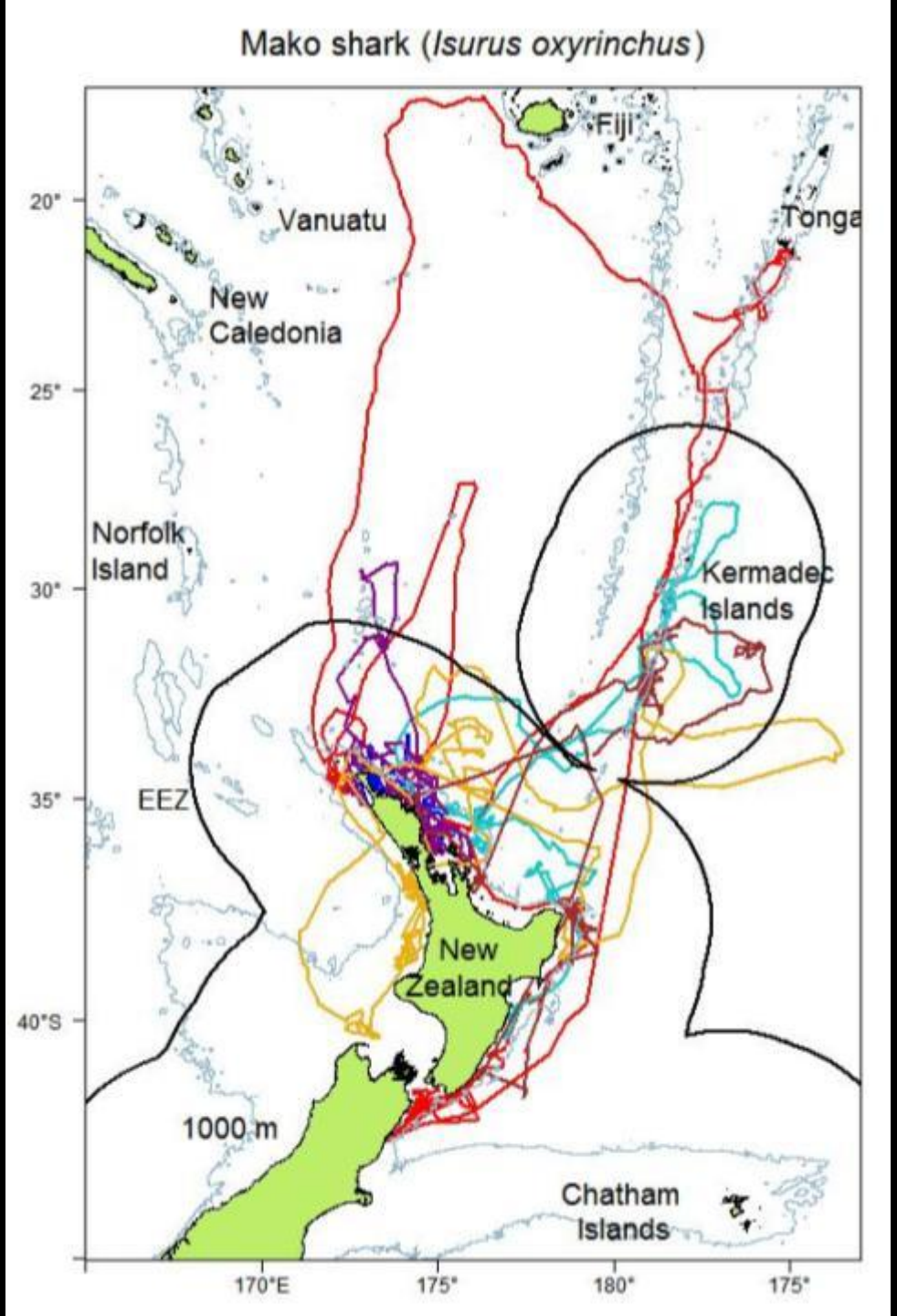
Freeman (unpubl.)

Pupu larval dispersal from Whangara



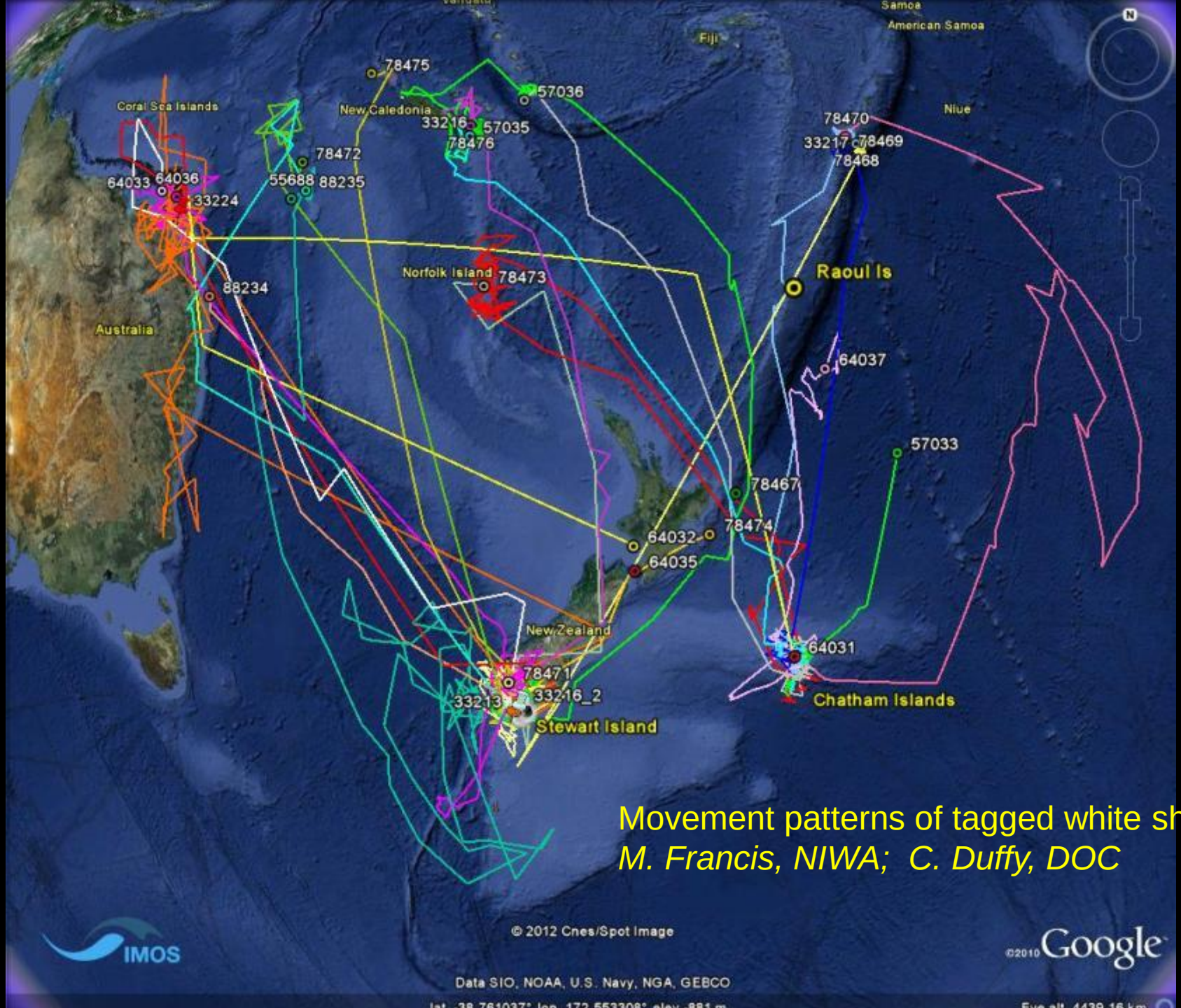

Settled kina larvae in area 1, southerly conditions
Gable End Foreland
Te Anaopaikea Pt
Pariokonohi Pt
Turihaua Pt
Tatapouri Pt
Tuaheni Pt
5 km
>=10 %
1 %
0.1 %
0.01 %
0.001%


Settled paua larvae in area 2, easterly conditions
Te Anaopaikea Pt
Pariokonohi Pt
Turihaua Pt
Tatapouri Pt
2.5 km
>=10 %
1 %
0.1 %
0.01 %
0.001%



Movement patterns of tagged mako sharks

Malcolm Francis, NIWA



Movement patterns of tagged white sharks

M. Francis, NIWA; C. Duffy, DOC

Food Webs

Recovery of predators has been linked to changes in reef and soft sediment communities through trophic ("food web") cascades

Development of trophic ("food web") models of NZ marine reserves – e.g. Te Tapuwae o Rongokako, Taputeranga

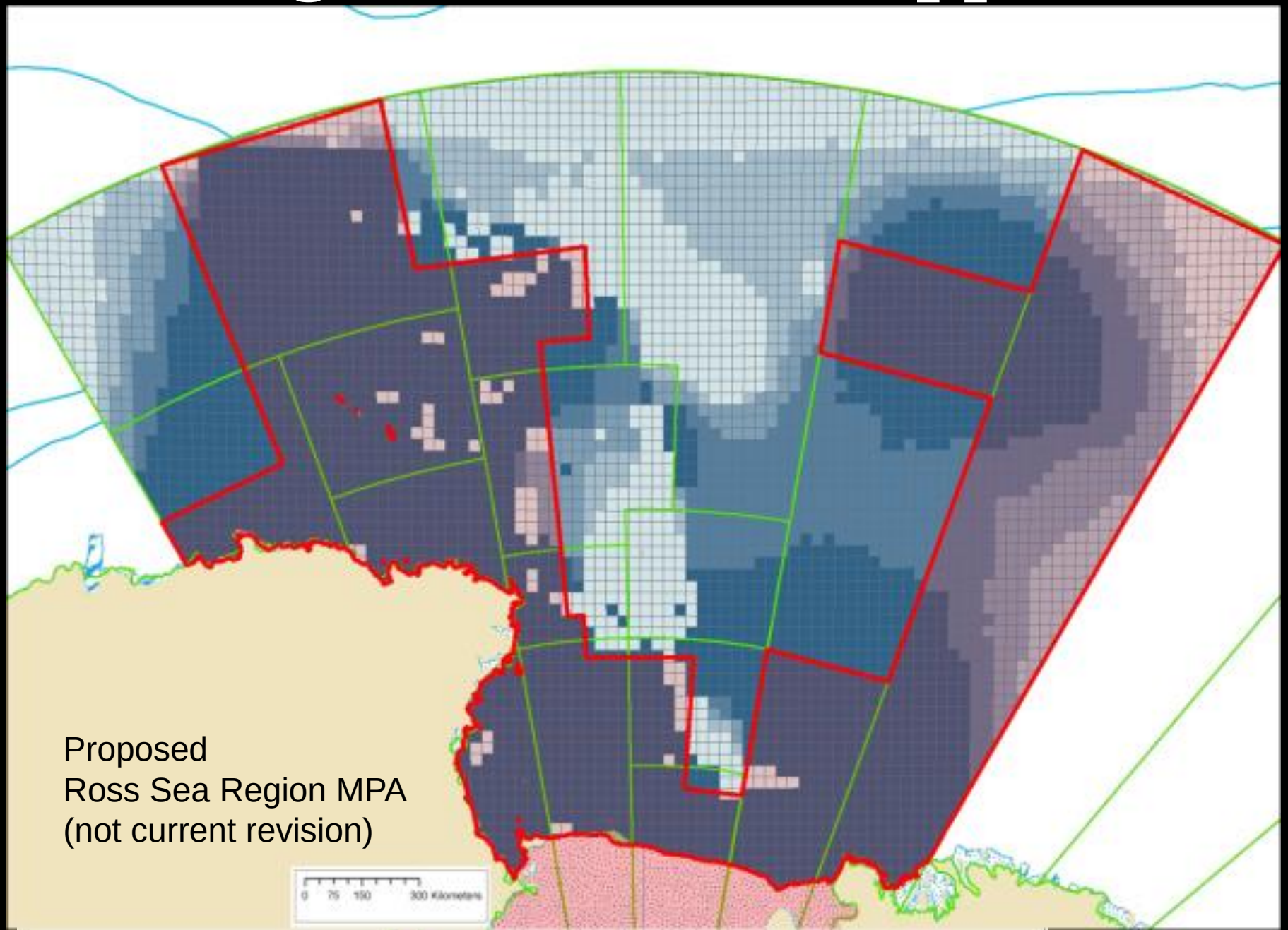
Effects of human activities

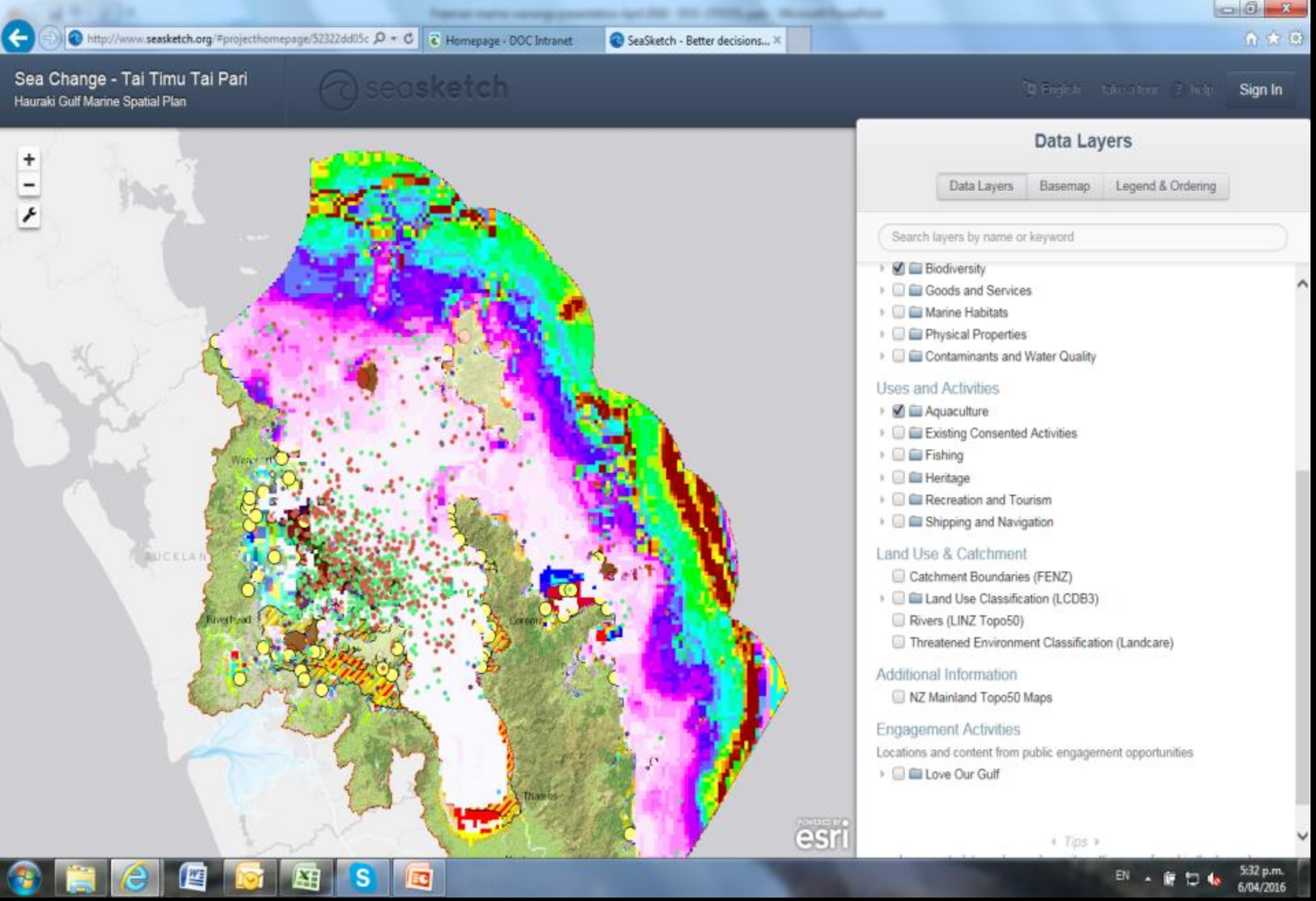
Marine reserves as reference points for environmental and fisheries management

e.g. Fishing mortality estimates for snapper,

Effects of fishing on growth and disease incidence in lobsters

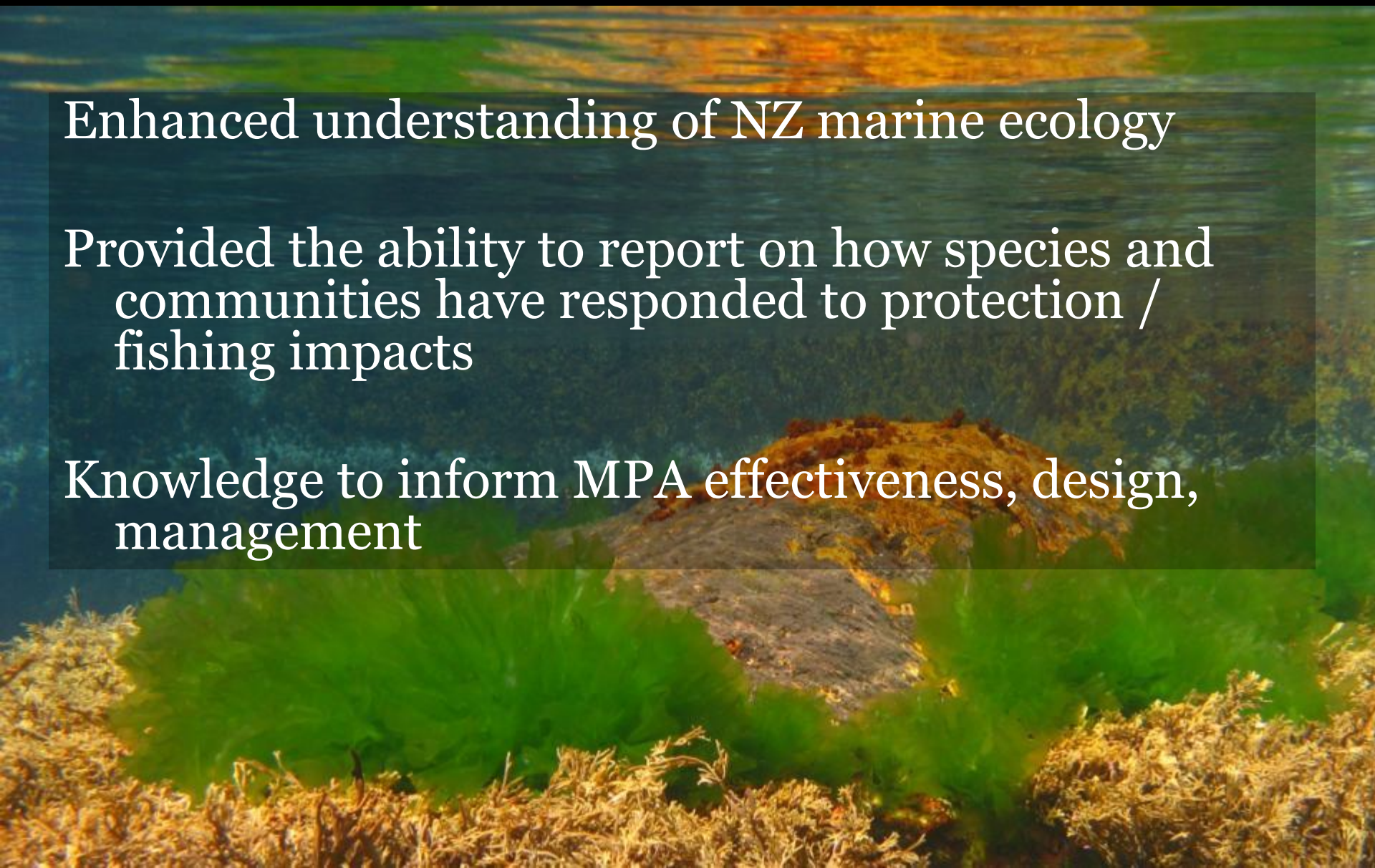
Planning and decision support tools





Hauraki Gulf – use of SeaSketch to help visualise marine information

Summary of research and monitoring



Enhanced understanding of NZ marine ecology

Provided the ability to report on how species and communities have responded to protection / fishing impacts

Knowledge to inform MPA effectiveness, design, management


Wade Doak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Moving ahead

Focus on ecological integrity – whole of ecosystem, from mountains to sea

Needs collective effort

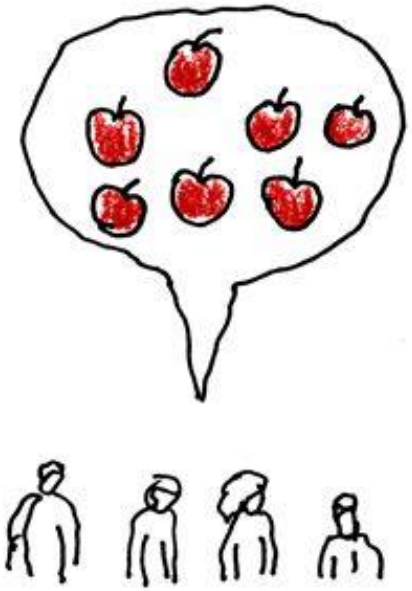
- MPAs only part of the solution

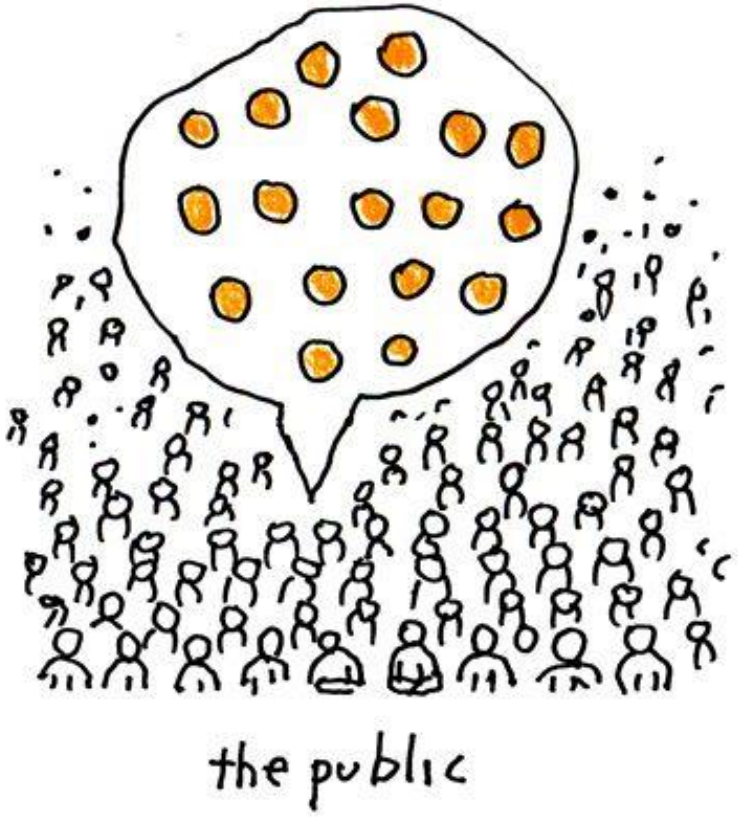
Incorporate mātauranga Maori

Engage citizen scientists

Use technology

Science communication





Conclusions from a 2005 workshop on the use of scientific information for MPA establishment and management

We need to think about the "promises" of MPA benefits and consequences of "broken promises".

Scientists should focus on undisputed benefits rather than on debatable benefits.

Expectations of increased productivity may explain a lot of support for MPAs.

There's a gap between what scientists recommend and what stakeholders are led to believe.

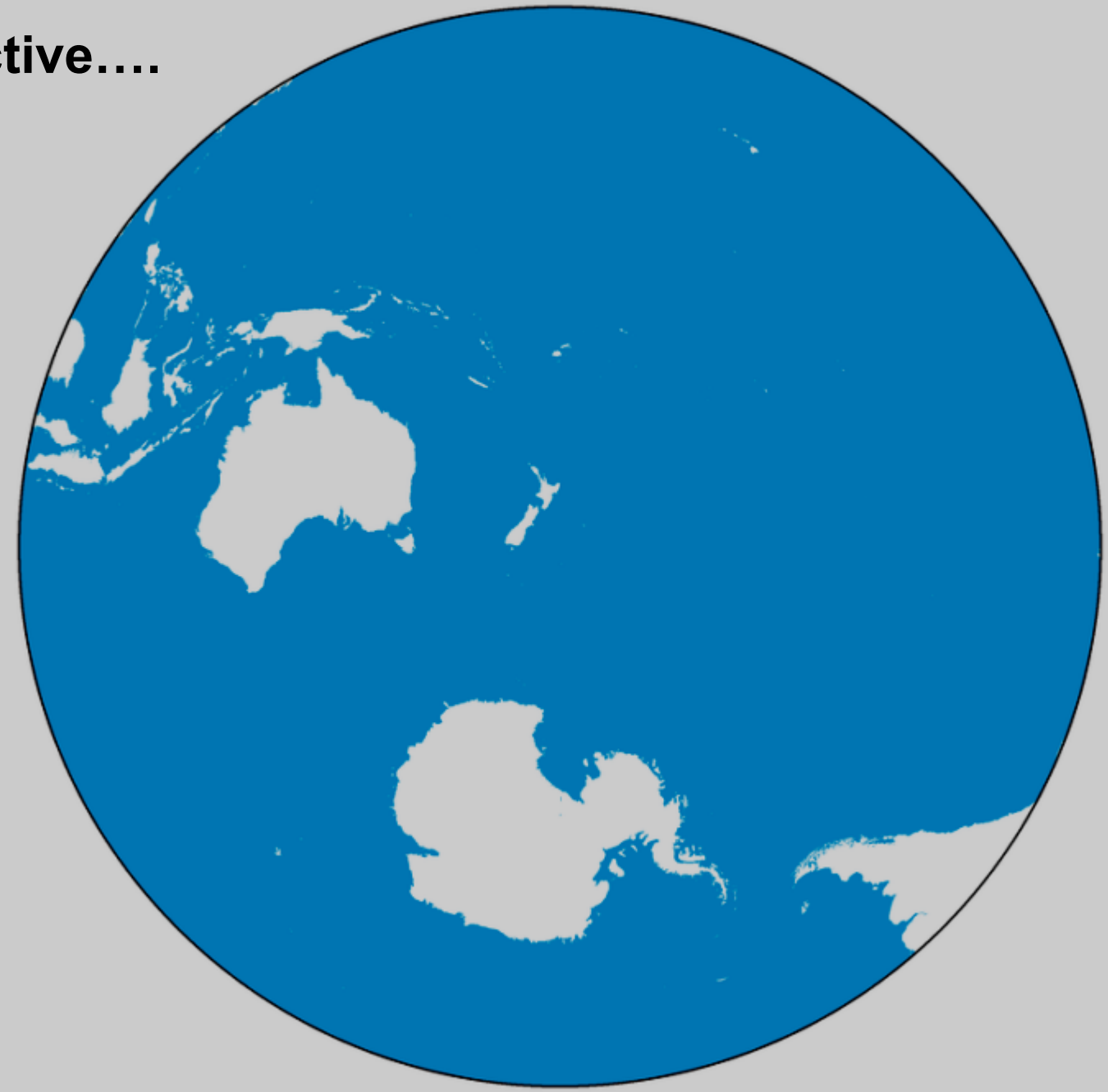
Is the "bar" higher for conservation science than for fisheries science?

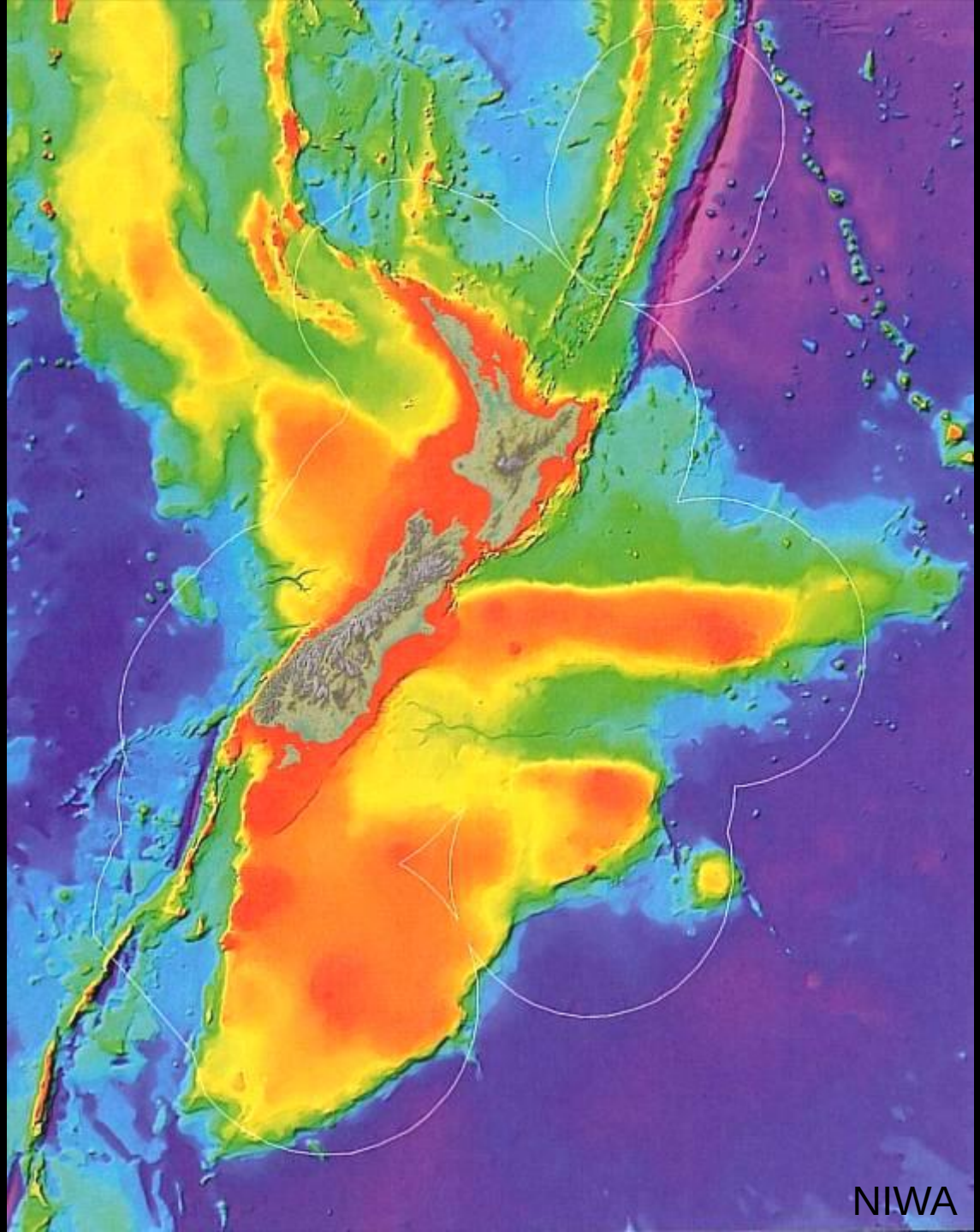
A cruise ship spotted on royal cam

Who is telling the story?

What about new New Zealanders?

Perspective….




NIWA

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NASA

Tena koutou

V. Zintzen, DOC