BIG OCEAN™

A Network of the World's Large-Scale Marine Managed Areas

NEWSFOCUS

Giant Marine Reserves Pose Vast Challenges

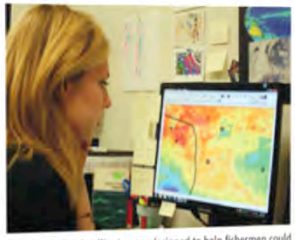
Huge no-fishing zones might save widely traveled tuna and other species, but monitoring their effectiveness—and enforcing catch bans—will require new approaches

HERNDON, VIRGINIA—On a typical workday, Alyson Kauffman pores over oceanographic data streaming into her computer from all over the world, including maps of plankton concentrations and water temperatures. Then, the analyst at GeoEye, a satellite company headquartered in this Washington, D.C., suburb, sends reports to her clients, who are fishing vessel captains at sea. Each report highlights otherwise invisible "hot spots" where they might find concentrations of valuable species such as tuna and swordfish. "Our job is to make fishing vessels more efficient," she says.

A growing number of those hot spots, however, are becoming off-limits to such high-tech fish killers. Over the past 6 years, the United States, Australia, and the United Kingdom have created huge marine reserves that have banned fishing in more than 1.9 million square kilometers of ocean—an area equivalent to the size of Mexico. And more "megareserves" are on the way, with nations seriously considering plans to ban fishing in an additional 3.6 million square kilometers of marine habitat over the next few years (see map).

Unlike an older generation of preserves that mostly focused on small patches of coral or coastal fish stocks, these vast new sanctuaries are designed to protect high-seas ecosystems that include fish and other animals that routinely wander over huge territories.

The trend delights conservation scientists who are worried about overexploitation of the world's oceans. The reserves "are a real game-changer," says fisheries scientist Daniel Pauly of the University of British Columbia, Vancouver, in Canada. Fishing fleets now have technology that allows them to penetrate even remote, deep waters that once "served as refuges for a lot of fish," he notes. "There's an urgent need to replace them with big, manmade protected areas."



Eye in the sky. Satellite images designed to help fishermen could also be used to spot poachers.

CREDITS: CHRISTOPHER PALA/SCIENCE

No go. New reserves are off limits to commercial fishing boats, such as this tuna seiner in Micronesia.

Giant reserves are also posing unprecedented challenges to scientists and policymakers, however. Researchers are struggling to design and fund studies that will enable them to monitor changes over vast areas and determine whether the reserves are actually helping to rebuild marine populations. And managers are trying to figure out how they can affordably enforce fishing bans in remote waters. Some environmentalists, meanwhile, fear that the push to create megareserves could become a charade if nations are allowed take credit for conservation without actually giving the new sanctuaries real protection.

The big three

Three giant reserves have so far attracted most of the attention. In 2006, then-President George W. Bush designated some 362,000 square kilometers around the Northwestern Hawaiian Islands as a U.S. Marine National Monument in which all exploitation would be banned. The United Kingdom followed in 2010 by creating a much bigger reserve around the Chagos Islands in the Indian Ocean. Last year, Australia banned all fishing in much of the Coral Sea—at 989,842 square kilometers, the biggest no-take zone in the world.

Of the trio, only the Chagos Islands reserve had been heavily fished—primarily for tuna. Most of those stocks are now depleted, and conservationists hope the sanctuary will help restore them. But commercial fishers—who largely opposed the creation of the reserve—have their doubts. Speedy tuna can travel great distances, notes Julio Moron of OPAGAC, the Spanish tuna fleet association headquartered in Madrid, so even a megareserve will have "have negligible effects on the pelagic [open-ocean] ecosystem," he predicts.

Mainstream marine biologists are more optimistic. Studies in the nearby Pacific have found that tuna there don't necessarily swim vast distances, so some scientists believe that some Chagos tuna could spend their entire lives inside the nearly 1000-kilometer-wide preserve. "Tuna don't migrate randomly," says Heather Koldewey, a geneticist at the Zoological Society of London. "They stay near seamounts, islands, upwellings, and good feeding grounds—and the Chagos provide all these." Bruce Collette, a senior scientist at the Smithsonian Institution's National

nature International weekly journal of science

Published online 16 May 2011 | Nature | doi:10.1038/news.2011.292

News

Marine protection goes large

As the creation of giant reserves gains momentum, some fear such areas don't always conserve the habitats most in need.

Nicola Jones

Huge marine reserves are cheaper to run and more effective at conserving species than small ones. *NOAA*

The past five years has seen a spurt in the creation of giant marine protection areas, including a 320,000 km^{2}marine reserve announced earlier this month in Australia.

"Now we have a competition for politicians to see who can have the biggest one," said Daniel Pauly of the University of British Columbia in Vancouver, Canada, at the start of the Society for Conservation Biology's 2nd International Marine Conservation Congress in Victoria, Canada, on Saturday.

The trend has put smiles on the faces of conservationists, who say that large reserves are the fastest way to bulk up protected areas, and are cheaper to manage per unit area than smaller ones to boot. But they add that there is still a long way to go to achieve current targets, and caution that the most recent reserve has protected the "wrong" parts of the ocean.

Ocean grab

The rush to create giant conservation areas was started by former US president George W. Bush, who created the record-breaking

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Protecting nature. Preserving life.

Cool Green Science

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New Study: Marine Protection Goals Are on Target, But Still Not Enough

APRIL 11, 2013 | by: Darci Palmquist | 1

Visitor snorkeling over coral reef in a marine protected area (MPA) of Kimbe Bay, Papua New Guinea. Photo © Mark Godfrey

According to a new report led by Nature Conservancy scientists and policy experts, the number of marine protected areas (MPAs) has increased fivefold in the last 10 years and the world is actually on track to meet its goal of protecting 10% of the oceans by 2020.

Sounds like something to shout from the rooftops, right? Not quite, say the authors. Instead, they want the marine conservation community to see this as an opportunity for reassessment: A call-to-action to step up and look beyond the numbers.

"It's certainly progress and we should celebrate that," says **Mark Spalding**, a Conservancy marine scientist and lead author on the report. "But there's a lot of nuance behind these targets. More than that, is 10% really what we should be fixated on?"

The **study** – developed in conjunction with the **UNEP World Conservation Monitoring Centre** and published in the *Ocean Yearbook* – assessed the state of ocean protection efforts to date and provides recommendations for how to achieve real success for the future. The authors reviewed 10,280 MPAs, covering 8.3 million square kilometers or 2.3% of the world's ocean area, and found:

- A small number of large MPAs are responsible for much of the global growth: The 20 largest MPAs account for 60% of the entire global MPA coverage, with an increasing trend to cover remote and off shore areas.

Authors

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- Eddie Game
- Jon Fisher
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- Mark Spalding
- Matt Miller
- Peter Kareiva
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- Sally Palmer
- Sophie Parker
- Stephanie Wear
- Timothy Boucher
- Vera Agostini

What is Cool Green Science?

Most projections say at least 9 billion people will be alive on Earth come 2050 -- putting tremendous pressures on the natural systems that we all rely on for survival and prosperity.

Cool Green Science is where Nature Conservancy scientists and science writers discuss and debate how conservation can help meet those challenges head on -- in partnership with you, of course. You'll also find photos, videos and dispatches from our fieldwork, book reviews, raves and groans about new research, natural history accounts, citizen science opps, and much much more -- including stuff about critters that are just cool.

Cool Green Science is managed by **Matt Miller**, senior science writer for the Conservancy, and edited by **Bob Lalasz**, its director of science communications. Email us your feedback.

Editors' Choice

Matt Miller: Big Fish: Return of the Alligator gar
Alligator gars were persecuted and eliminated for crimes they didn't commit. A new conservation effort is bringing them back.

SUPPORTERS

" The 20 largest MPAs account for 60% of the entire global MPA coverage, with an increasing trend to cover remote and off shore areas."

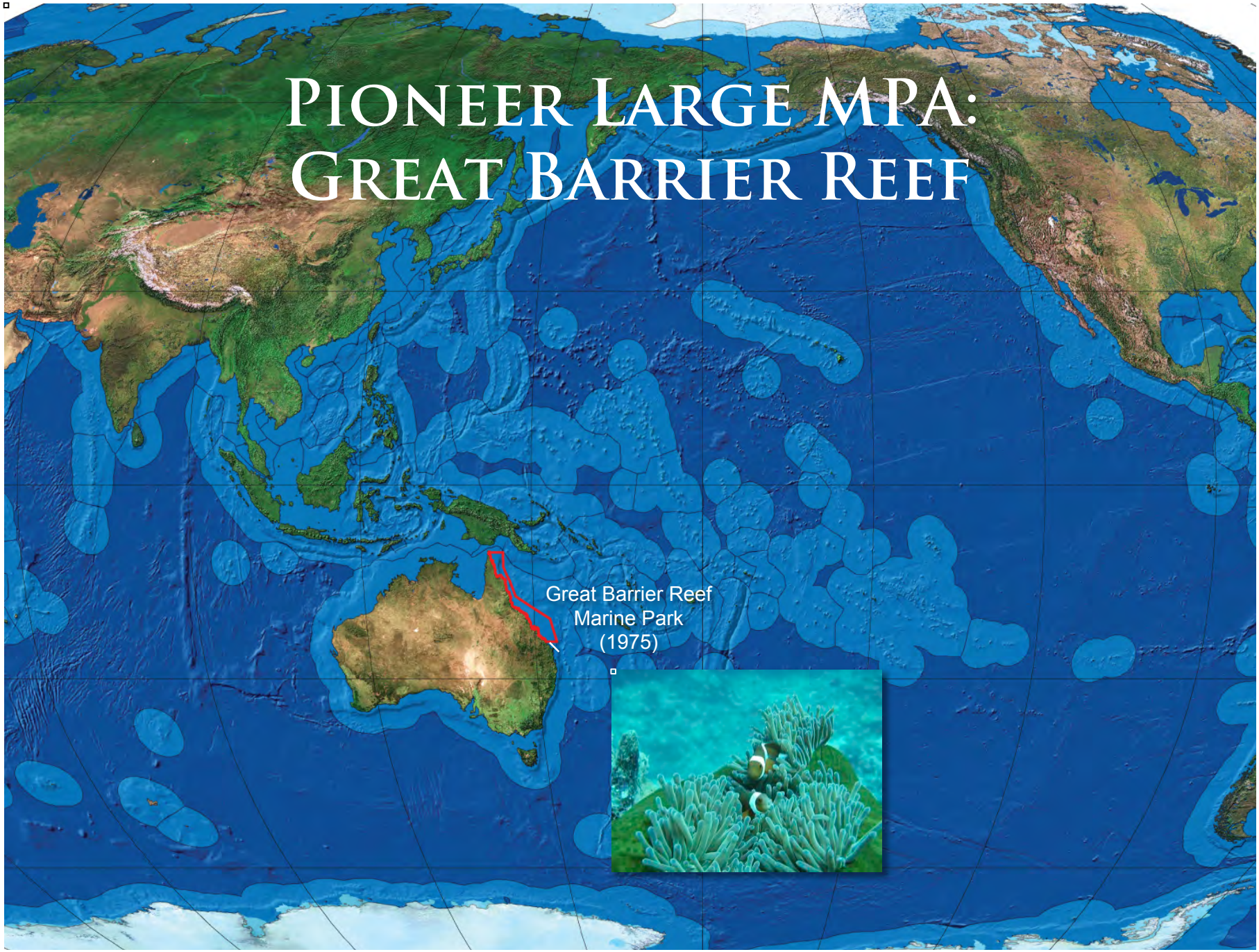
Detractors

"Most of the largest MPAs are established by opportunity – a flagrant example of 'a solution desperately seeking a problem'."

Presentation Outline

- Introduction on Large-Scale MPAs
- Big Ocean Purpose and Activities
- Unique Challenges of Large-Scale MPAs
- Continuing Trends and Interest
- Benefits & Opportunities for Large-Scale MPAs
- 2013-2014 Priorities

Pioneer Large MPA: Great Barrier Reef



- > 2,000 km long (extends over 14º of latitude)
- GBRMP - Low water mark seawards
- 344,400 sq km
- Federal jurisdiction (but jointly managed)
- Multiple-use World Heritage Area

First Fully Remote Large Marine Protected Area

Papahānaumokuākea
Marine National Monument
(2000/2006)

PAPAHĀNAUMOKUĀKEA
Marine National Monument & World Heritage Site

Most remote ¾ of the most remote island chain in the world—the Hawaiian Archipelago.

Includes marine and terrestrial features.

Far from populated islands.

PAPAHĀNAUMOKUĀKEA
Marine National Monument & World Heritage Site

"Our Sea of Islands": A Regional Forum

Honolulu, Hawai'i

PAPAHĀNAUMOKUĀKEA
Marine National Monument & World Heritage Site

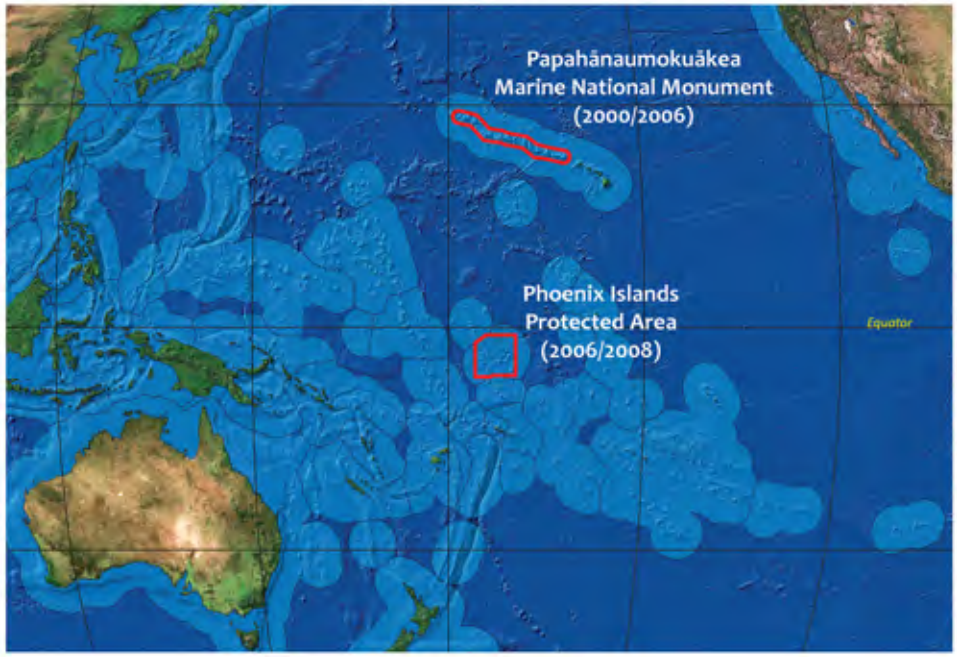
Primary Outcome

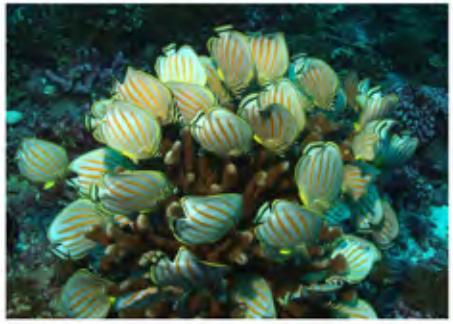
- International Communique':
  - Strengthen Traditional Knowledge, local management, and customary rights and practices
  - Drive science and management according to local/regional needs and incorporate local knowledge
  - Build indigenous capacity
  - Foster peer learning exchanges across Oceania
  - Build support for Pacific MMAs
  - Support World Heritage; promote global recognition of cultural seascapes

Papahānaumokuākea Marine National Monument

SISTER~SITES

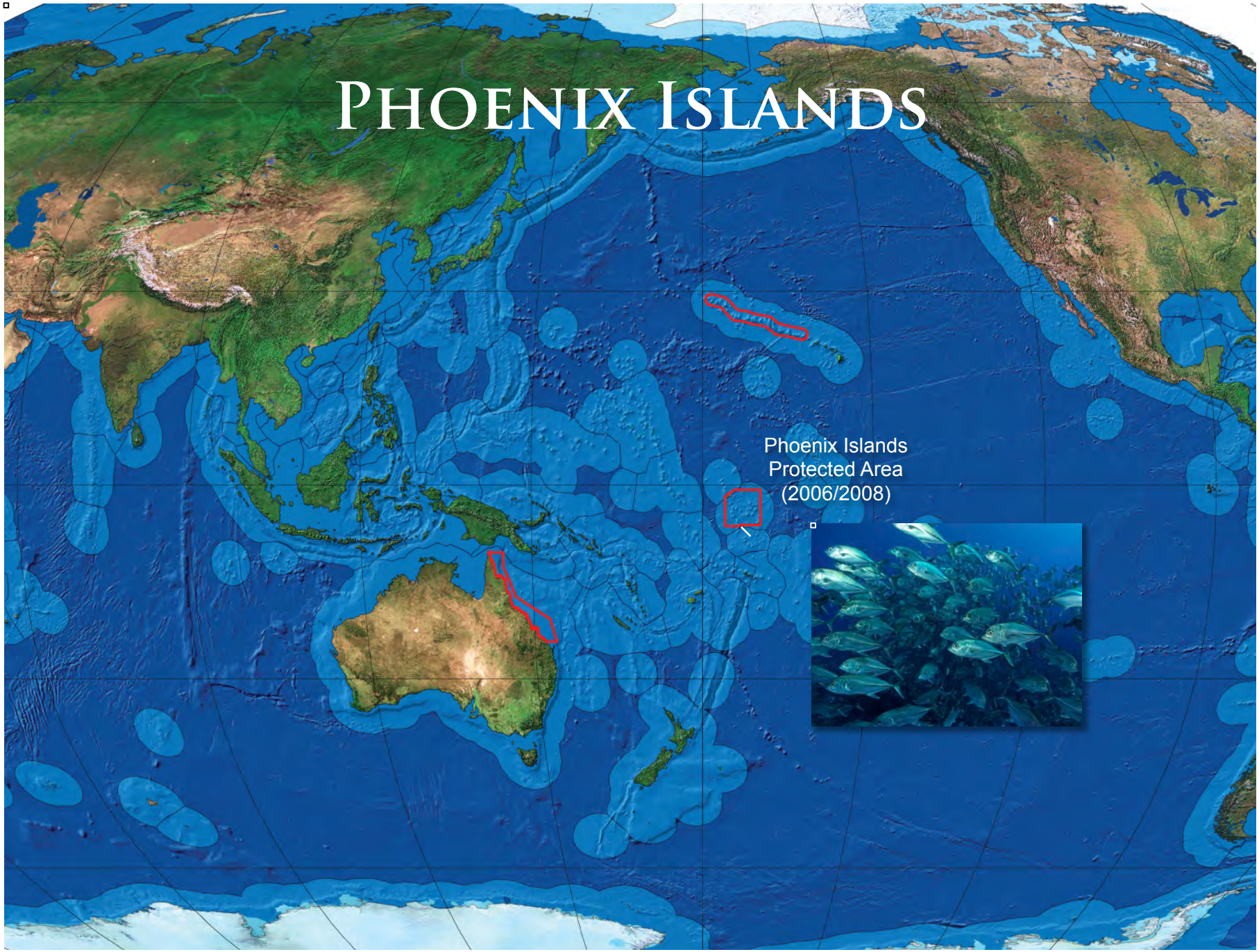
Papahānaumokuākea & Phoenix Islands Protected Area

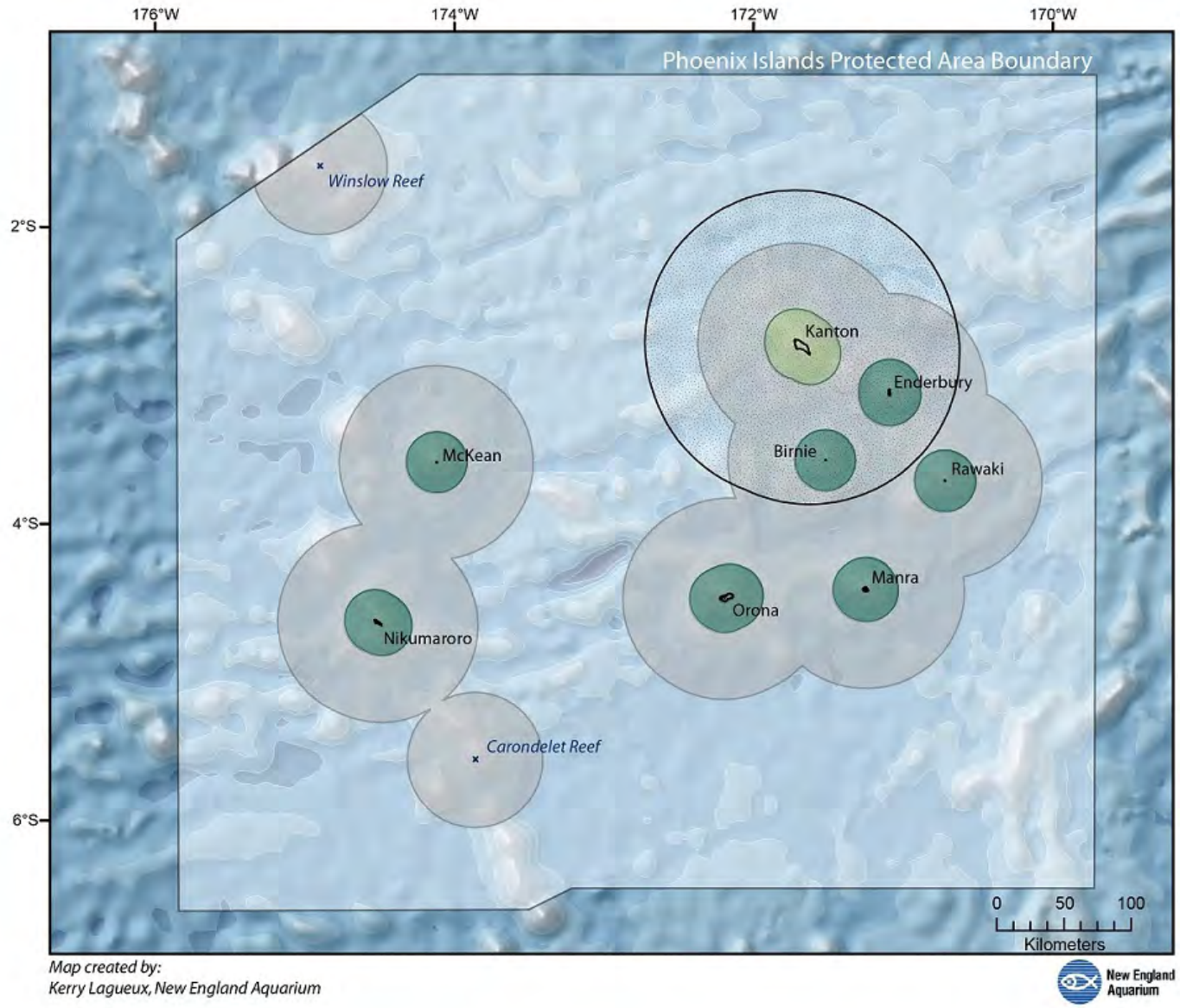




PAPAHĀNAUMOKUĀKEA
Marine National Monument

Phoenix Islands





Map created by:
Kerry Lagueux, New England Aquarium

New England Aquarium

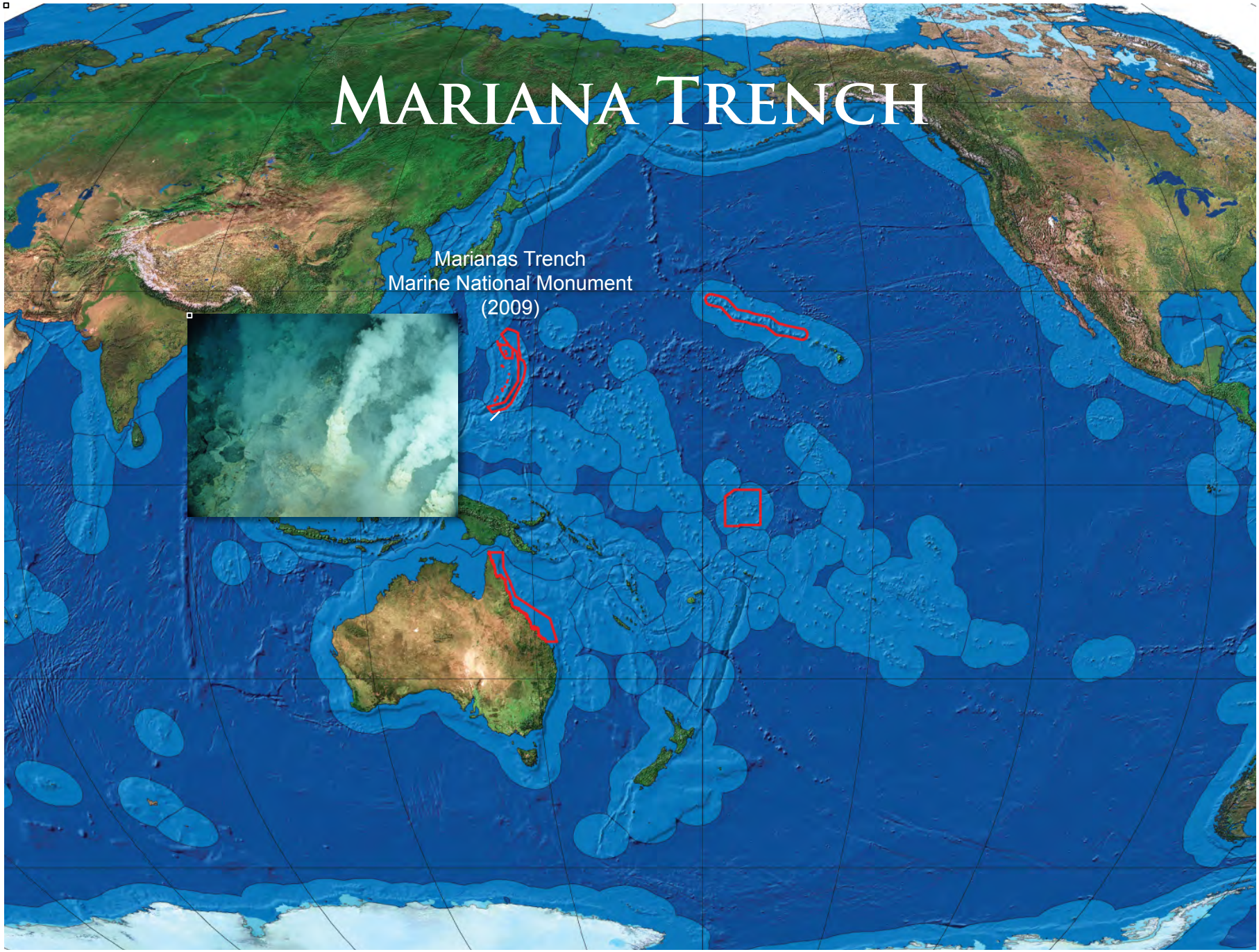
Phoenix Islands Protected Area Phase 2 *Proposed*

Legend

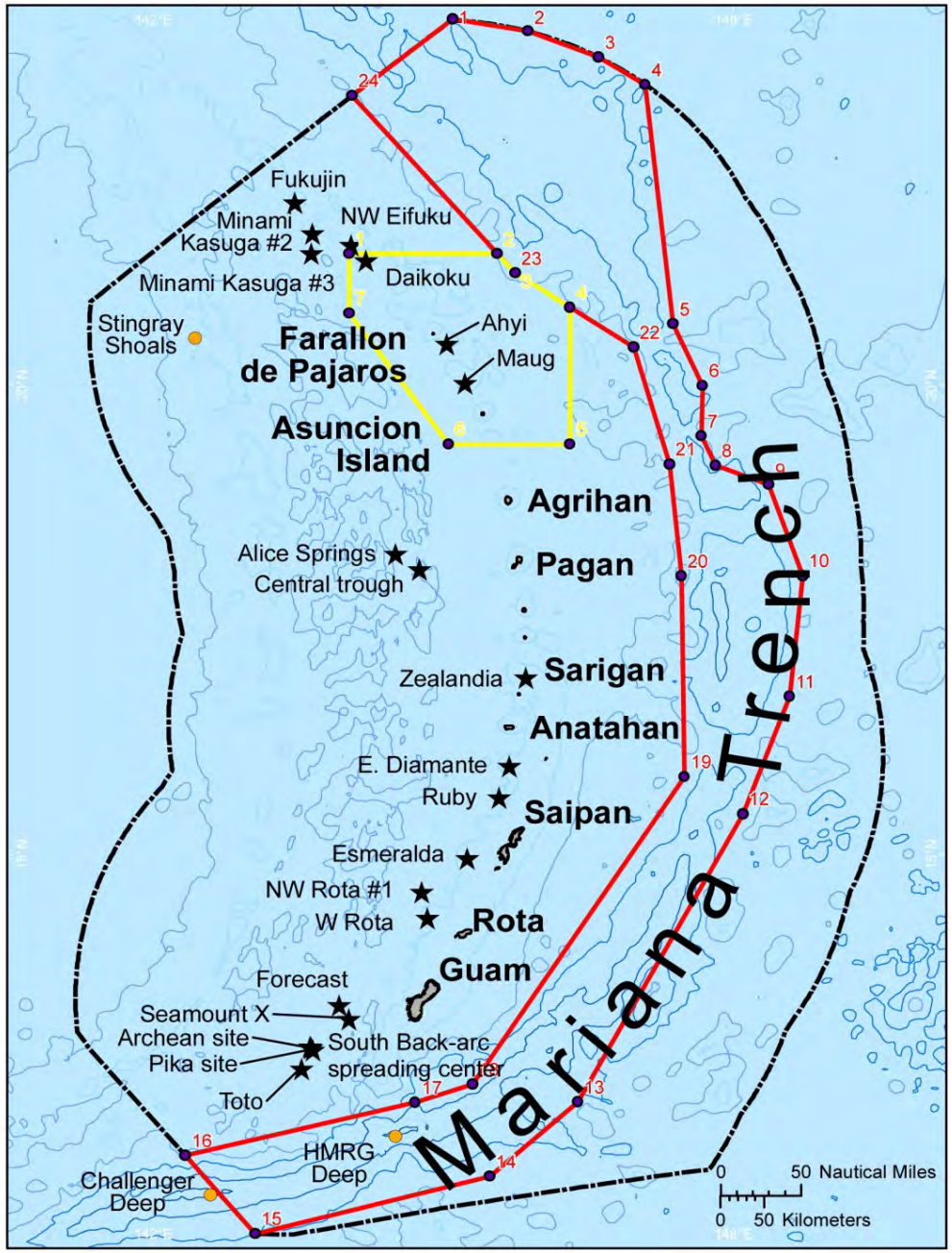
- **No Take Zone** (12,714 km^2 or 3.1%)
- **Kanton Restricted Use Zone** (2,495 km^2 or 0.6%)
- **Kanton Purse Seine Exclusion Zone** (37,197 km^2 or 9.1%)
- **Phase 2 increase in No Take Zone** (102,063 km^2 or 25%)

MPA total area: 408,250 km^2

Mariana Trench

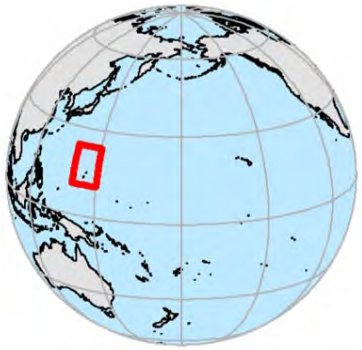


Mariana Trench Marine National Monument



-10000 m
-8000 m
-6000 m
-4000 m
-2000 m

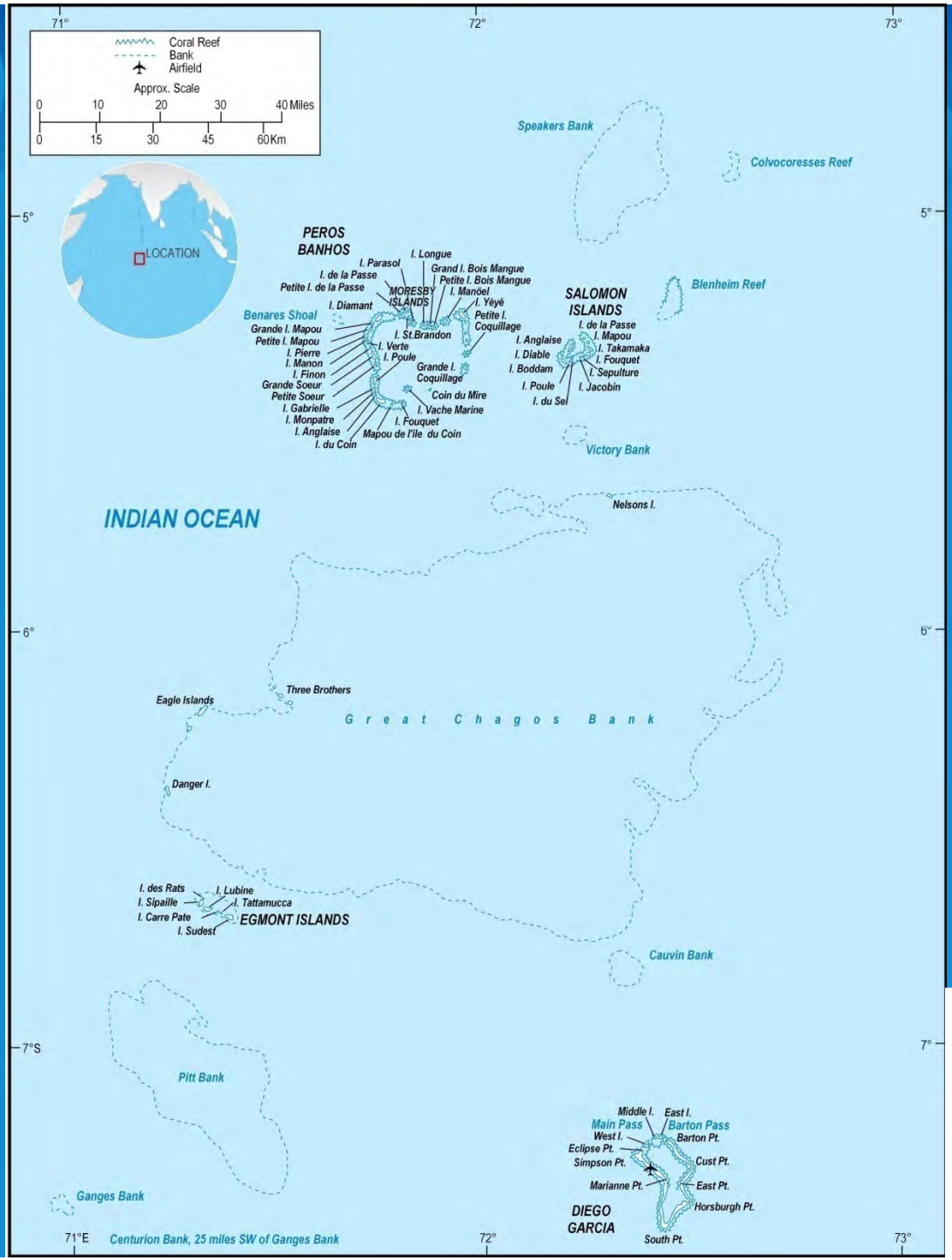
Active Hydrothermal Submarine Volcanoes
Trench Unit (59,732 nm²)
Islands Unit (12,388 nm²)
EEZ



Sources:
NOAA Coral Reef Conservation Program
NMFS Coral Reef Ecosystem Division
NESDIS NGDC
NOS/CCMA Biogeography Branch
OAR Pacific Marine Environmental Lab

BIOT MPA (Chagos)

BIOT
Marine Protected Area
(2010)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72°
73°
Coral Reef
Bank
Airfield
Approx. Scale
0 10 20 30 40 Miles
0 15 30 45 60 Km
LOCATION
5°
Speakers Bank
Colvocoresses Reef
PEROS BANHOS
I. Longue
I. Parasol
Grand I. Bois Mangue
I. de la Passe
Petite I. Bois Mangue
Petite I. de la Passe
MORESBY ISLANDS
I. Manoël
I. Diamant
I. Yéyé
Petite I. Coquillage
Benares Shoal
Grande I. Mapou
I. St.Brandon
Petite I. Mapou
I. Verte
I. Pierre
I. Poule
I. Manon
Grande I. Coquillage
I. Finon
Grande Soeur
Coin du Mire
Petite Soeur
I. Vache Marine
I. Gabrielle
I. Fouquet
I. Monpatre
Mapou de l'île du Coin
I. Anglaise
I. du Coin
SALOMON ISLANDS
I. de la Passe
I. Anglaise
I. Mapou
I. Diable
I. Takamaka
I. Boddam
I. Fouquet
I. Sepulture
I. Poule
I. Jacobin
I. du Sel
Blenheim Reef
Victory Bank
INDIAN OCEAN
Nelsons I.
6°
Three Brothers
Eagle Islands
Great Chagos Bank
Danger I.
I. des Rats
I. Lubine
I. Sipaille
I. Tattamucca
I. Carre Pate
EGMONT ISLANDS
I. Sudest
Cauvin Bank
7°S
7°
Pitt Bank
Middle I.
East I.
Main Pass
Barton Pass
West I.
Barton Pt.
Eclipse Pt.
Simpson Pt.
Cust Pt.
Marianne Pt.
East Pt.
Horsburgh Pt.
DIEGO GARCIA
South Pt.
Ganges Bank
71°E
Centurion Bank, 25 miles SW of Ganges Bank

Toward Fostering Peer Learning

December 6, 2010
Honolulu, Hawai‘i

- First ever gathering of managers from the world’s largest MPA/ MMAs
- Outlined the purpose and objectives
- Produced Communiqué on value of Large-Scale MPA/ MMAs

BIG OCEAN

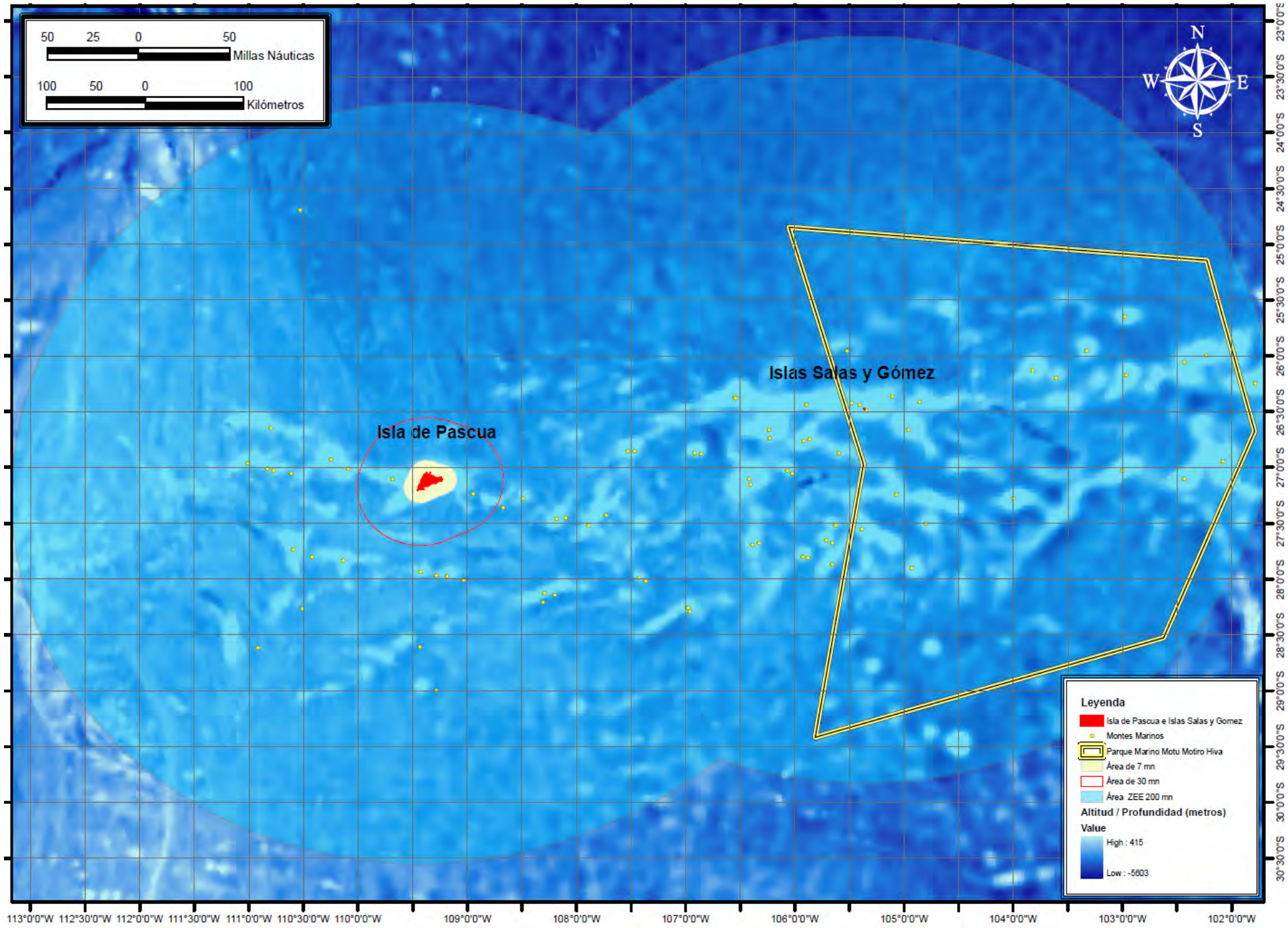
Big Ocean:
Early "Large-Scale" Definition

"A marine conservation area over 100,000 miles^2 (258,998 kilometers^2) in size that is actively managed for protection across the entire geographic boundary of the site.

For our purposes, the term does not apply to geographic designations of habitat, foraging areas or harvest restrictions that are not also accompanied by a corresponding management regime, agency or consortium of agencies."

Motu Motiro Hiva

Motu Motiro Hiva
Marine Park
(2010)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Millas Náuticas
100 50 0 100
Kilómetros
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W
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S
Isla de Pascua
Islas Salas y Gómez
Leyenda
Isla de Pascua e Islas Salas y Gomez
Montes Marinos
Parque Marino Motu Motiro Hiva
Área de 7 mn
Área de 30 mn
Área ZEE 200 mn
Altitud / Profundidad (metros)
Value
High : 415
Low : -5603
113°0'0"W 112°30'0"W 112°0'0"W 111°30'0"W 111°0'0"W 110°30'0"W 110°0'0"W 109°0'0"W 108°0'0"W 107°0'0"W 106°0'0"W 105°0'0"W 104°0'0"W 103°0'0"W 102°0'0"W
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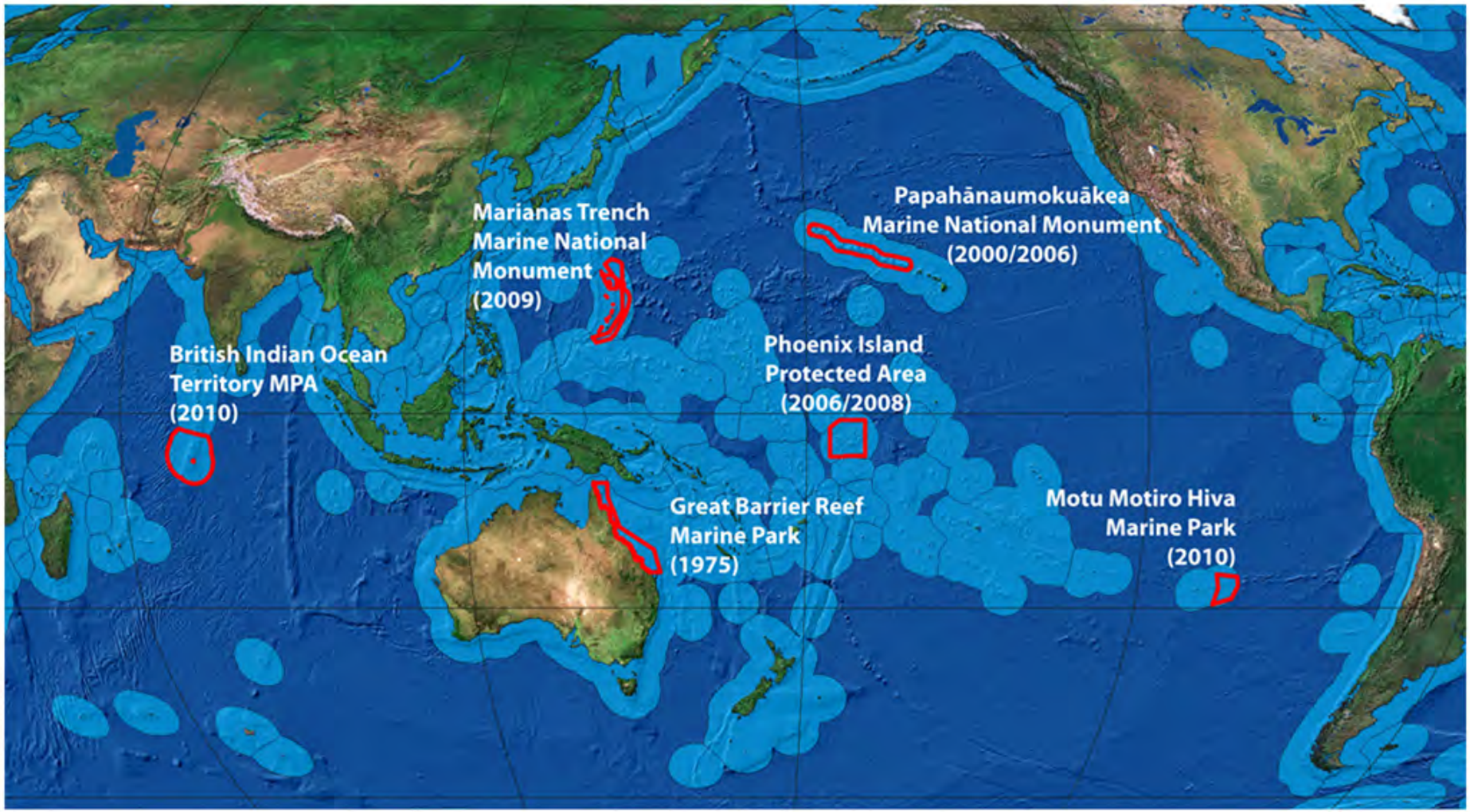
BIG OCEAN

A Network of the World's Large Scale Marine Managed Areas



Founding Big Ocean sites represent more than 2.3 million km^2 (approx. 900,000 mi^2) of ocean ecosystems—roughly the same size as the Mediterranean Sea

Introduction:
Rationale to 'Go Big'

1. Call for ecosystem-level management
2. Complementary approach to smaller-scale MPAs
3. A need to protect remote marine areas
4. A need to protect and perpetuate cultural heritage and traditions
5. Call to increase marine protection efforts

Challenges:
Unique to Large-Scale Sites

- Large = Expensive, Remote = complicated
- Threats are global, beyond management control
- Enforcement and surveillance
- Too large to fully survey and understand
- Large-scale designations challenge current status of ocean management typically governed by single-sector interests

Compounding Challenges: 'Remoteness Factors'

- Costs and logistical challenges increase dramatically when the area is not only large, but far from operational centers and resources
- Maintaining community/public support and consistent awareness about places far from population centers

Founding Goals & Aims

A network of managers and scientists of the world's Largest marine protected areas (MPAs).

Goal:

- "To work together and learn from one another to improve the effectiveness of our management efforts."

Three Specific Aims:

- Learning (improve management practice)
- Knowledge (increase science & understanding
- Communication (internal & external)

Network Purpose
Early Proposed Activities

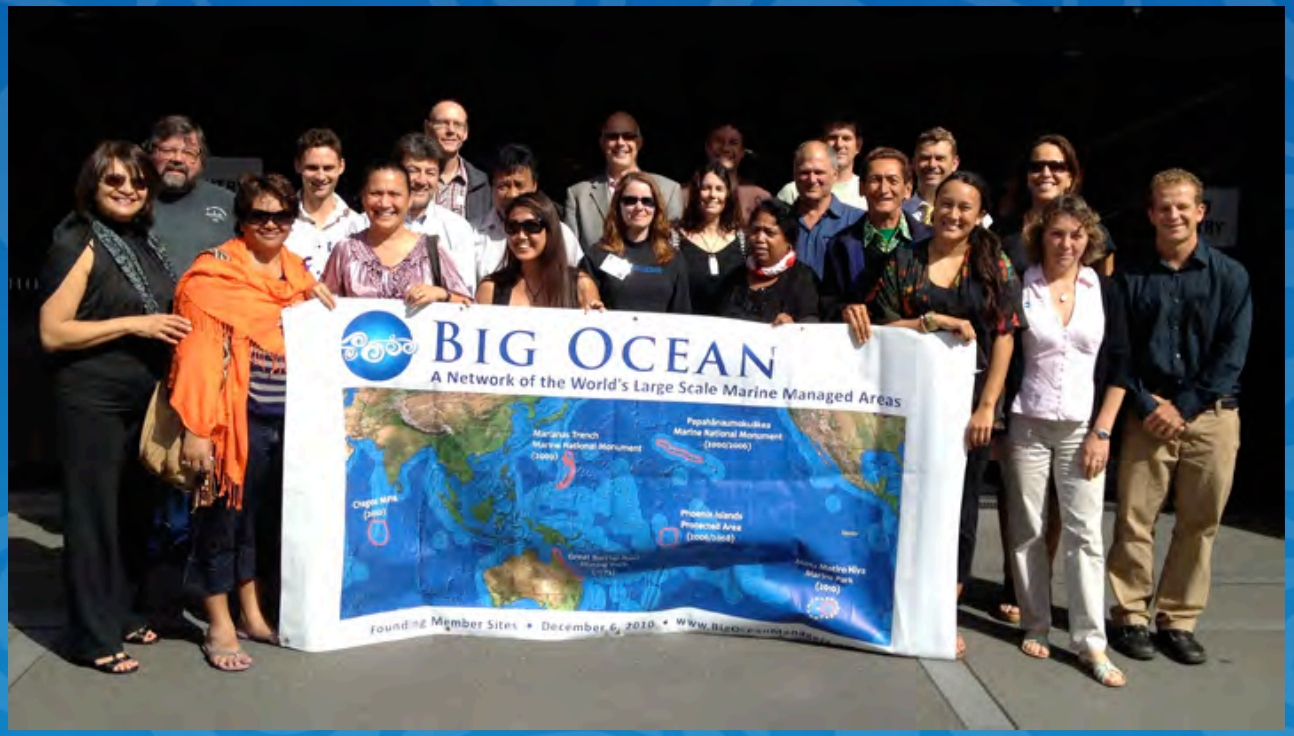
- Sharing experiences, information, and tools
- Peer-to-peer (manager) learning exchanges
- Joint scientific research for management application
- Development and testing of new technology (e.g., remote surveillance and enforcement)
- Support and mentoring to less experienced management teams by more experienced ones
- Support to decision-maker inquiry regarding the unique challenges and opportunities of large-scale MPAs

Meeting No.2

- Developed 18 month work plan
- Established committees on planning, enforcement, research
- First academic presentation at international conference

May 13, 2011• Victoria, B.C.
in conjunction with the 2011
International Marine Conservation Congress

Meeting No.3 ~ Think Tank



December 1-4, 2011
Auckland,
New Zealand

In conjunction with 2011 International Congress on Conservation Biology

- Invited Cook Islands, New Zealand & AAMP to participate
- Developed outline for shared research agenda for large-scale sites
- Initiated development of an international guidebook on large-scale MMA management

Meeting No.4

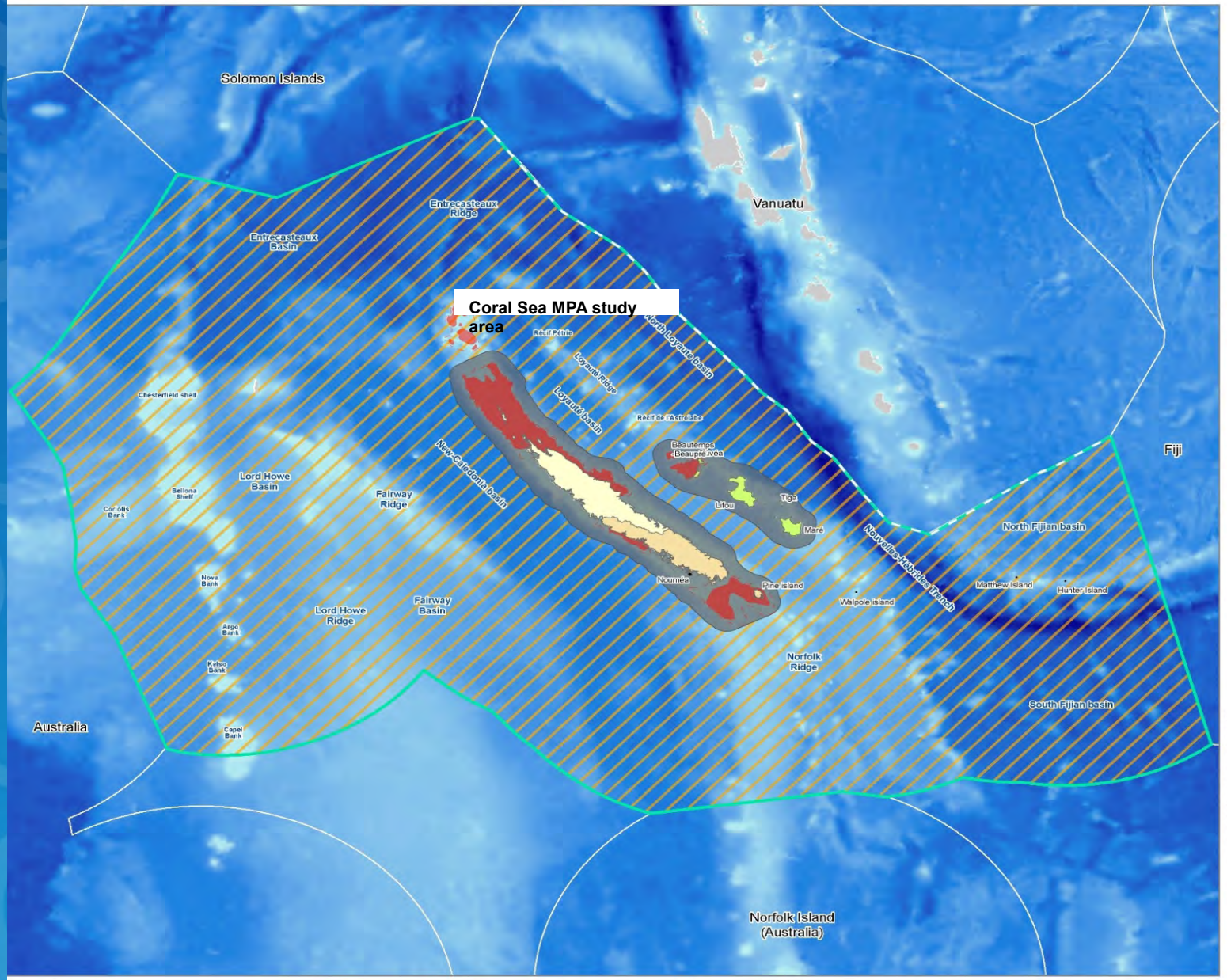
September 5, 2012
Jeju, Republic of Korea

In conjunction with the 2012 IUCN World Conservation Congress

- Agreed to develop a international guidebook on large-scale and aim to partner with IUCN-WCPA
- Formally invited Cook Islands to join
- Approved shared research agenda
- Submitted first fundraising proposal
- Established Learning Network


Pukapuka
Mainihiki
Kiribati
Nassau
Suwarrow
American Samoa
French Polynesia
Palmerston
Aitutaki
Cook Islands
Proposed Marine Park
Niue
Atiu
Rarotonga
Mauke
Mangaia

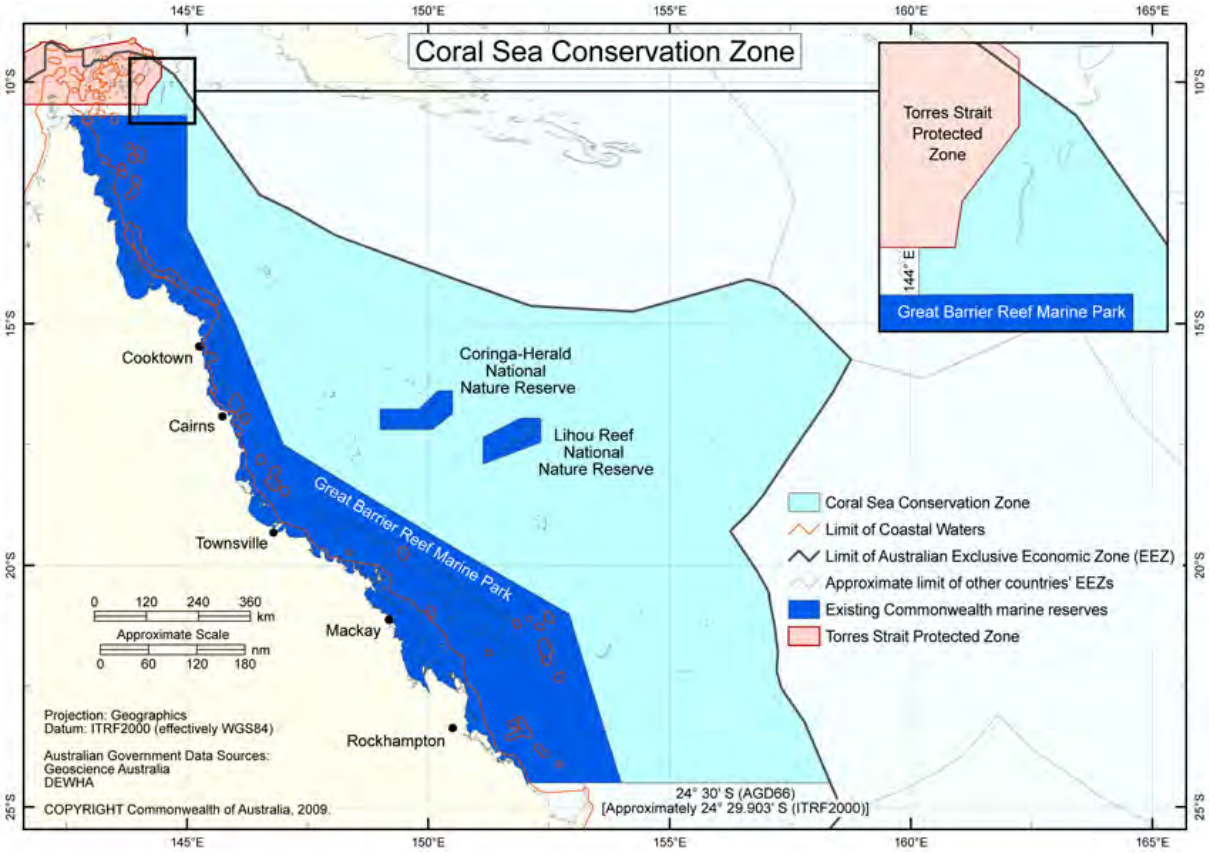
NEW-CALEDONIA
Coral Sea Marine Protected Area Project



Coral Sea Conservation Zone (CSCZ)

The Coral Sea Conservation Zone covers around 972,000km^2 of Australian waters and seabed east of the Great Barrier Reef Marine Park, out to the edge of Australia's Exclusive Economic Zone.

The CSCZ is managed by the Marine Division of DSEWPAC

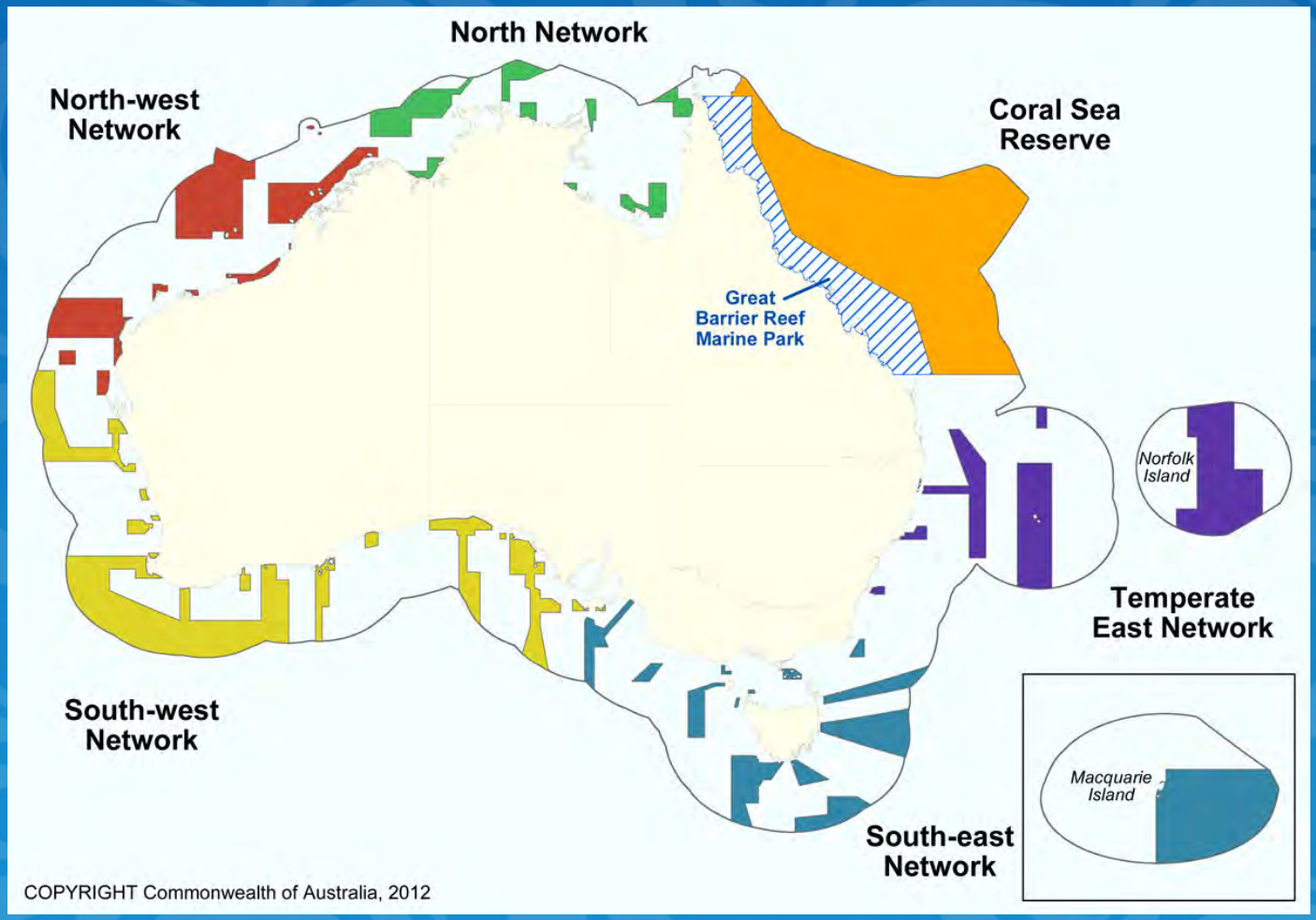


Australia Creates Largest Area of Marine Reserves

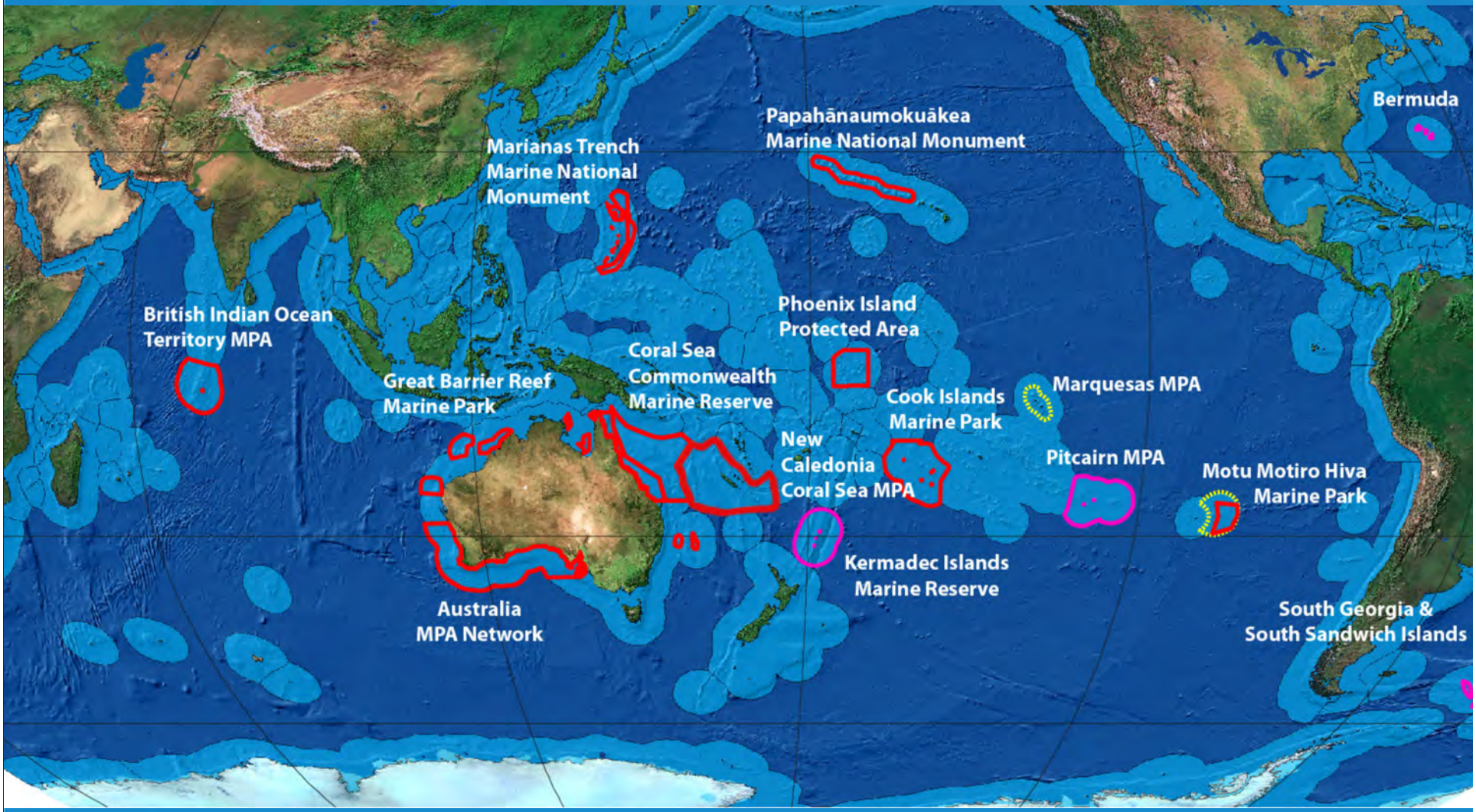
Associated Press

By ROD McGUIRK
CANBERRA, Australia June 14, 2012 (AP)

Australia has created the world's largest network of marine reserves and will restrict fishing and oil and gas exploration in a major step to safeguard the environment and access to food.



THE TREND CONTINUES



Research Agenda for Large-Scale MPAs

- Published in February 2013
- Addresses unique research challenges and needs of large-scale MPAs
- Has initiated collaborative research projects across sites
- BIOT and PMNM collaborative research expedition in February-March 2013

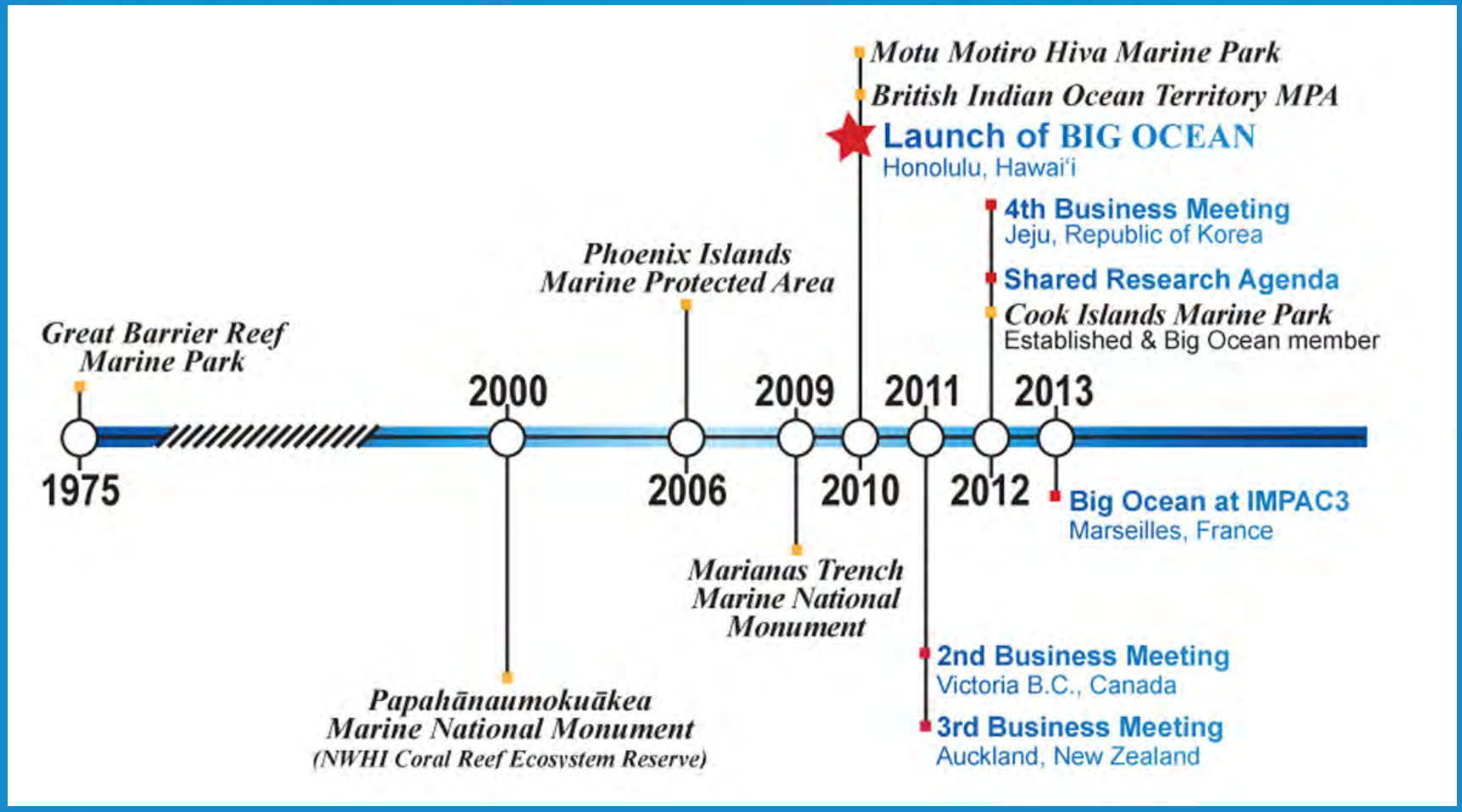
Benefits & Opportunities: Accomplishments to Date

- Hosted four business meetings
- Developed a shared 18 month work plan
- Hosted Marine Think Tank on research ‘at-scale‘
- Published *Shared Research Agenda for Large-Scale MPAs*
- Developed outline for a Managers’ Guidebook
- Conducted joint research cruise between BIOT & PMNM
- Presented Workshop & Knowledge Café on large-scale MPAs
- Expanded the network adding the Cook Islands Marine Park

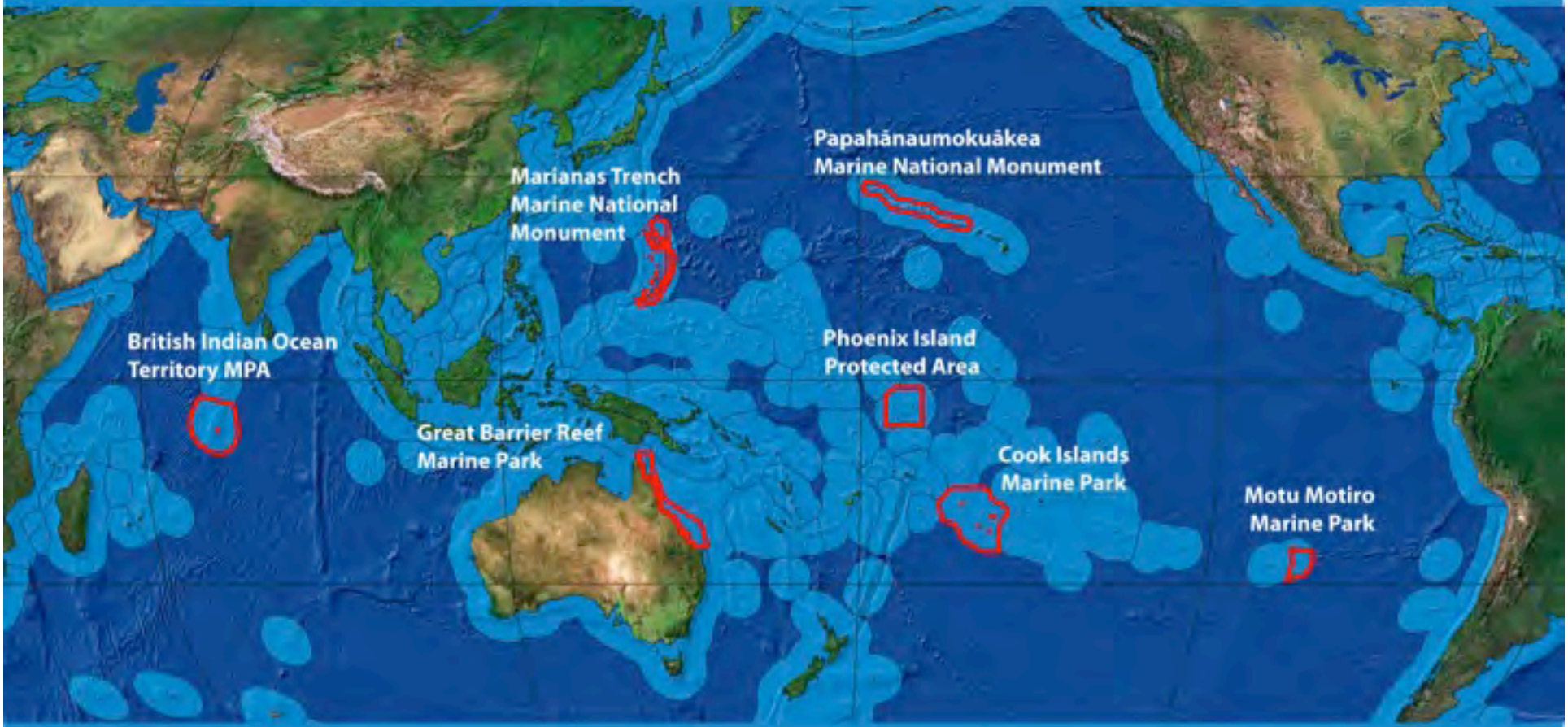
Benefits & Opportunities: 2013-2014 Priorities

- Partner with IUCN on a Managers' Guidebook
  - Draft document to be completed in 2013
  - Final document to be completed in 2014
- Hold 5th Business Meeting in conjunction with IMPAC3 in Marseille, France
- Continue progress on Shared Research Agenda
- Solicit partners and funding to support network activities

Genealogy of Big Ocean



Member Sites




Collectively, Big Ocean member sites currently encompass 3.2 million km² (1.2 miilion mi²) of ocean —twice the size of the Gulf of Mexico.

www.BigOceanManagers.org

info@bigoceanmanagers.org