Ocean Observations for Environmental Management : Opportunities and Challenges

SAMREF Workshop - 22 July 2015

#Team_DEA_Research

Oceans and Coasts

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STRUCTURE

- RESEARCH OPPORTUNITES
  - Why?
  - Where?
  - How? Platforms, instrumentation and equipment
  - Who?
- Challenges and Potential Cooperation

GOVERNING LAWS, FRAMEWORK AND MANDATE

- CONSTITUTION
- NEMA
- ICM
- NEMO

Conduct oceans and coastal research through long-term monitoring for environmental management in support of sustainable development opportunities

Research Types

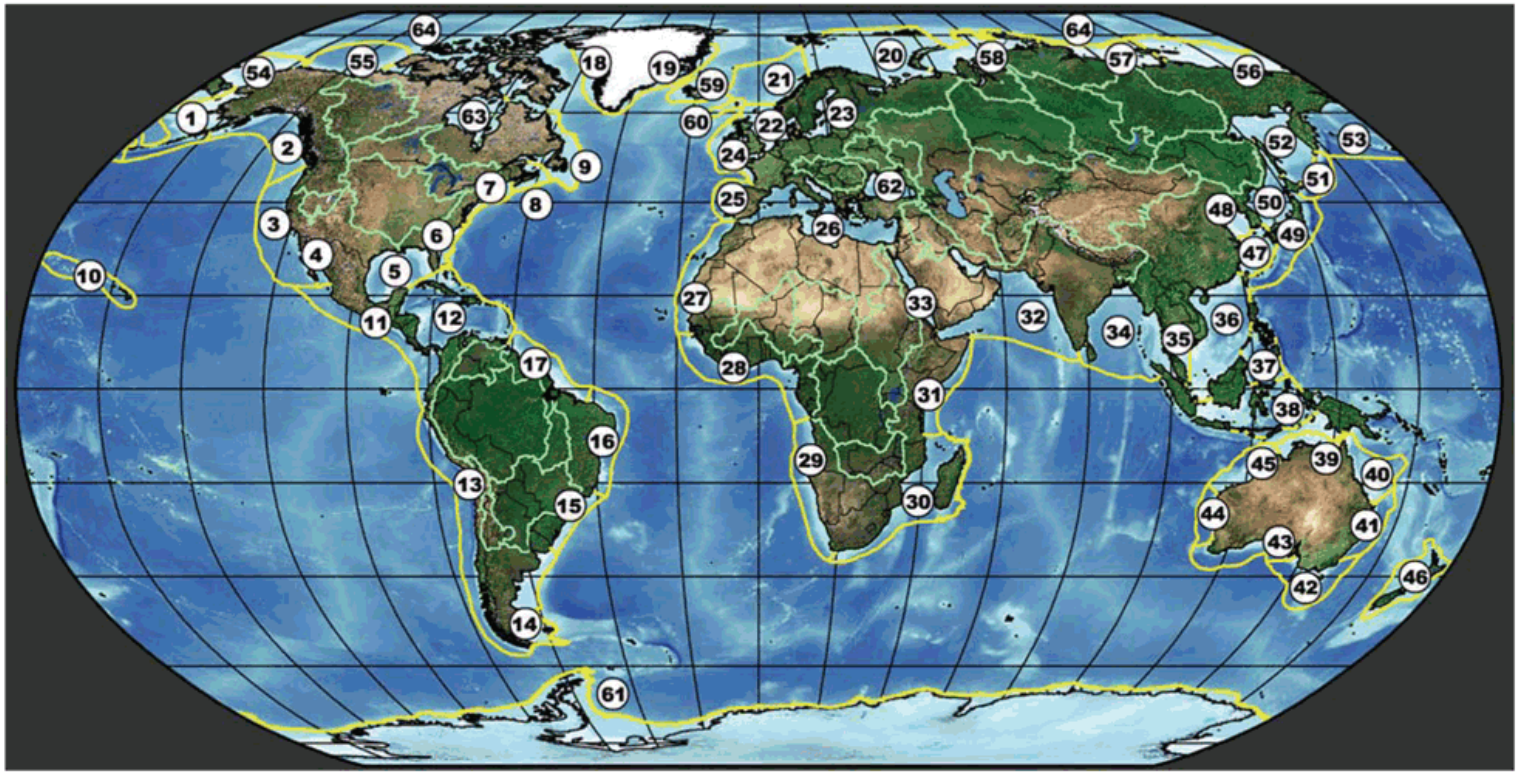
- **Applied Research**

is a form of systematic inquiry involving the practical application of science… for a specific, often state-, business-, or client-driven purpose

- **Basic Research**

is a systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena - executed without thought of a practical end goal, without specific applications or products in mind.

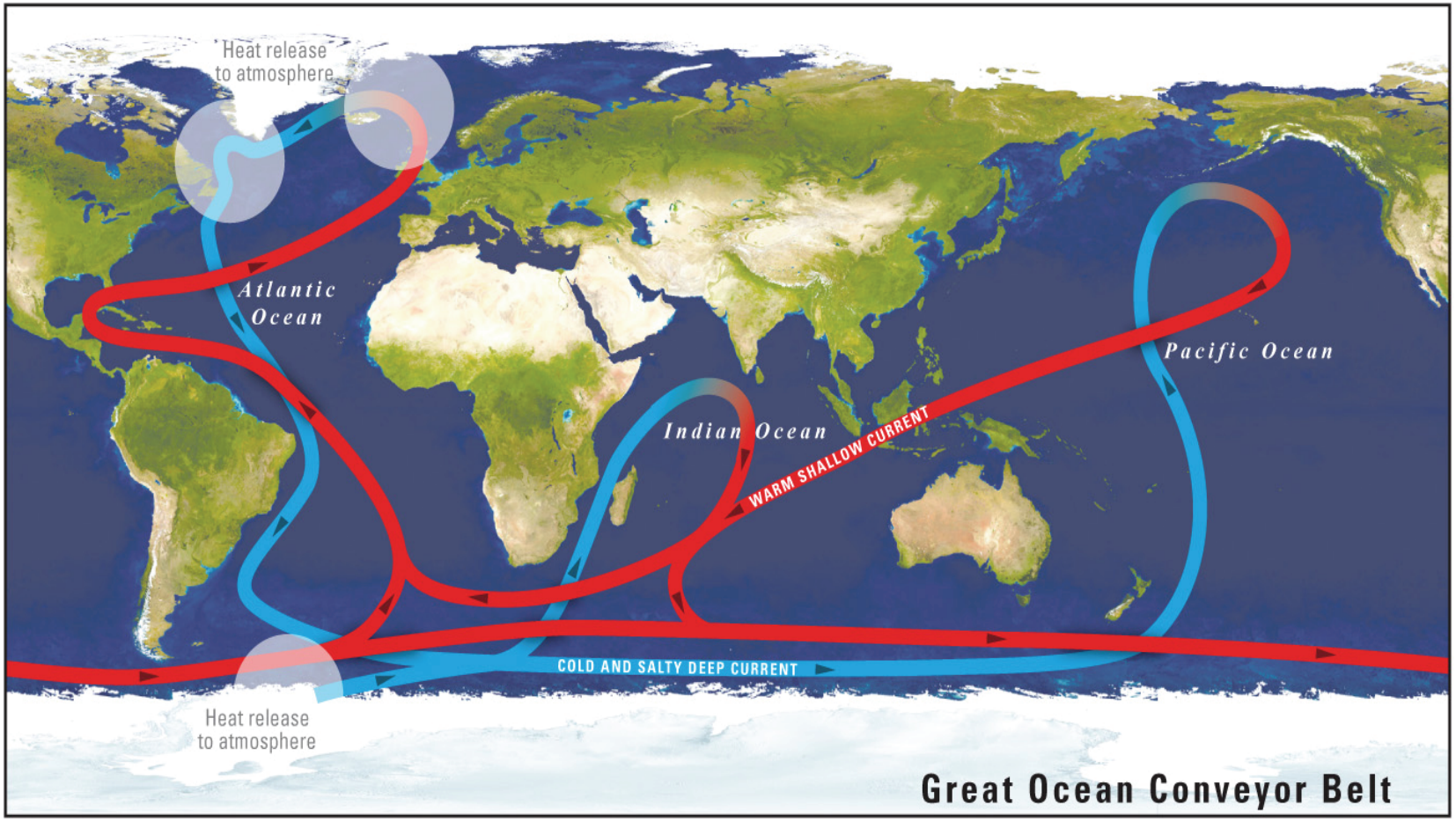
In Support of Marine Resources



1. East Bering Sea
2. Gulf of Alaska
3. California Current
4. Gulf of California
5. Gulf of Mexico
6. Southeast U.S. Continental Shelf
7. Northeast U.S. Continental Shelf
8. Scotian Shelf
9. Newfoundland-Labrador Shelf
10. Insular Pacific-Hawaiian
11. Pacific Central-American
12. Caribbean Sea
13. Humboldt Current
14. Patagonian Shelf
15. South Brazil Shelf
16. East Brazil Shelf
17. North Brazil Shelf
18. West Greenland Shelf
19. East Greenland Shelf
20. Barents Sea
21. Norwegian Sea
22. North Sea
23. Baltic Sea
24. Celtic-Biscay Shelf
25. Iberian Coastal
26. Mediterranean
27. Canary Current
28. Guinea Current
29. Benguela Current
30. Agulhas Current
31. Somali Coastal Current
32. Arabian Sea
33. Red Sea
34. Bay of Bengal
35. Gulf of Thailand
36. South China Sea
37. Sulu-Celebes Sea
38. Indonesian Sea
39. North Australia
40. Northeast Australia
41. East-Central Australia
42. Southeast Australia
43. Southwest Australia
44. West-Central Australia
45. Northwest Australia
46. New Zealand Shelf
47. East China Sea
48. Yellow Sea
49. Kuroshio Current
50. Sea of Japan
51. Oyashio Current
52. Sea of Okhotsk
53. West Bering Sea
54. Chukchi Sea
55. Beaufort Sea
56. East Siberian Sea
57. Laptev Sea
58. Kara Sea
59. Iceland Shelf
60. Faroe Plateau
61. Antarctic
62. Black Sea
63. Hudson Bay
64. Arctic Ocean

Figure 2. Global map showing 64 LMEs and linked watersheds.

Climate Variability and Global Change - of Salt and Heat Exchange



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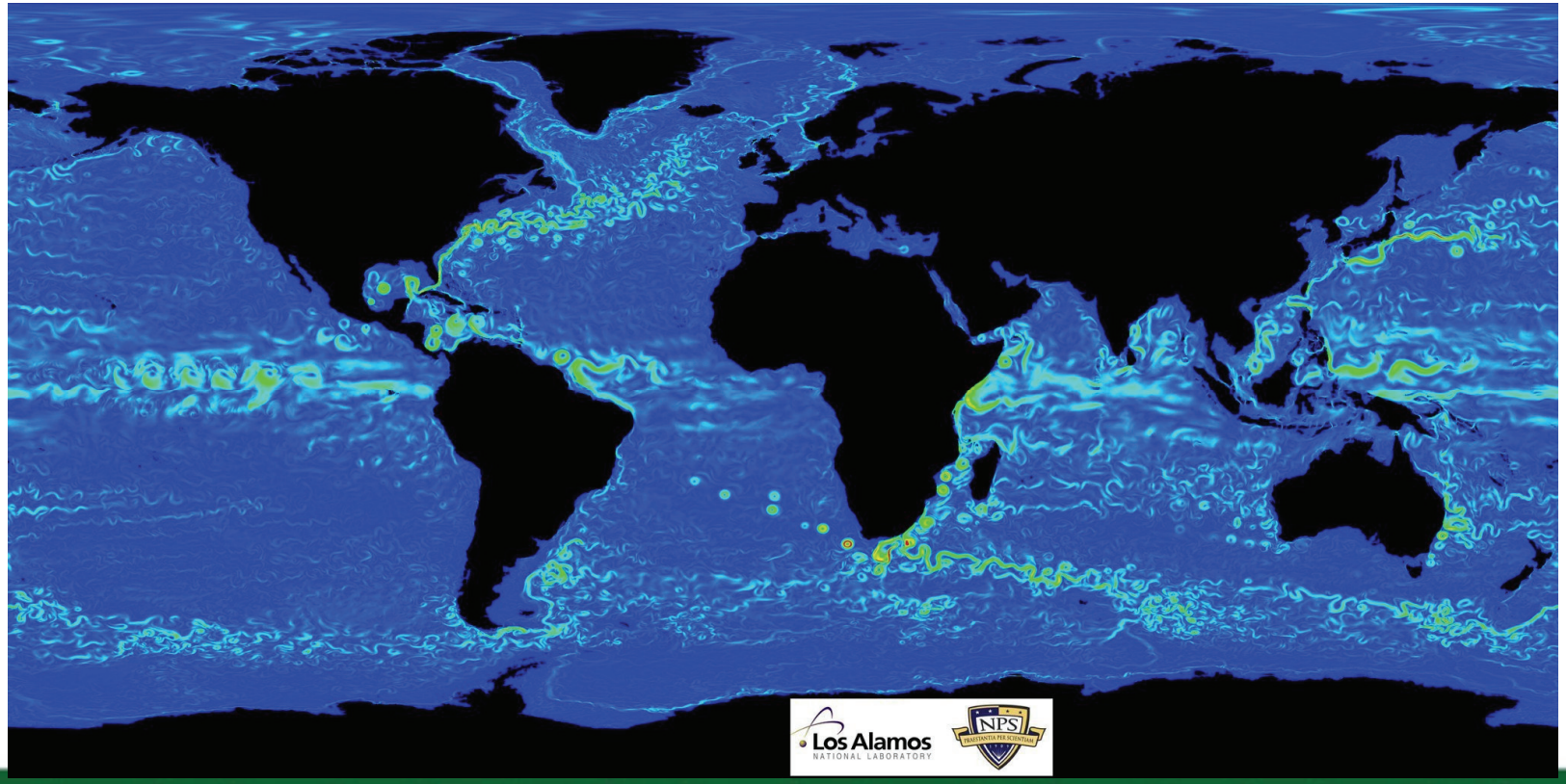
Effects of ocean dynamics to citizens



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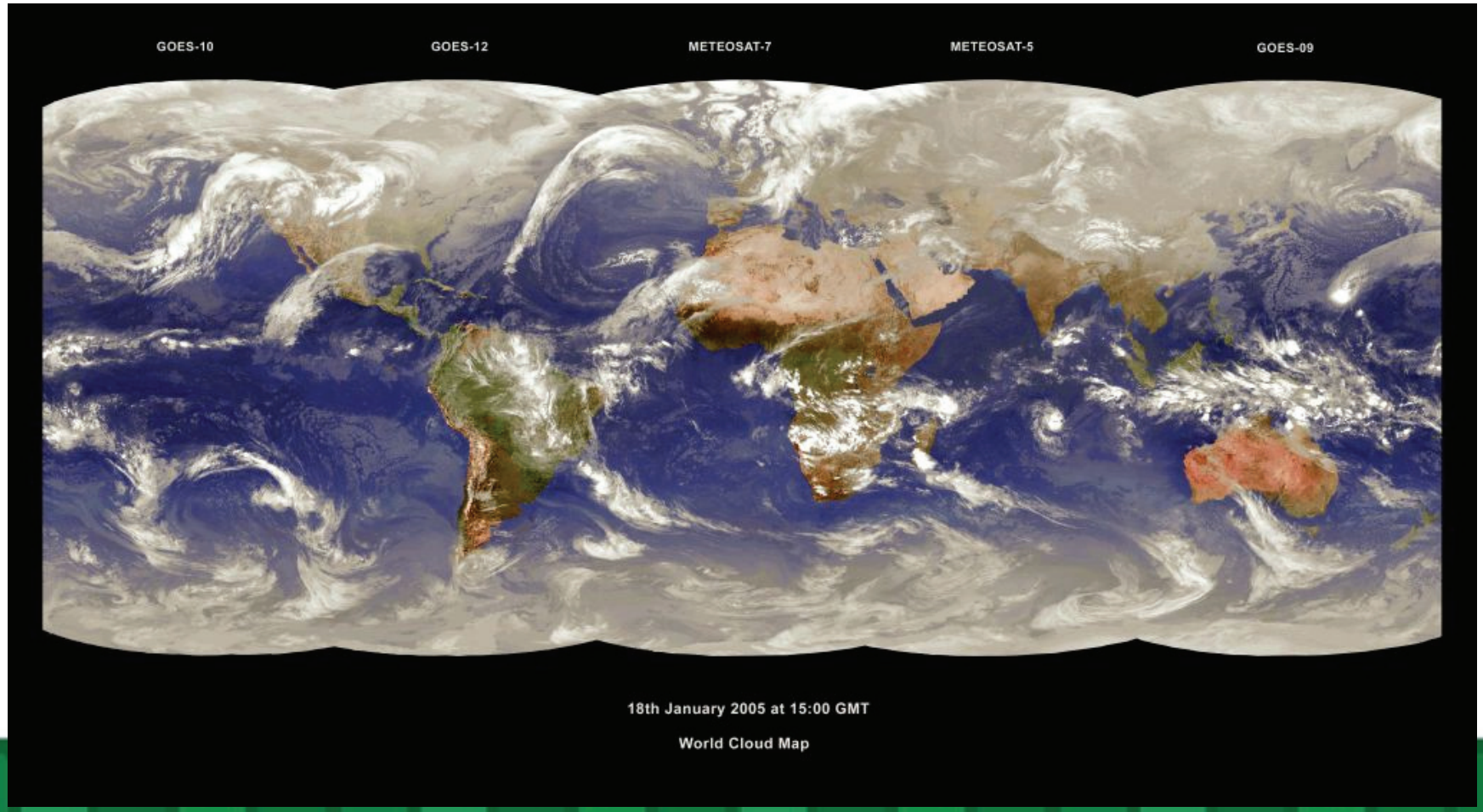
Weather: detect Cold Fronts whilst still at sea



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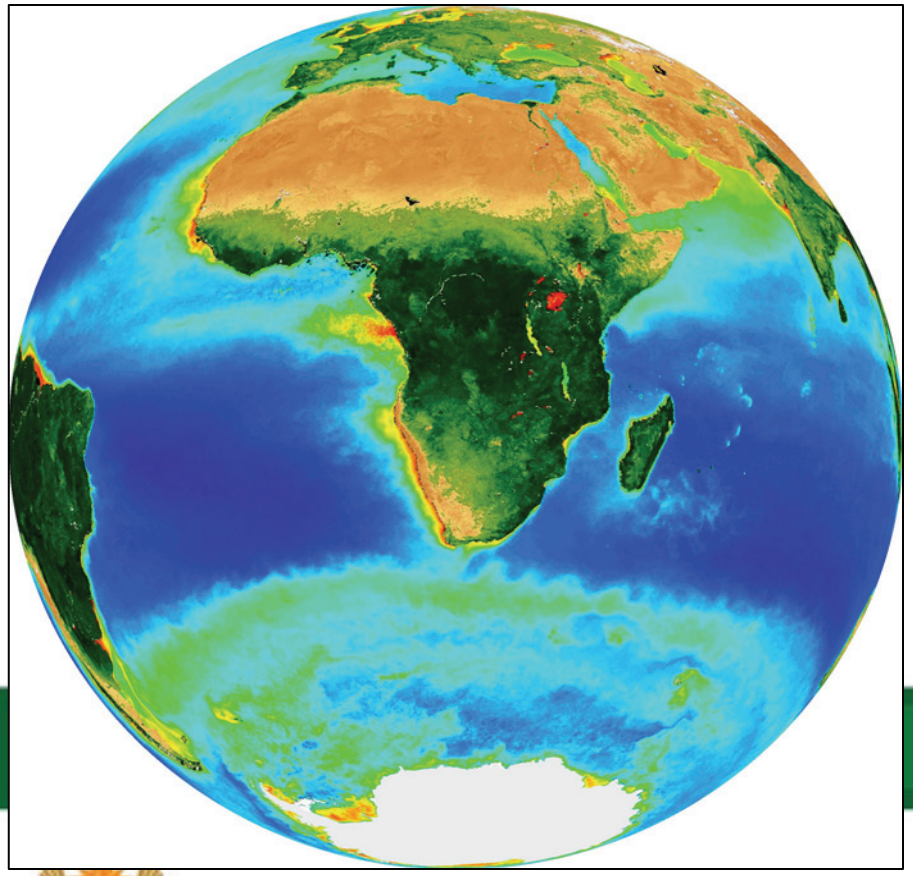
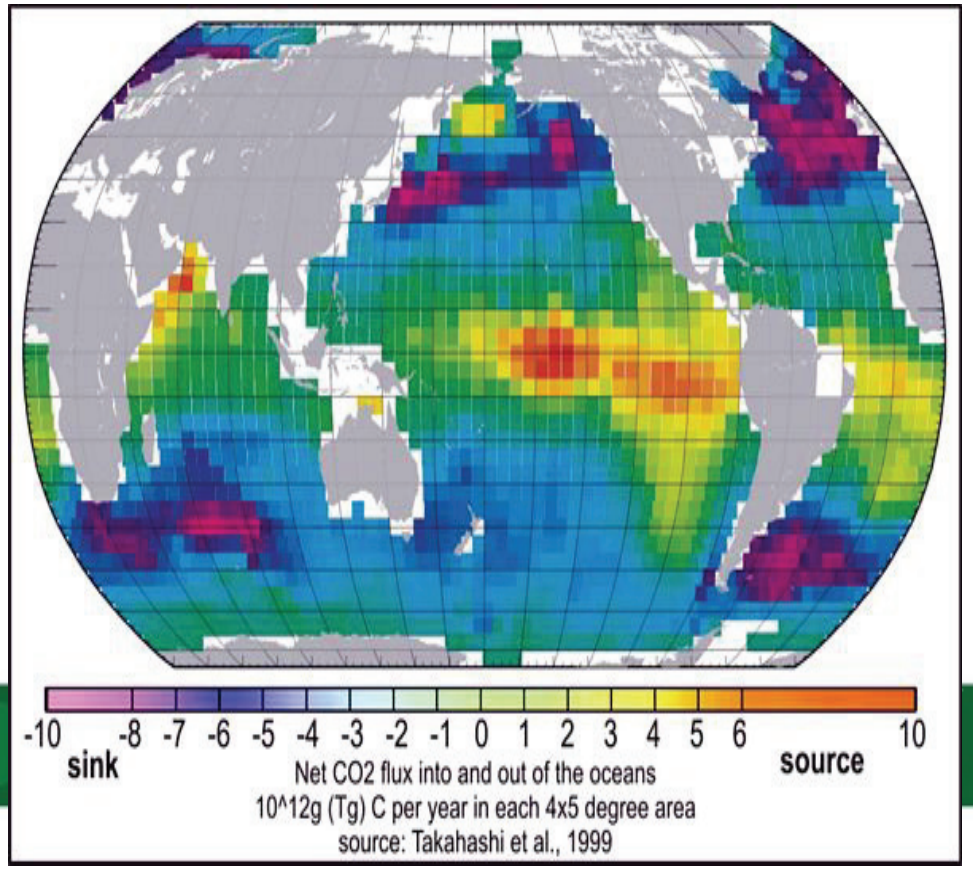
Ocean Acidification: Effects on marine organisms, resources and ecosystem ...





….Effects on many species and communities

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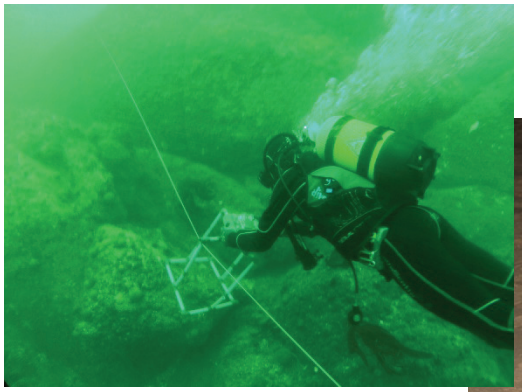
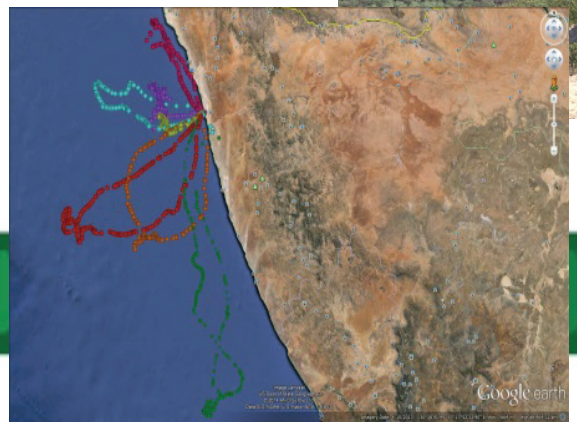
….Effect On Habitats





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Platforms used: Moored and autonomous

- RV Algoa (RSA)- Coastal

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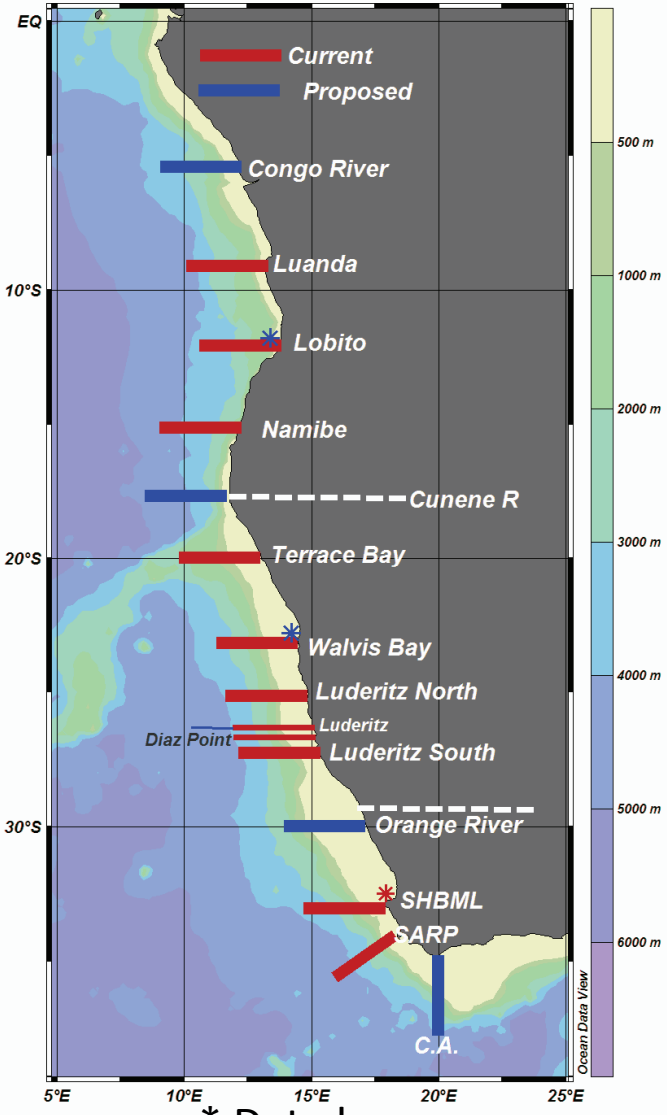
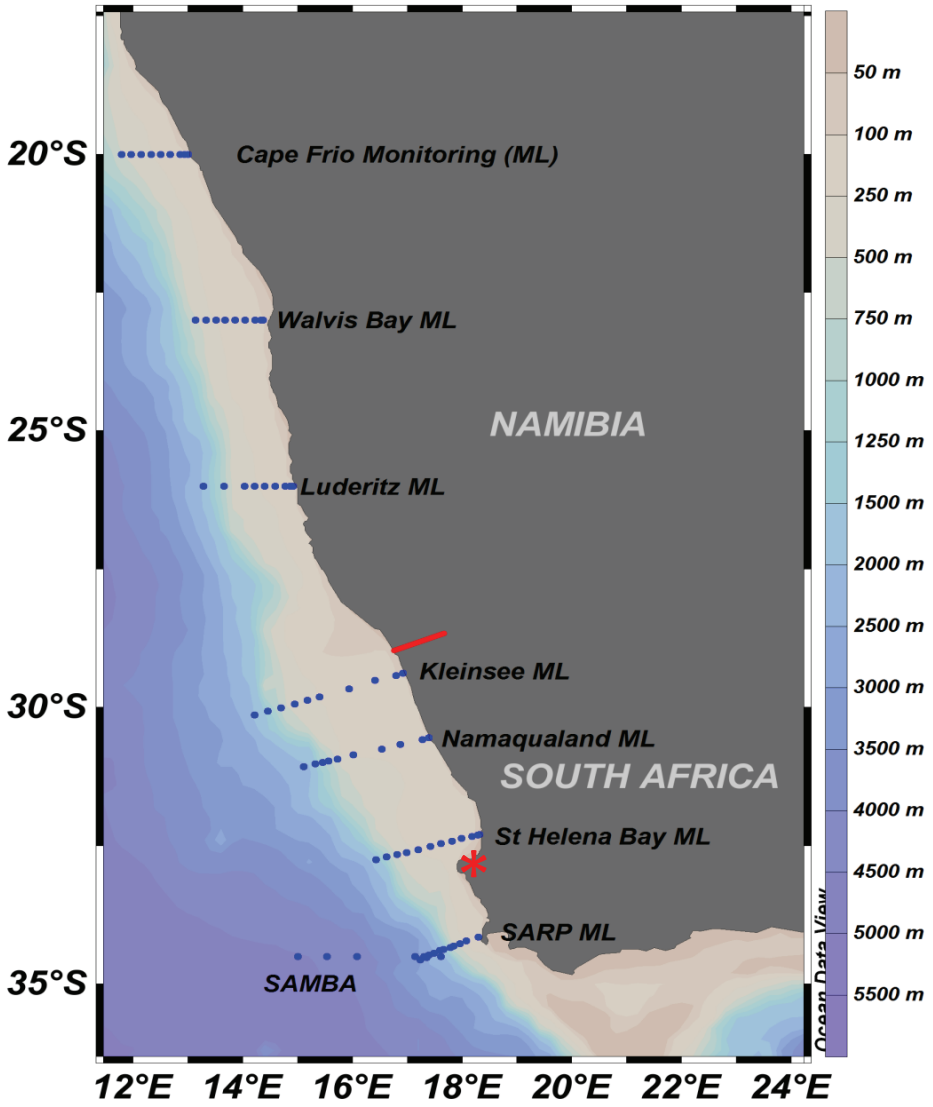
RSA's Ocean and Coastal Monitoring systems

Regional

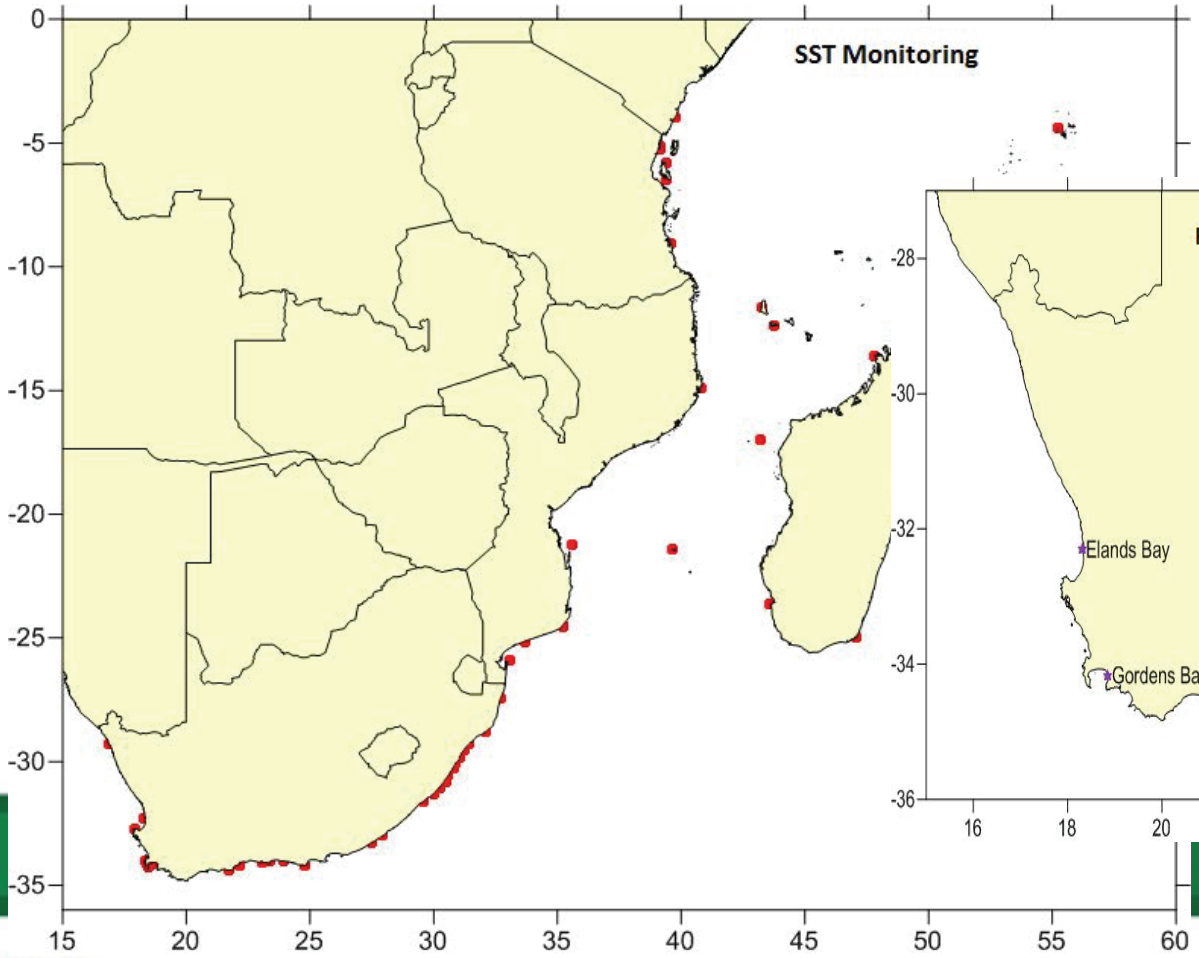


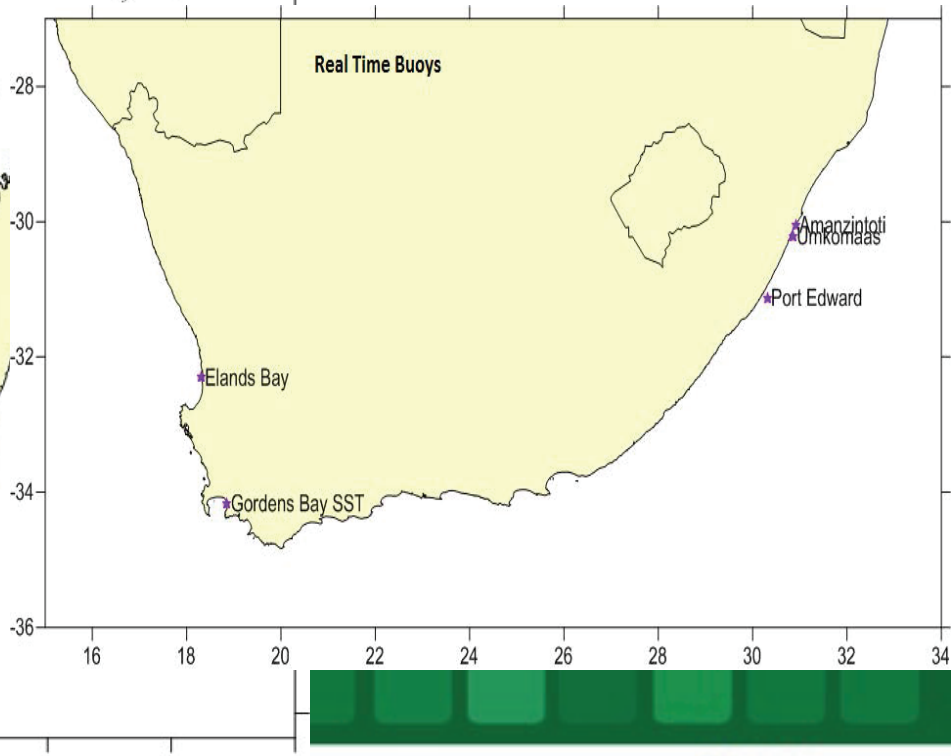
* Data buoys

RSA and Namibia



Real-time vs Delayed time measurements





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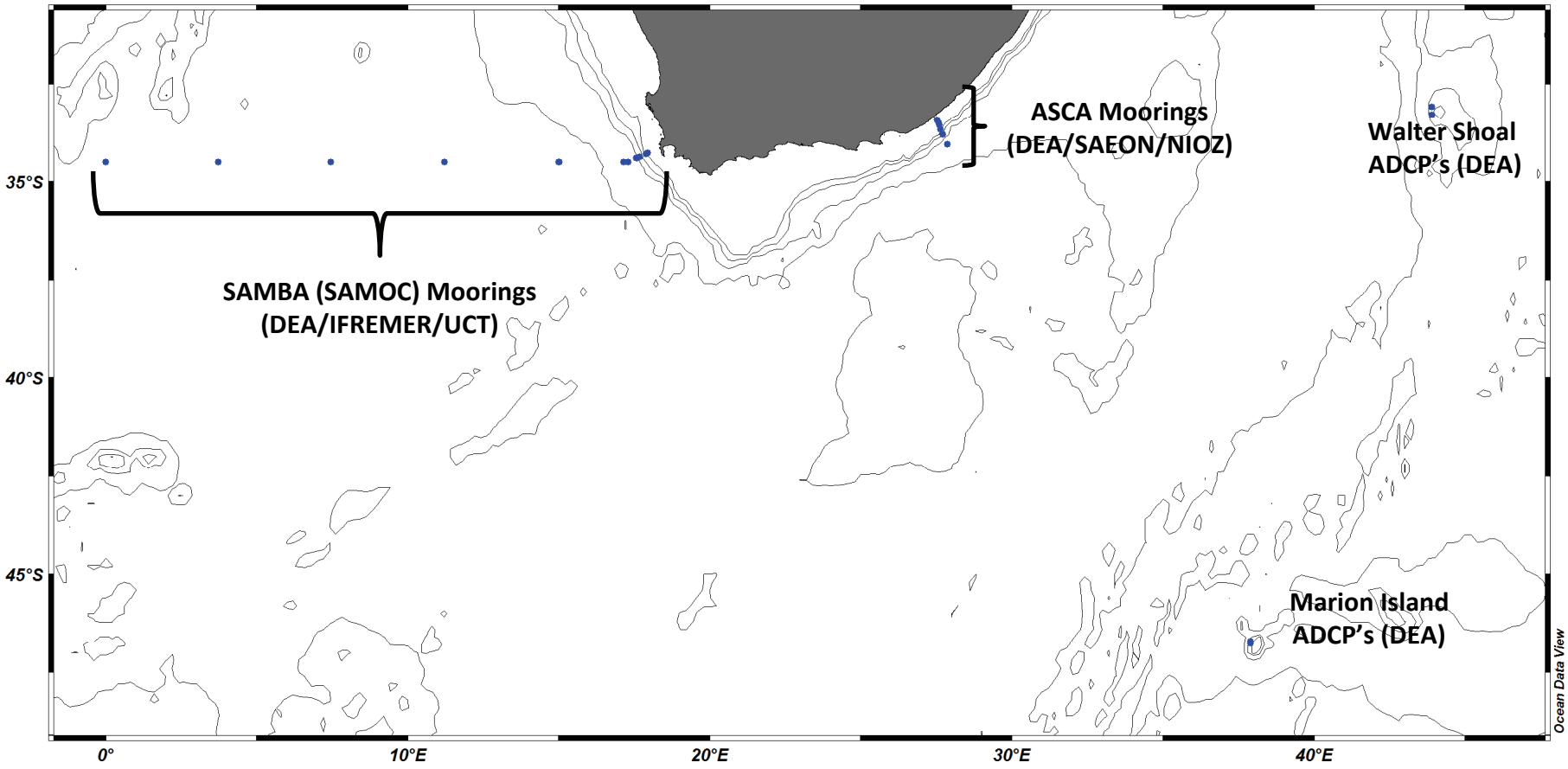
Current Meter Moorings

(currently deployed – June 2015)



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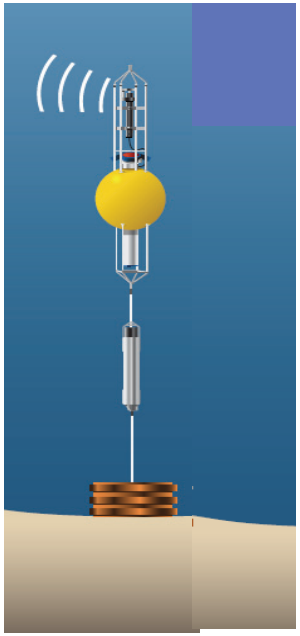
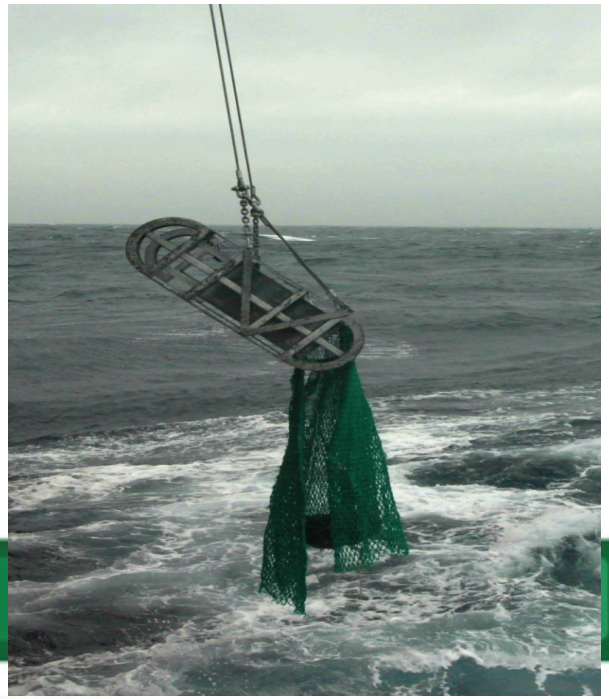
Moored Platforms: buoys, floats, etc





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#TeamRESEARCH

TEAM ~73

Scientists
Technicians
Engineers
Research Assistants
Interns

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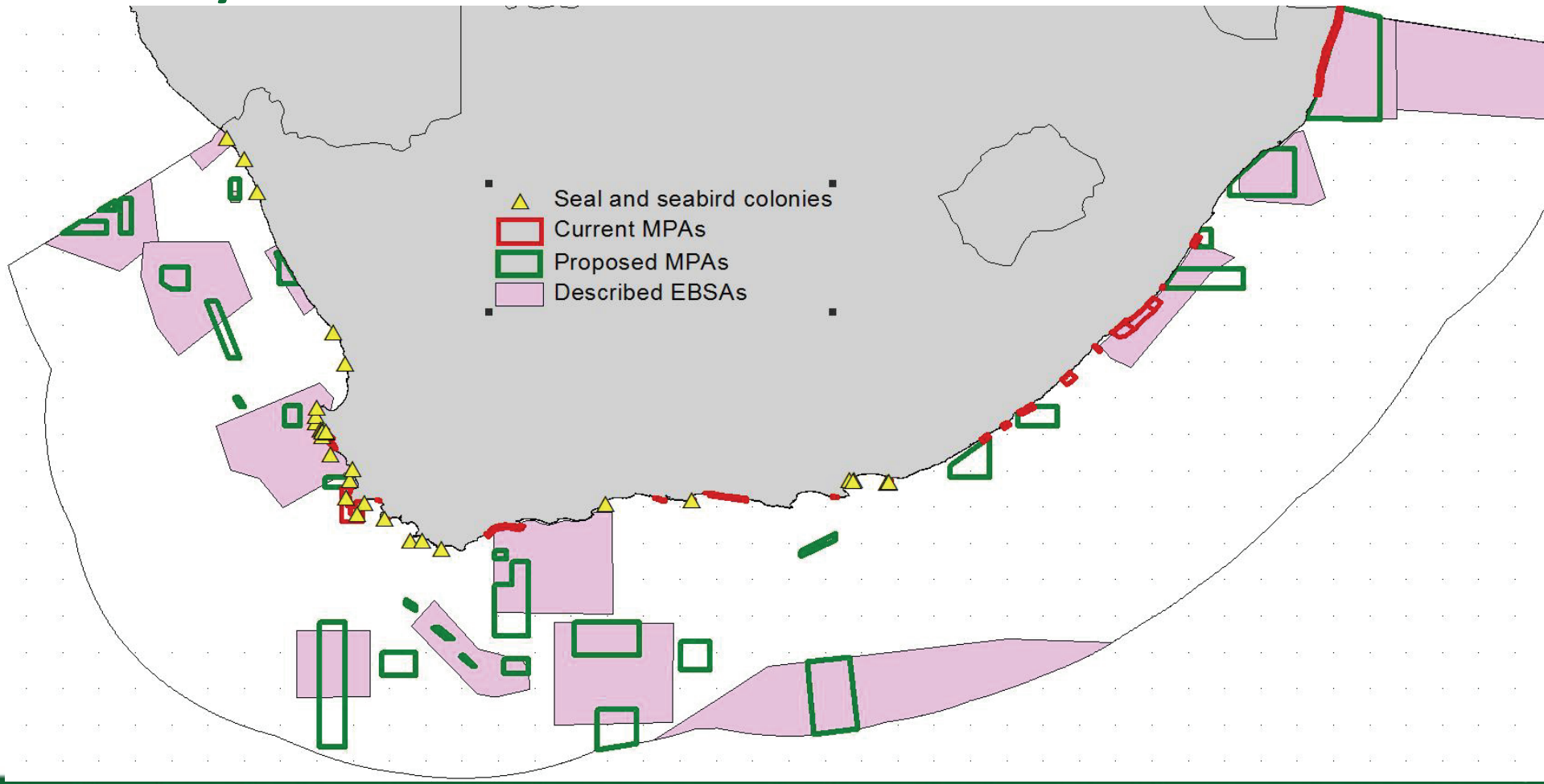
Areas of Collaboration

- Monitoring Ecosystem Health
- Marine Spatial Biodiversity
- Operational and Observational Oceanography
- Ecosystem Processes and Global Change
- Data and Information: Generation, Analysis, and management

Priority environmental areas



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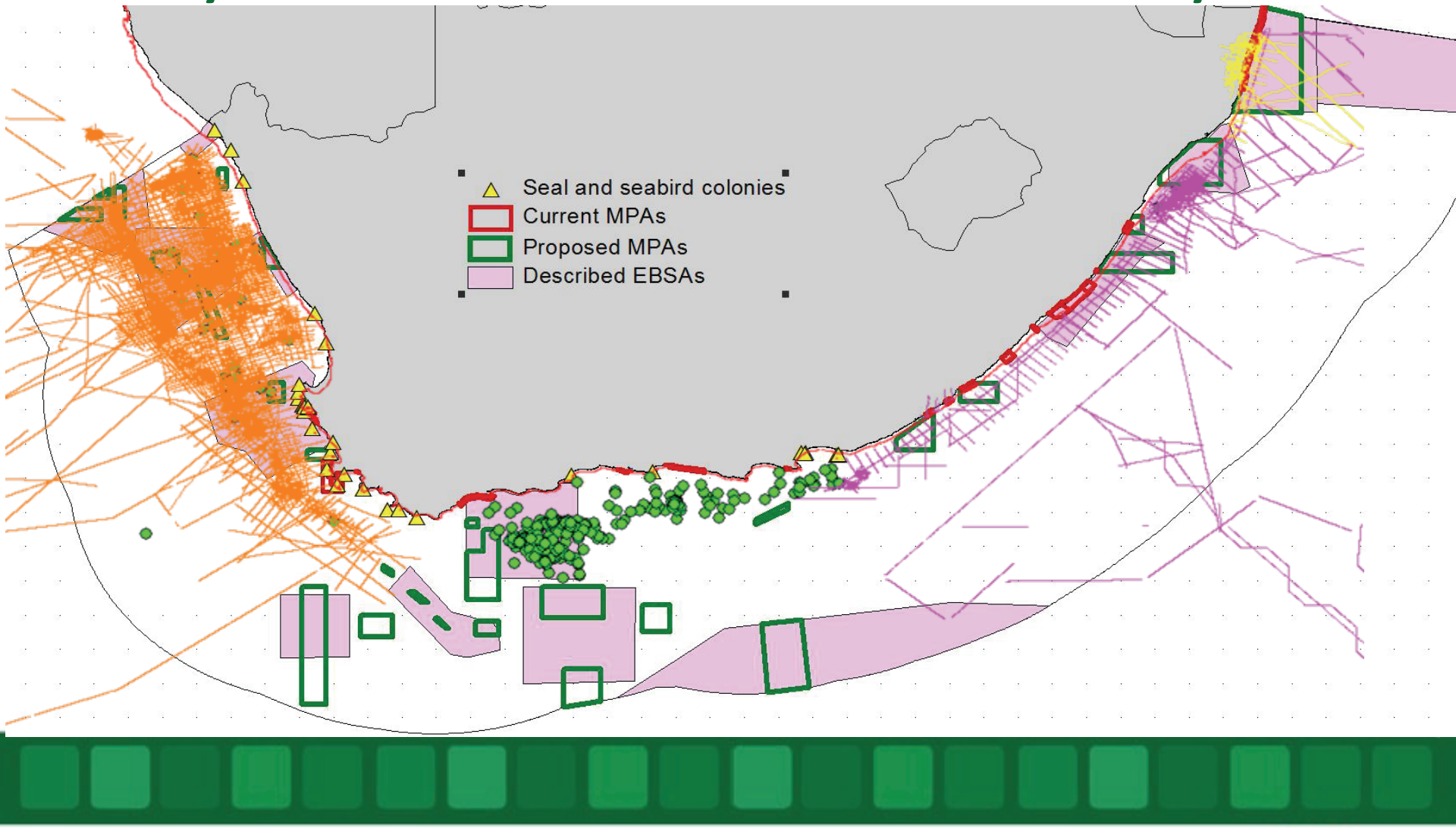
Priority environmental areas vs Maritime Activity



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Challenges and Potential Cooperation

- Economy vs Environment Conflict:
  - "Conflicts" converted into collaboration and cooperation → Opportunities
- Partnerships in data and information "sharing" – Respecting confidentiality of data and information
- Establish/Strengthen a "common vision"
- Sharing of resources for a common purposes with different results:

  - Co-invest in infrastructure or equipment Indicators and impacts of pollution and other impacts
- Share platforms for
  - Monitoring of alien invasions and impacts
  - Monitor migration of marine living resources

Challenges and Potential Cooperation

- Combination of moored and autonomous platforms – give and take and take and give model – ROVs, gliders, buoys, animals, etc
- Berth exchange – standby safety/ships – underway measurements
- Monitoring and research combined – in situ, autonomous and remote-sensing data
  - Indicators of global change or ecosystem variability (top predators)
  - Indicators of change in ecosystem (health, structure and functioning)
- Coupled with in-situ ships measurements

- **IDEALLY: A NATIONAL OCEAN OBSERVING SYSTEM WITH VARIOUS INPUTS FROM MULTIPLE CONTRIBUTORS SERVING MULTIPLE USERS WITH CUSTOMISED PRODUCTS!**

"Our future as human beings depends on our intelligent and prudent use of the oceans. And that in turn will depend on the determined efforts of dedicated women and men from all parts of our planet."

Dr Nelson Rolihlahla Mandela at the 5th Session of the Independent World Commission on the Oceans, Cape Town, South Africa, 11 November 1997

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