

Coastal zone issues and management in Europe

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Content

- Shifting patterns
- Human behavior
- Spatial planning
- Stimulating system innovation by incorporation of newly developed concepts, such as building with nature.

Starting points in the Netherlands

- Failing to adapt is not an option (cost of adaptation is far lower than the damage costs without adaptation);
- Maintaining the same level of risk posed by coastal flooding requires increasing protection above current levels.

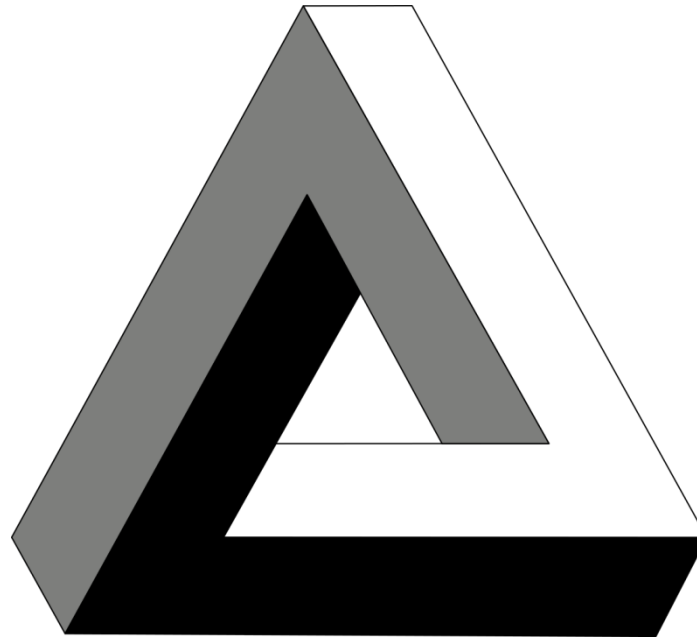
See also Hallegatte et al. (2013, Nature Climate Change)

EU legislation

- Floods Directive requires Member States to assess flood risks for all water courses and coastlines, and take measures to reduce flood risks.
- EC's initiative on marine spatial planning and integrated coastal management requires the establishment of coastal management strategies to protect against future threats to coastal areas, including climate change and flooding.

Coastal zone management

Climate Change



Livelihood ↔ **Safety**



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Options

- Ecosystem based adaptation
- Building with nature (e.g. sand engine)
- Multi-functional dikes
- ...

Warming of Indian Ocean may weaken monsoon: Study

Neha Madaan, TNN | Oct 3, 2014, 04:55AM IST

Roxy et al. 2014. Journal of Climate

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PUNE: A recently published study says the Indian Ocean has been warming consistently for over a century and at a faster rate than any other region of tropical oceans — and this may weaken the monsoon.

The study by scientists from Pune's Indian Institute of Tropical Meteorology (IITM), Sorbonne University in Paris and Pune's Fergusson College found the warming of the Indian Ocean has been a major contributor to the total global sea surface warming, which may have long-term effects on the climate such as weakening the southwest monsoon and being detrimental to marine biodiversity.

Global ocean surface warming has long-term effects on the climate since it persists for a longer time compared with land temperatures.

See also MareClim workshop 2013.

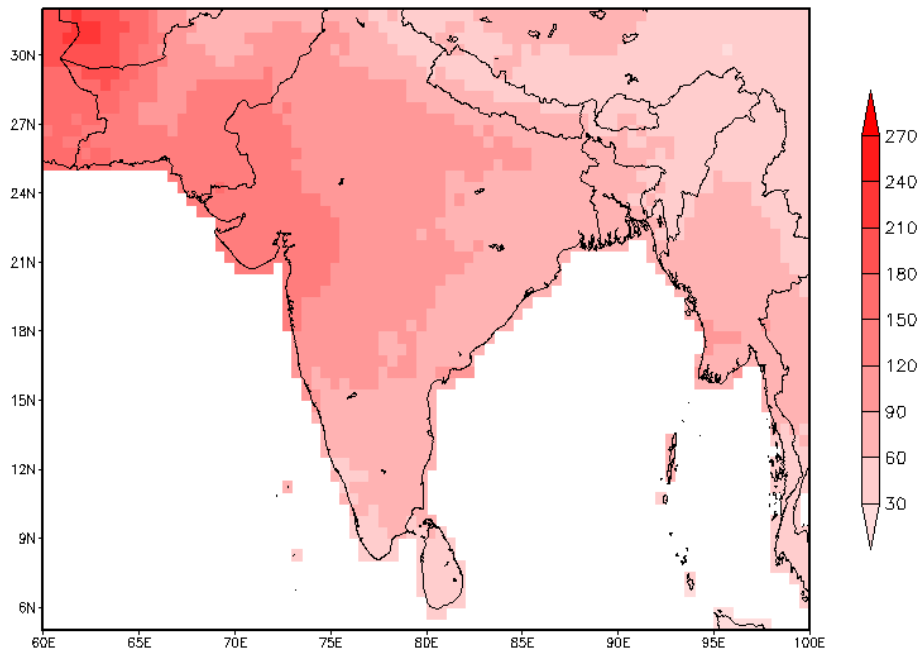


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Average length of periods with continuous dry days

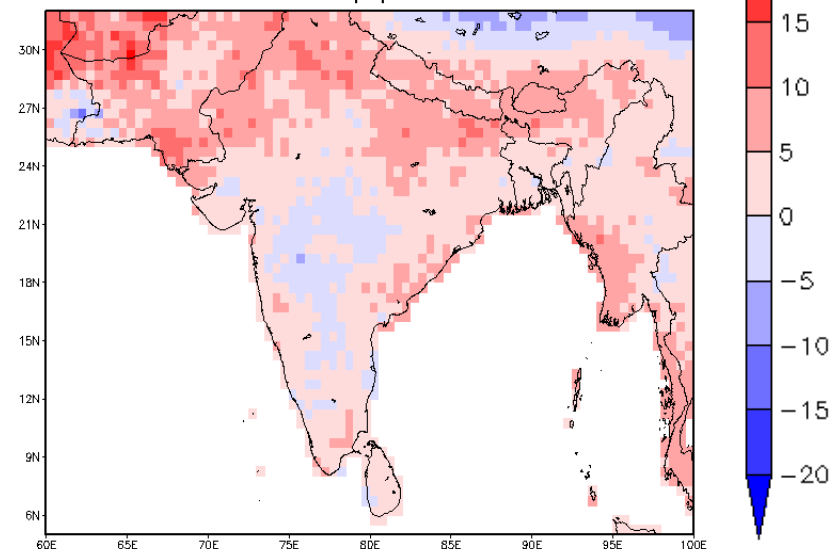
1970–1999

Avg. length largest cdd period 1970–1999



2036–2065 vs 1970–1999

Avg. delta length largest cdd period 2036–2065 vs 1970–1999:
rcp8p5



Climate variability and oceanic fish stocks?

- Marine fisheries are facing increasing pressure on a global scale from a.o.:
 - widespread overfishing,
 - habitat destruction,
 - climate change.
- The effects of exploitation are to increase the sensitivity of individual marine fisheries species to the impacts of climate variability and change by removing individuals that alter the genetic variability and composition within the population (Salinger, 2013. Climatic Change)

Future changes in fish catch

Antarctic fish might survive ocean warming: Study

IANIS | Jul 24, 2014, 09:18PM IST



WELLINGTON: A species of Antarctic fish might be able to survive the predicted warming of its native waters over the next century if the warming is gradual enough, according to a New Zealand scientist.

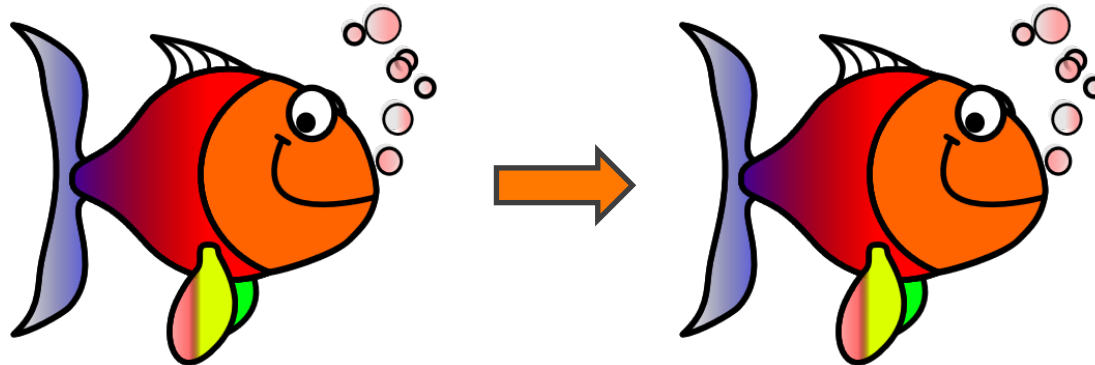
University of Canterbury researcher Charlotte Austin tested how the emerald rock cod adapted to warmer waters after being removed from its minus 1.9-degree centigrade habitat below the Antarctic ice, Xinhua reported.

The fish were able to fully recover from short exposures to temperatures up to 6 degrees centigrade, but long periods of time at 4 degrees centigrade was fatal, Austin said in a statement Thursday.

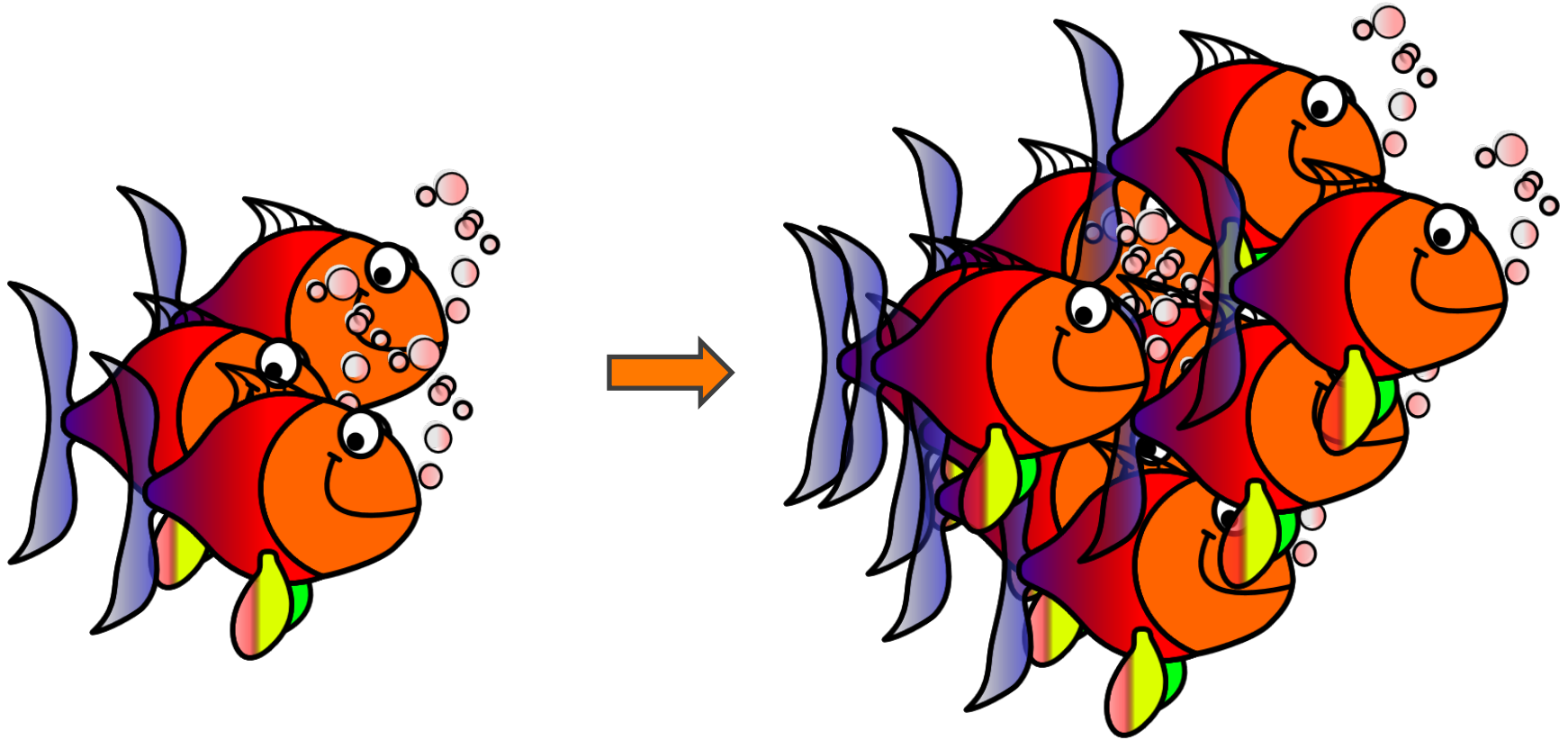


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What will the future bring us?



What will the future bring us?



Perceptions



See e.g.:
<http://psych.la.psu.edu/clip/Perception.htm>

Comparing SF Bay area - Netherlands Institutional arrangements

- “How do cultural and political differences shape attitudes toward flood protection and climate change adaptation?”



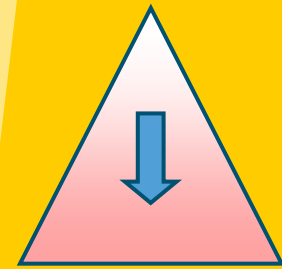
Comparing SF Bay area - Netherlands

Strength, Weaknesses, Opportunities and Threats

Strengths



Weaknesses



Opportunities



Threats

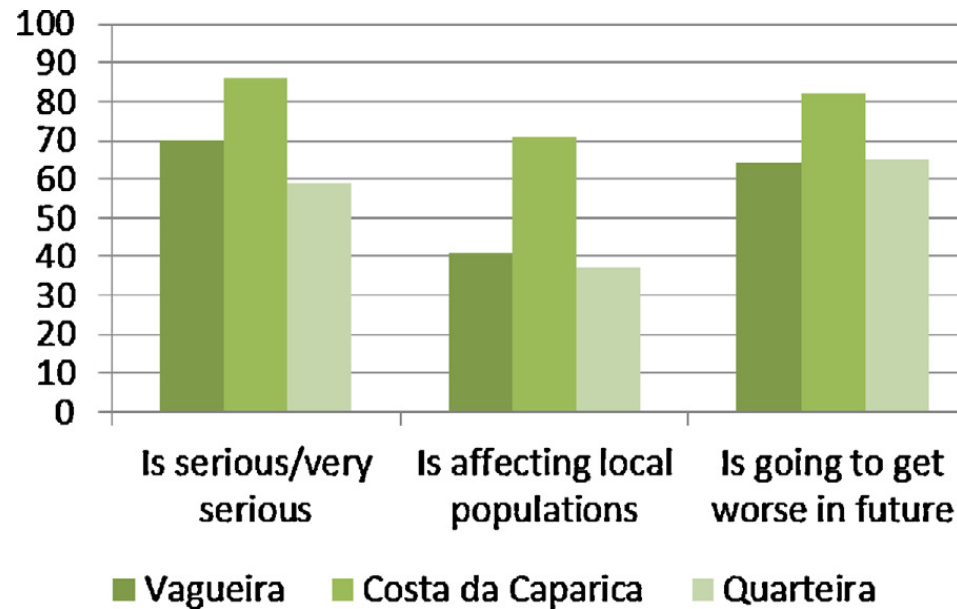


Perception of coastal erosion in Portugal

- 3 case studies in Portugal

- Interviews with:

Local, regional and central authorities, port and marine authorities, scientists, resident associations, companies and business associations, beach restaurants associations, surfers, fishermen and NGOs.

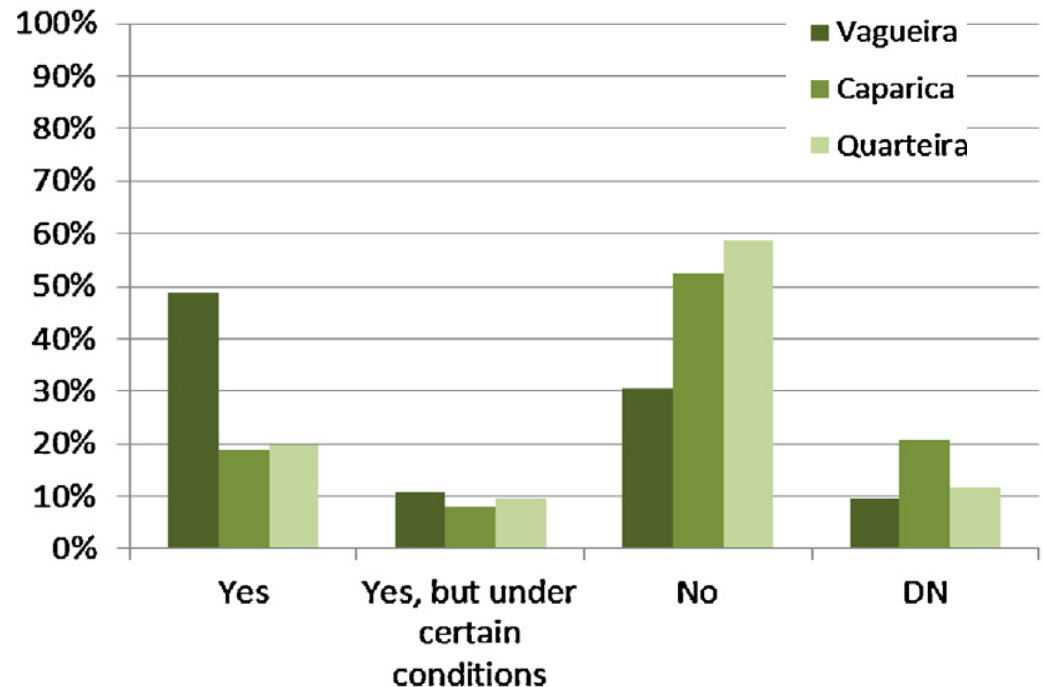


Willingness to contribute

Disconnection between the “top” and the “bottom” of coastal management decision-making processes



General distrust and blocked communication between local stakeholders and institutions in charge of coastal management.



Understanding stakeholder views

- Hattam et al (2014, Marine Policy) showed for the UK that decisions to protect biodiversity inevitably come with trade-offs, many of these trade-offs are social in nature and the distribution of social costs is not equal across stakeholder groups.
- Impact assessments for the MCZ network tend to focus on the economic implications for different industry sectors and ecosystem services; no mention of social impacts is made.
- Given the recognised importance of the social dimension to the acceptance and success of MPAs, this appears to be a considerable oversight.

Social implications

- Social drivers: income, security, quality of life , education, ...
- Results from Madagascar showed that the small-scale fisheries sector employs 87% of the adult population, generates an average of 82% of all household income, and provides the sole protein source in 99% of all household meals with protein. (Barnes-Mauthe et al., 2013. Fisheries Research).

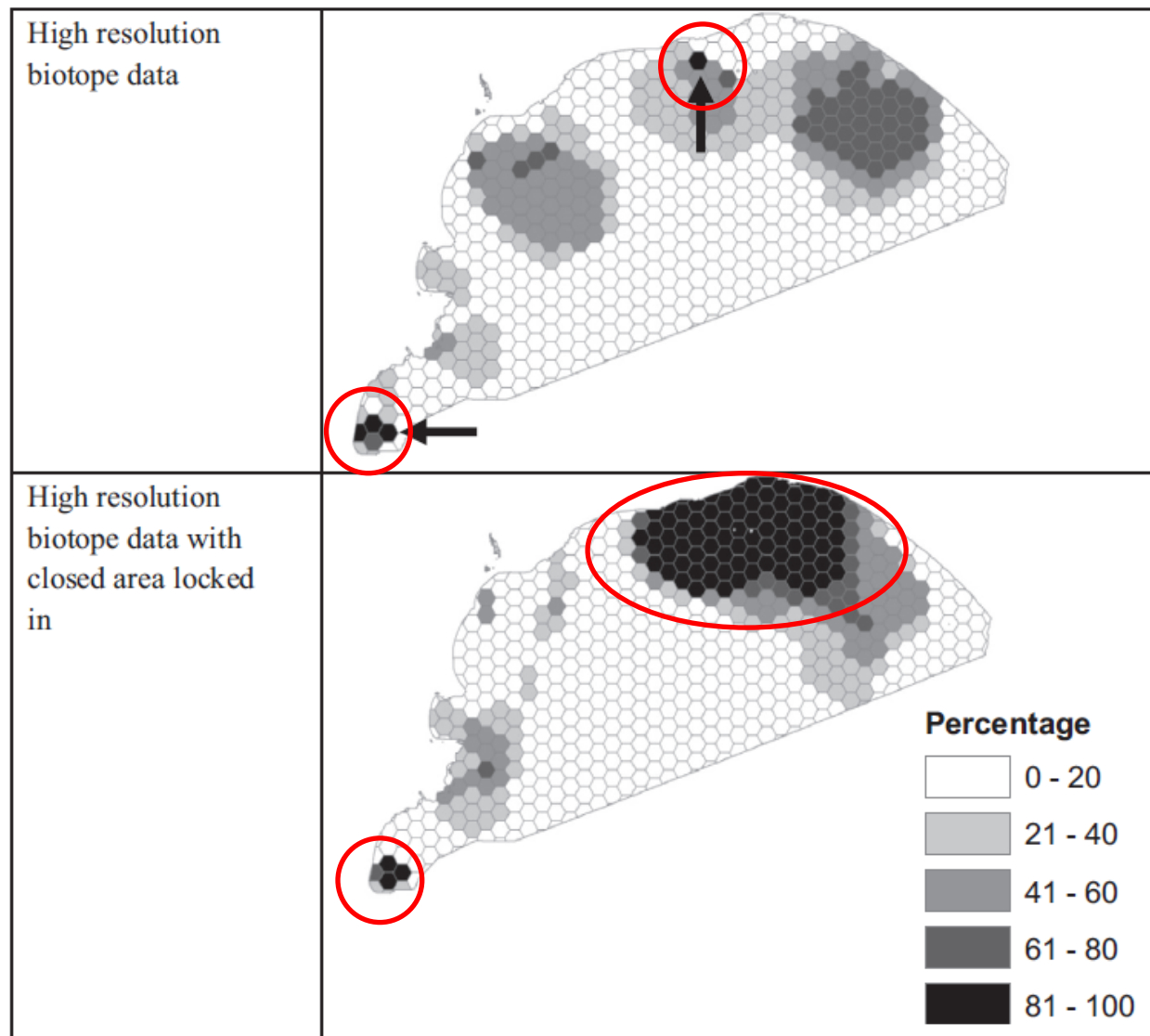
Science in marine governance

- The experience of the MRE (Marine Renewable Energy) industry with existing EIA frameworks suggest that substantial reform is required if the economic, social and environmental goals of the 'Blue Economy' agenda are to be adequately balanced. → Risk based approach
- It is essential that innovative new marine based technologies are supported by complementary regulatory frameworks and strong scientific evidence as to their environmental interactions.
- Deploy and Monitor

Data needs

Objective function:

- minimise area incorporated,
- length boundary around protected area and
- penalty for elements (e.g. biotopes) not included in this area.



Data needs

- This suggests that when designing networks of marine protected area sites, including current protected areas may be inefficient, resulting in larger areas being protected with no increased conservation of marine biodiversity. Policymakers must be prepared to adapt management in light of these findings and be aware of the shortcomings of the data available for use in marine conservation planning. (Peckett et al., 2014. Marine Policy)
- Involve local stakeholders (e.g. NGOs) in data collection, ensure adaptability of policies based on new data.

Knowledge and research needs

- Knowledge is needed to support the development and continuous updates of coastal zone management strategies.
- Lack of data (especially on small scale fisheries)
- What are sustainable levels?
- How to manage future changes?
- How to improve stakeholder participation?

Knowledge and research needs

- A shared social and institutional awareness.
- A credible cooperative knowledge grounded in a better understanding of the causes of past failures in coastal planning and illegal settlement in danger zones, appreciation of the conditions for improved participation, and more coherent coastal cooperation by the relevant agencies involved (Schmidt et al., 2014. Land use policy)
- Inclusion of social impacts in impact assessments (not only focus on the economic implications for different industry sectors and ecosystem services) Hattam et al., 2014

Implementation needs

EoI. No. 43- ICZMP-Odisha /2014-15

Date: August 27, 2014

To formulate **Integrated Coastal Zone Management** (ICZM) Plan based on the sediment cells, falling between the coastal stretches of Gopalpur to Chilika & Paradip to Dhamra with focus on providing a clear framework for better coordination of the developmental activities along the coastal stretch through strategic actions and sustainable policies for effective management of the coastal zone to enhance socio-economic improvement of its population while keeping its natural resources and the environment healthy and capable of sustaining future generation, including the impact from climate changes.

Summary

- Increase livelihood by better understanding of historic changes to improve our capacity to deal with future changes
 - Develop alternatives (spatial planning)
 - Safe guarding (emergency) infrastructure
 - Improved stakeholder understanding and participation
- Continuous adaptation of ICZM strategies
- Community based monitoring



Valorisation of your input to the

India-EU Workshop on Coastal Zone Management and Impact on Society

6th -9th October 2014

- 1) What do you consider the most important societal impact for coastal zone communities?
- 2) What research/knowledge is urgently needed to address this challenge from your perspective?

Thank you for your valuable input,

Professor N.R. Menon

Professor Eddy Moors

Thank you

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