Caribbean Sea Ecosystem Assessment
CARSEA

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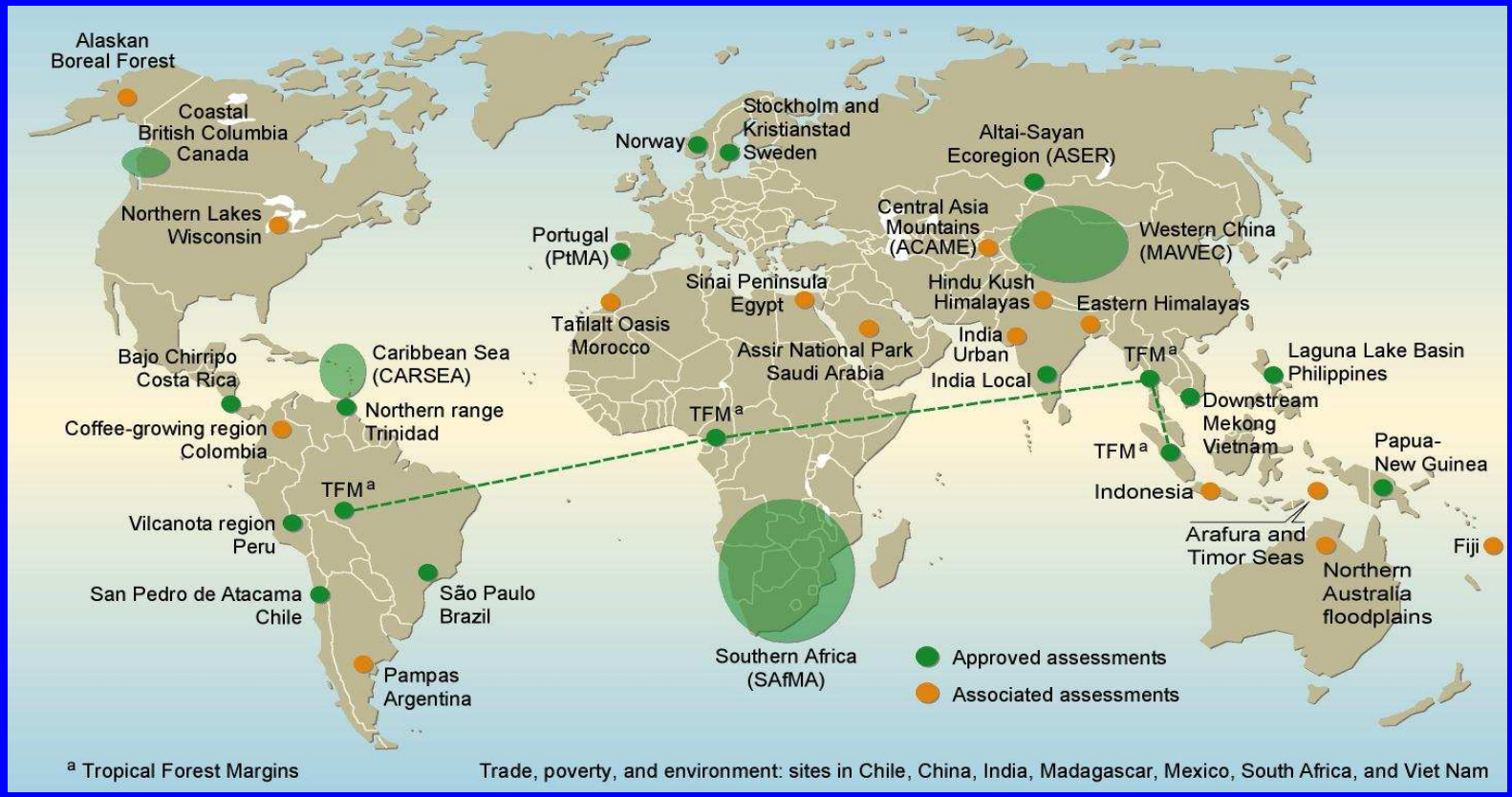
Defining Features

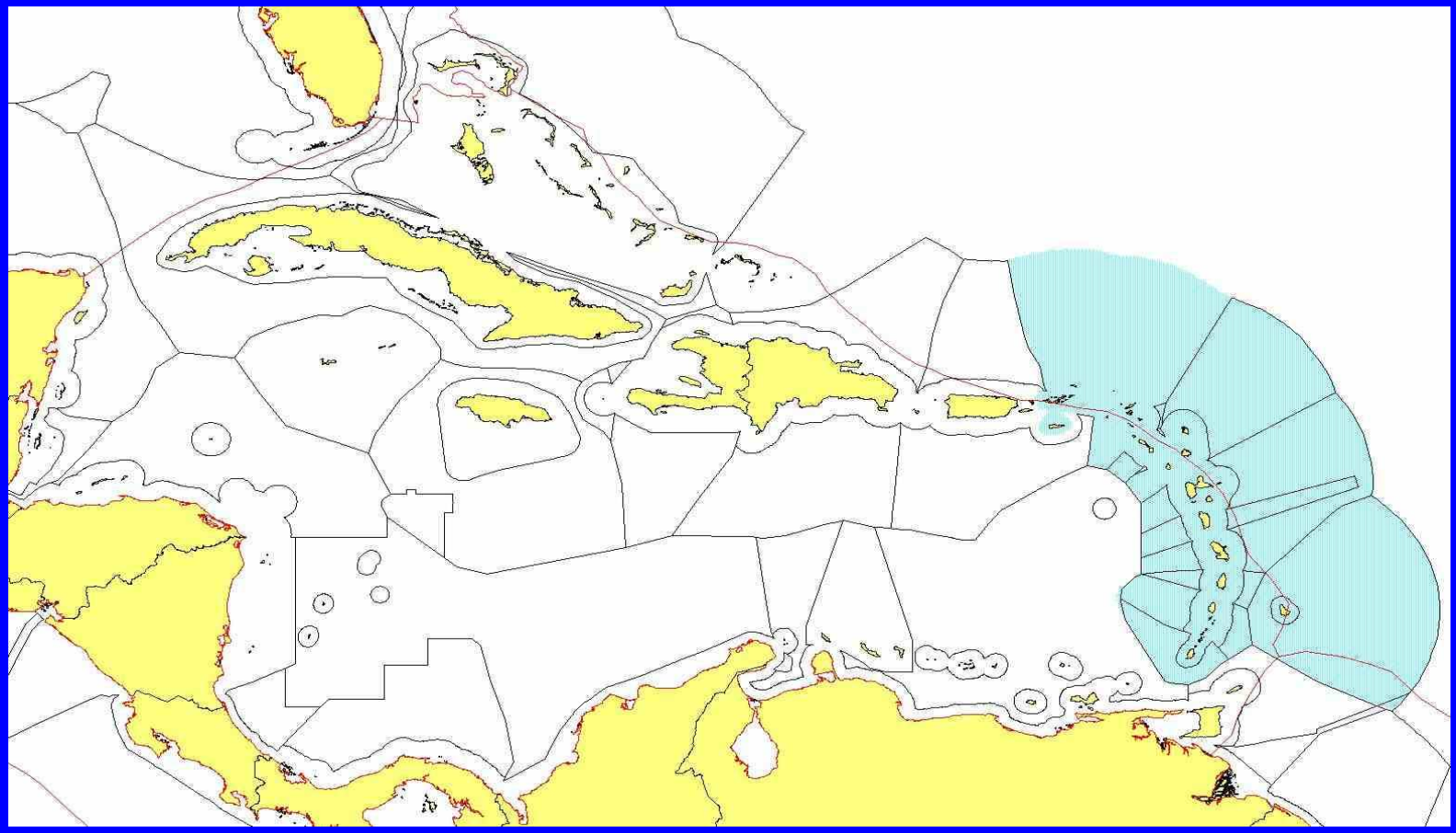
- CARSEA is one of 33 sub-global assessments that wass part of the global Millennium Ecosystem Assessment (MA) launched by the UN Secretary General in 2001



CARSEA

WHAT IS THE PROBLEM BEING ADDRESSED?

-THE CARIBBEAN SEA IS DIFFICULT TO MANAGE AS A SINGLE LARGE MARINE ECOSYSTEM BECAUSE IT IS IMPACTED BY A COMPLICATED AMALGAM OF STAKEHOLDERS FROM WITHIN AND OUTSIDE THE REGION



WHAT ARE THE GOALS?

- to advance the operationalization of the Caribbean Sea Commission of the ACS as it develops a holistic governance framework that will enable all stakeholders to contribute to managing the Caribbean Sea in a manner that will maintain its goods and services that are essential to human well-being

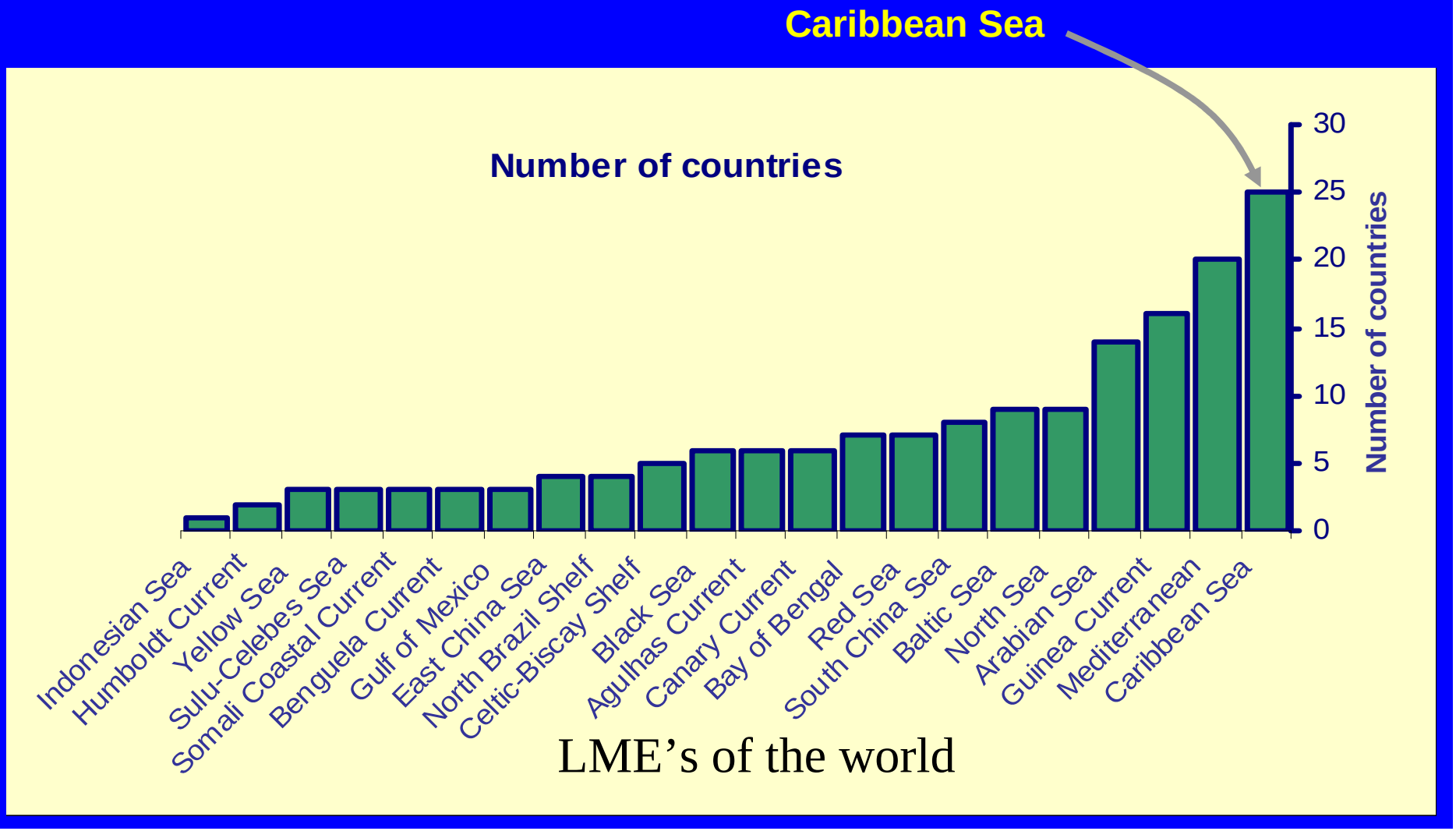
- to contribute to the implementation of Resolution 57/261 of the UN General Assembly on 20 December 2003 "**Promoting an integrated management approach to the Caribbean Sea area in the context of sustainable development**"

WHAT ARE THE OBJECTIVES?

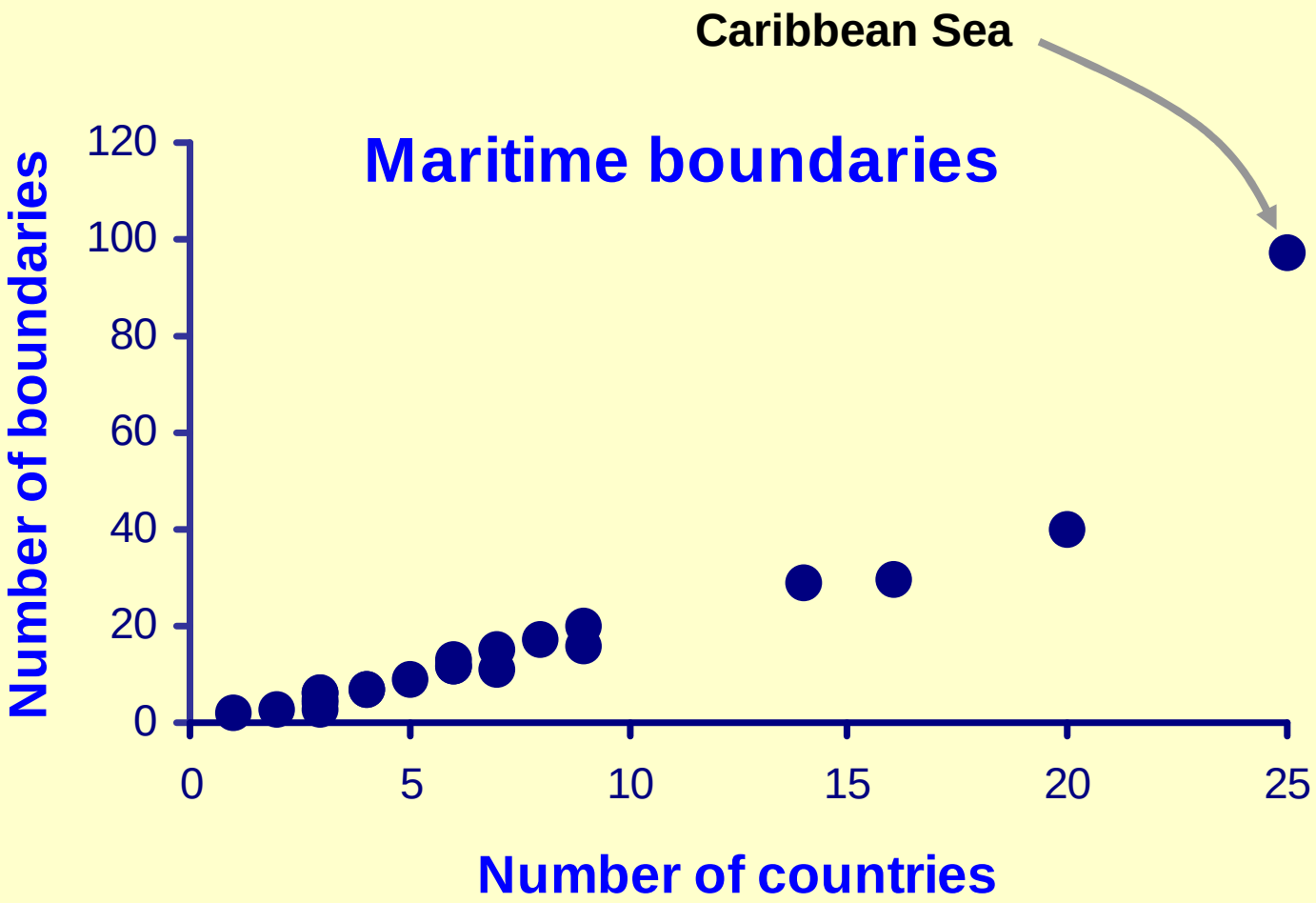
- to advance the case for the recognition of the Caribbean Sea by the international community as a "**Special Area in the context of Sustainable Development**" which is on the agenda of the UN General Assembly in 2008.

THE ARGUMENT IN BRIEF:

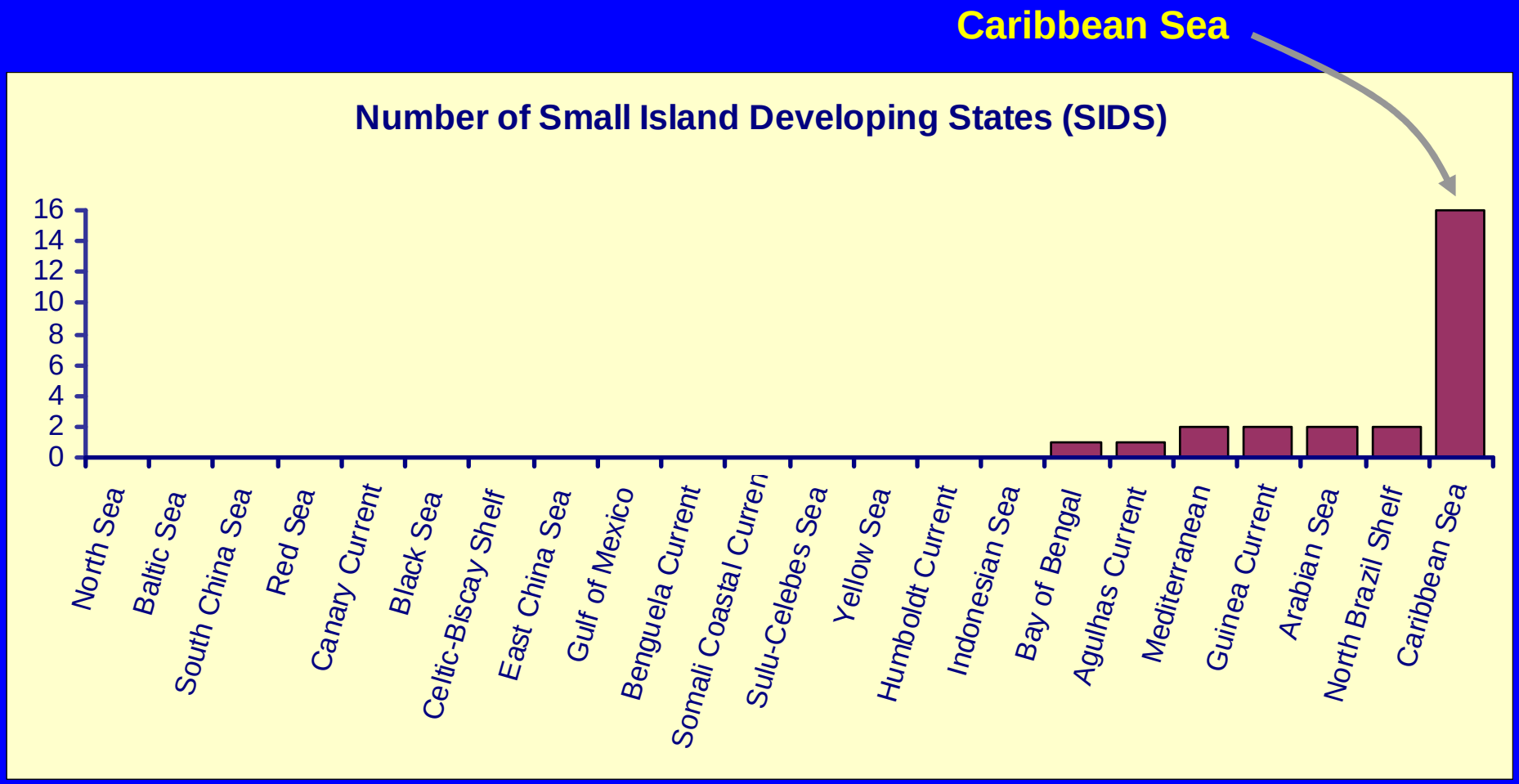
The Caribbean Sea is special because it has <u>the most Geopolitical components of complexity</u> of any Large Marine Ecosystem (LME) in the world



The Caribbean Sea is special because it has the highest number of maritime boundaries of any LME in the world

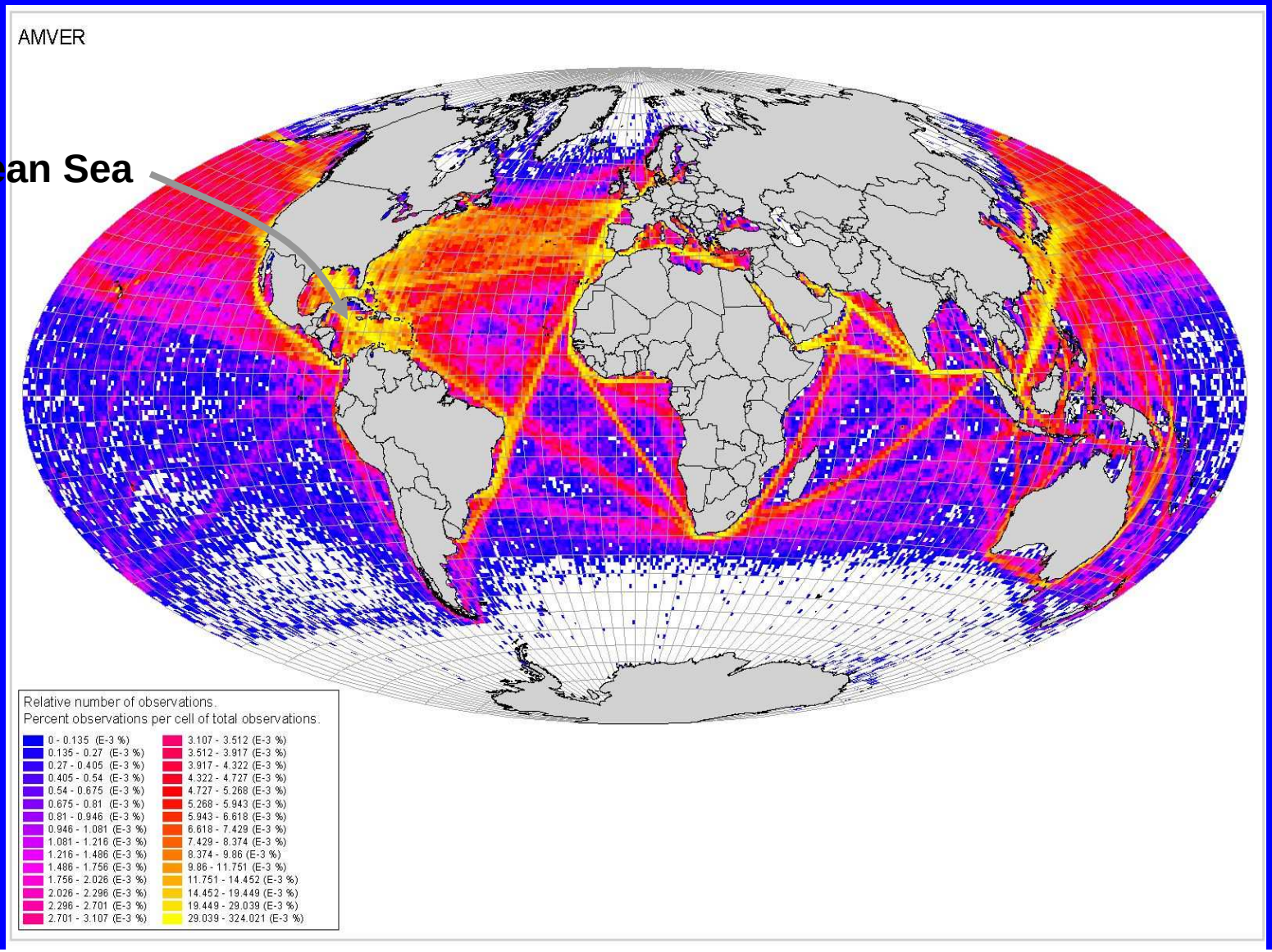


The Caribbean Sea is special because it has the largest number of Small Island Developing States of any LME in the world



The Caribbean Sea is one of the busiest shipping regions in the world

(yellow areas show highest number of ship observations by the International Maritime Organisation (IMO))



WHAT ARE THE GOALS?

- to advance the case for developing a holistic governance framework that will enable all the stakeholders to contribute to managing the Caribbean Sea in a manner that will maintain its goods and services that are essential to human well-being

- to contribute to the implementation of Resolution 57/261 of the UN General Assembly on 20 December 2003 "**Promoting an integrated management approach to the Caribbean Sea area in the context of sustainable development**"

WHAT ARE THE OBJECTIVES?

- to examine whether there is scientific support for the recognition of the Caribbean Sea by the international community as a "**Special Area in the context of Sustainable Development**" which was on the agenda of the UN General Assembly in 2003 and 2006.

Human Well-being and Poverty Reduction

- Basic material for a good life
- Health
- Good Social Relations
- Security
- Freedom of choice and action

Indirect Drivers of Change

- Demographic
- Economic *(globalization, trade, market and policy framework)*
- Sociopolitical *(governance and institutional framework)*
- Science and Technology
- Cultural and Religious

Ecosystem Services

Direct Drivers of Change

- Changes in land use
- Species introduction or removal
- Technology adaptation and use
- External inputs *(e.g., pollution)*
- Resource consumption
- Climate change
- Natural physical and biological drivers *(e.g., hurricanes)*

POTENTIAL ECOSYSTEM SERVICES FROM THE CARIBBEAN SEA

Provisioning

Goods produced or provided by ecosystems.

- Food e.g. fish
- Freshwater
- Biochemical's

Regulating

Benefits obtained from regulation of ecosystem processes

- Climate regulation
- Disease control
- Detoxification

Cultural

Non-material benefits obtained from ecosystems

- Recreational
- Aesthetic
- Inspirational
- Educational

Supporting

Services that maintain the condition for life in the sea
Nutrient cycling
e.g. mangroves, coral reefs, plankton

WHAT IS THE CONTENT OF THE PROJECT ?

Through exploring the guiding questions the CARSEA project has attempted to :

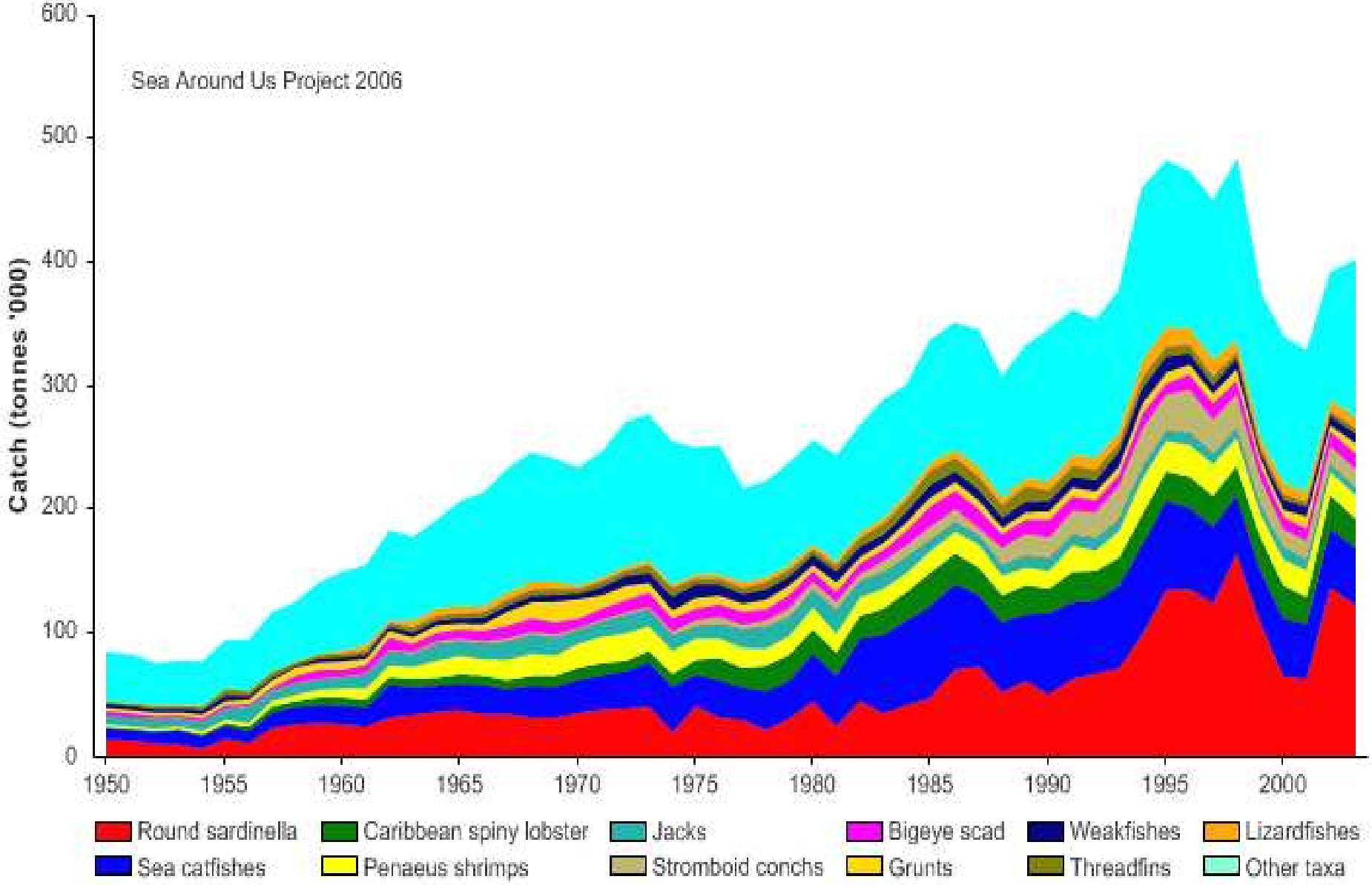
- **document the condition and trends of Caribbean Sea ecosystems**
- **explore plausible scenarios making use of various storylines about likely events and realistic assumptions**
- **consider a range of possible responses**

Assessment Outline

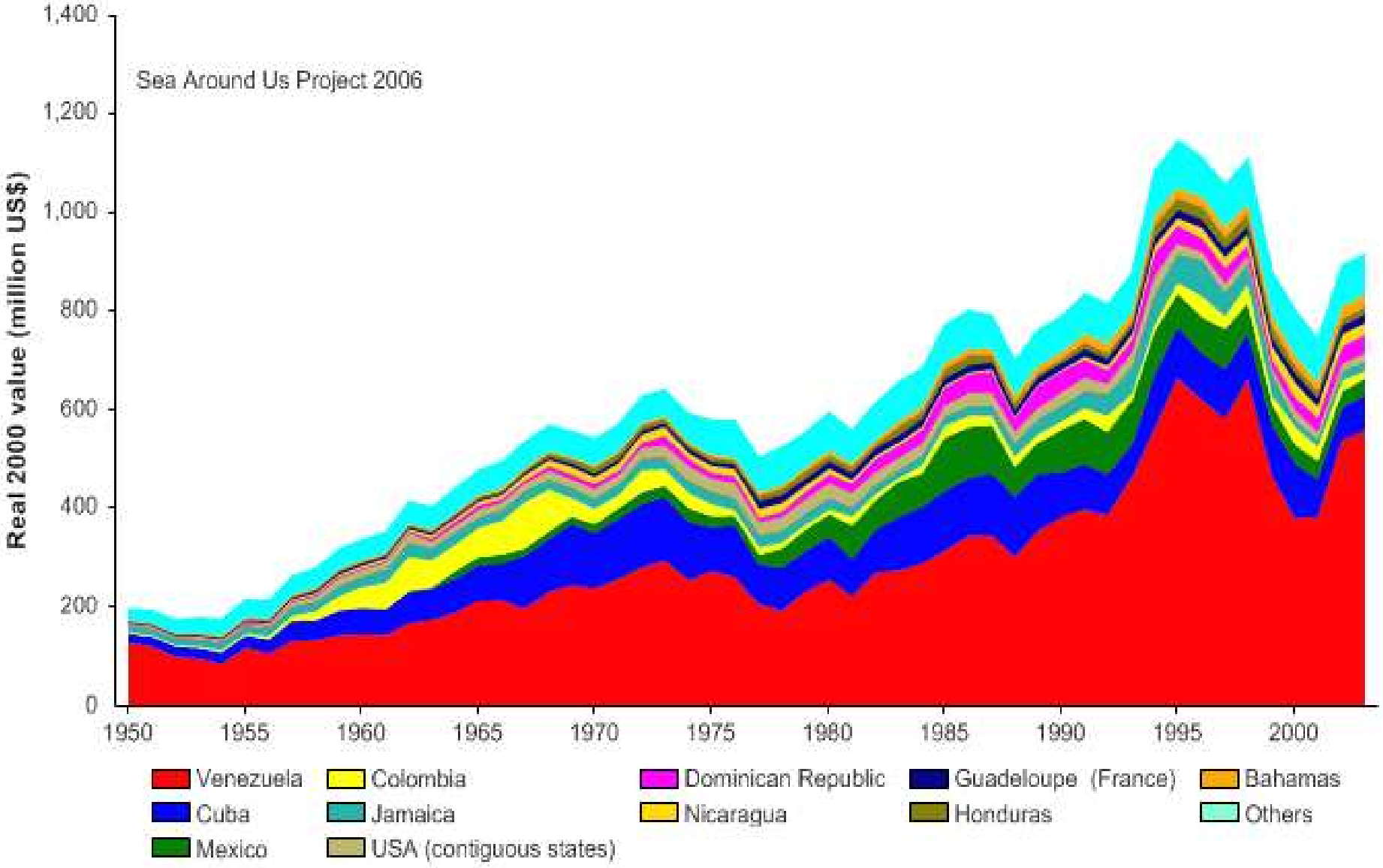
1. Conditions and Trends Assessment
    1. Fish production 1950-2006
    2. Amenity value (e.g. Tourism) 1990-2003
    3. Biodiversity
        - -Coral reef cover 1977-2002
        - -Mangrove cover 1990-2000
2. Scenarios present to 2050
3. Response Options

Findings of Fact # 1:

FISH CATCHES HAVE BEEN DECLINING SINCE 1998



The Caribbean Sea fish catch is worth about 1 billion US$ per annum



Findings of Fact # 2:

THE MEAN TROPHIC LEVEL OF THE CARIBBEAN SEA HAS BEEN DECLINING SINCE 1956

Findings of Fact # 3:

FISH CATCH PER UNIT EFFORT (CPUE) HAS DECLINED SIGNIFICANTLY IN THE SOUTH-EASTERN CARIBBEAN SINCE 1980.

Fishery Statistic	Grenada & Grenadines	St Lucia	St Vincent & Grenadines	Barbados
Inshore				
Catch (tonnes)	-12	+36	+64	+16
Effort (10^3 Hp-days)	+42	+133	+4	+134
CPUE (tonnes per 10^3 Hp-days)	**-38**	**-24**	**+58**	**-71**
Offshore				
Catch (tonnes)	+129	+143	-29	+36
Effort (10^3 Hp-days)	+598	+513	+170	+339
CPUE	**-67**	**-65**	**-52**	**-69**

Findings of fact # 4:

Fisheries jobs, income and fish protein

- 504,913 jobs
- >US$1 billion in exports
- 7% of total protein consumption in Caribbean

Findings of fact:
Amenity Value, Tourism Jobs and Income

THE INSULAR CARIBBEAN IS THE MOST DEPENDENT REGION IN THE WORLD ON TOURISM RELATIVE TO ITS SIZE

- Direct impact:
- 567,870 jobs
- US$ 6.5 billion contribution to GDP
- Indirect impact:
- 1,857,000 jobs (12% of total employment)
- US 23.1 billion contribution to GDP (13% of total GDP **(#1 in the world relative to size)**

Ranking of Insular Caribbean Tourism compared to the rest of the world

Caribbean	2003	2013
	Relative Size	Relative Size
Personal & Travel Tourism	9	8
Government Expenditures	1	1
Capital Investment	1	1
Visitor Exports	2	2
Economy GDP	1	1
Economy Employment	3	1

[1]Total 13 Regions (161 countries). Best is number 1, worst is number 13

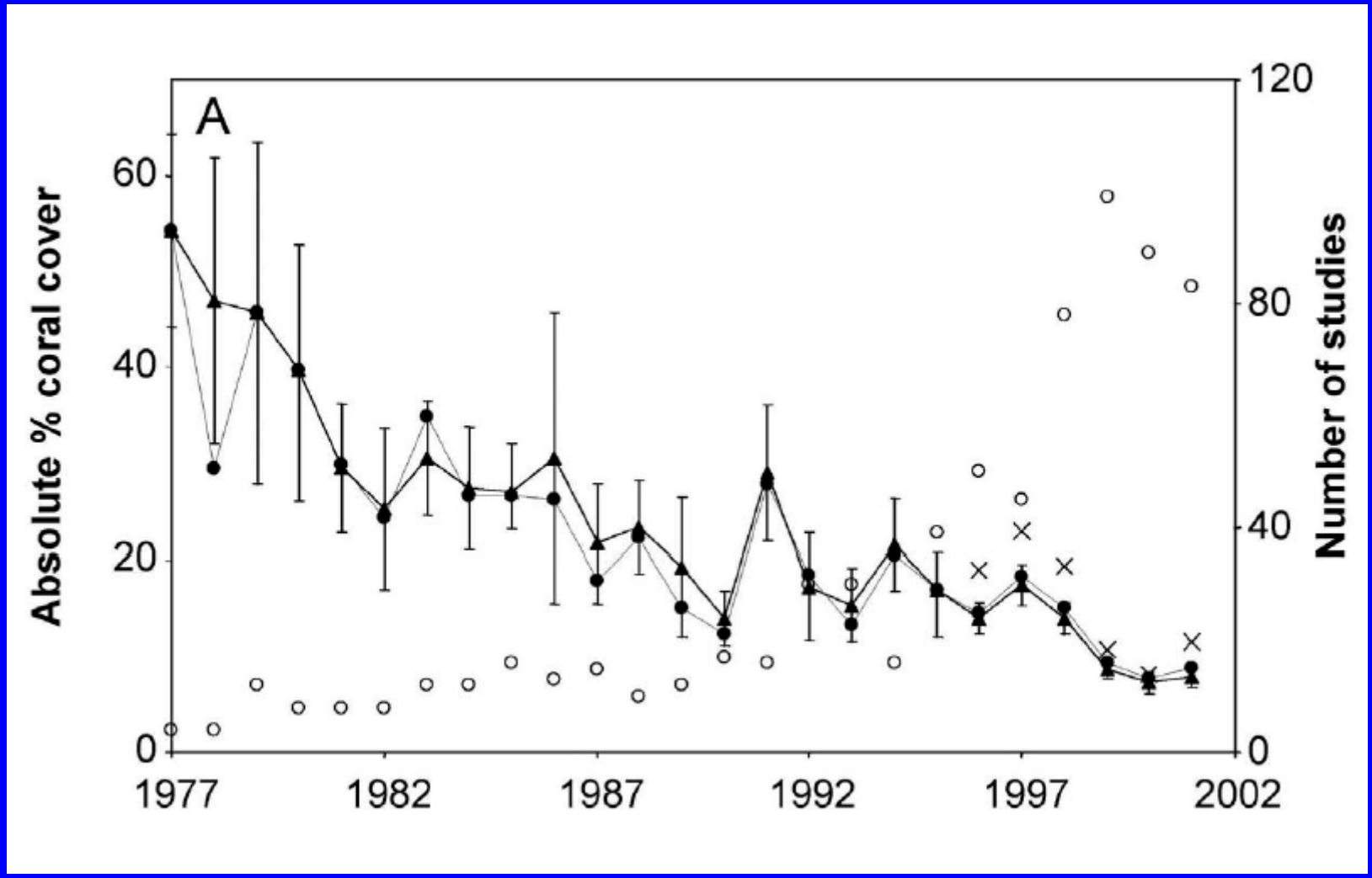
[2]Includes 23 insular Caribbean countries only.

(adapted from World Tourism and Travel Council http://www.wttc.org/ (sub-menu: TSA Accounts, World Reports, Caribbean) accessed Nov. 17, 2003;

BIODIVERSITY:

Long-term region-wide declines in Caribbean coral cover

(Gardner et al., Science express 2003)



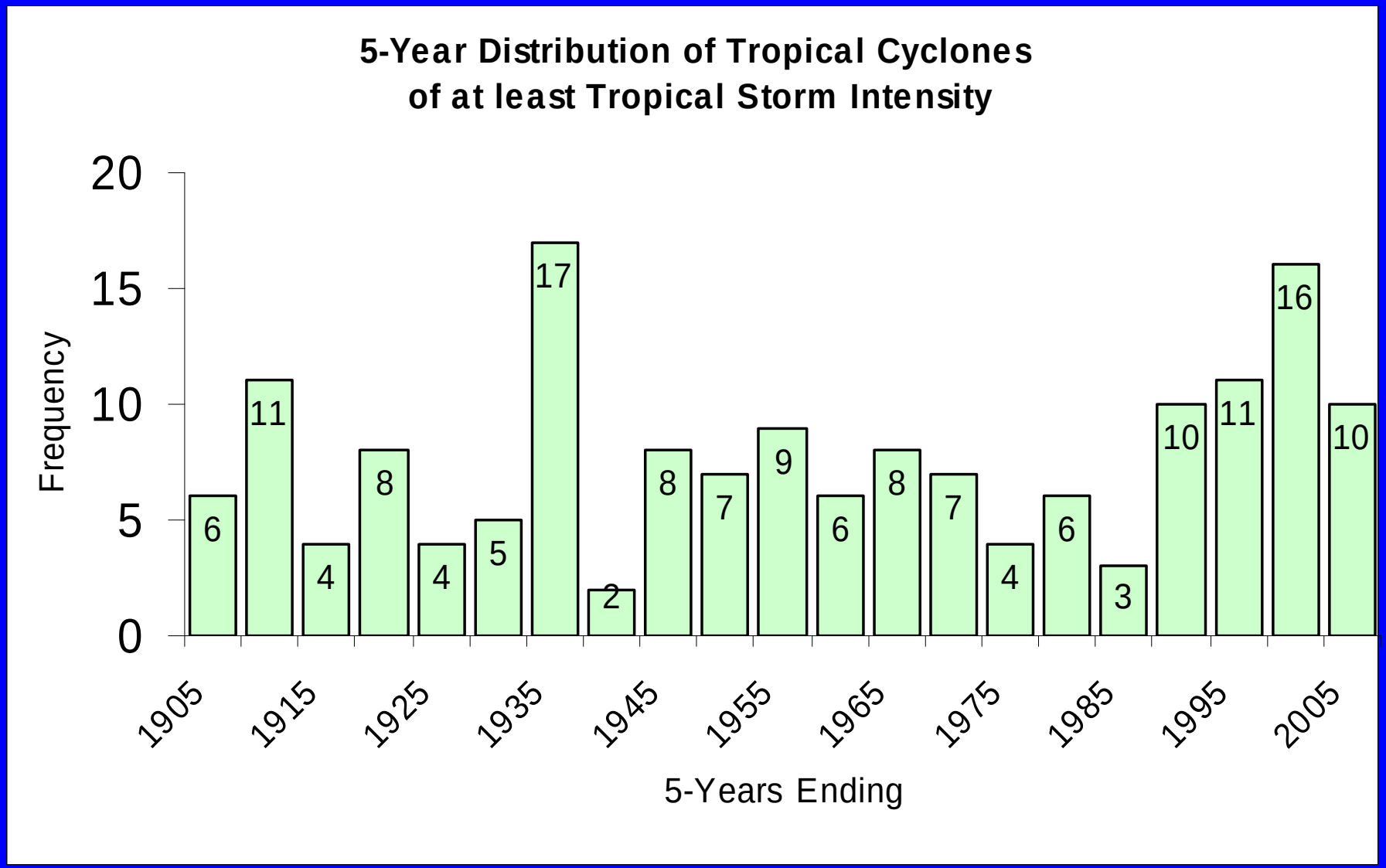
What are the consequences of the decline in Caribbean coral cover for human wellbeing?

Summary Of Estimated Values Of Selected Goods And Services Derived From Coral Reefs In The Caribbean (2000) And Estimated Potential Losses Due To Coral Reef Degradation (By 2015 And 2050) (after WRI , 2005)

Good/Service	Estimated Annual Value in 2000 US$	Estimated Future Annual Losses Due to Coral Reef Degradation
Fisheries	312 million	loss of annual net benefits valued at US$11-140 million
Tourism and Recreation	2.1 billion	region-wide loss of annual net benefits valued at an estimated US$100-300 million
Shoreline Protection	0.7 - 2.2 billion	The estimated value of lost annual net benefits is estimated at US$140-420 million
TOTAL	**3.1 - 4.6 billion**	**US$350-870 million**

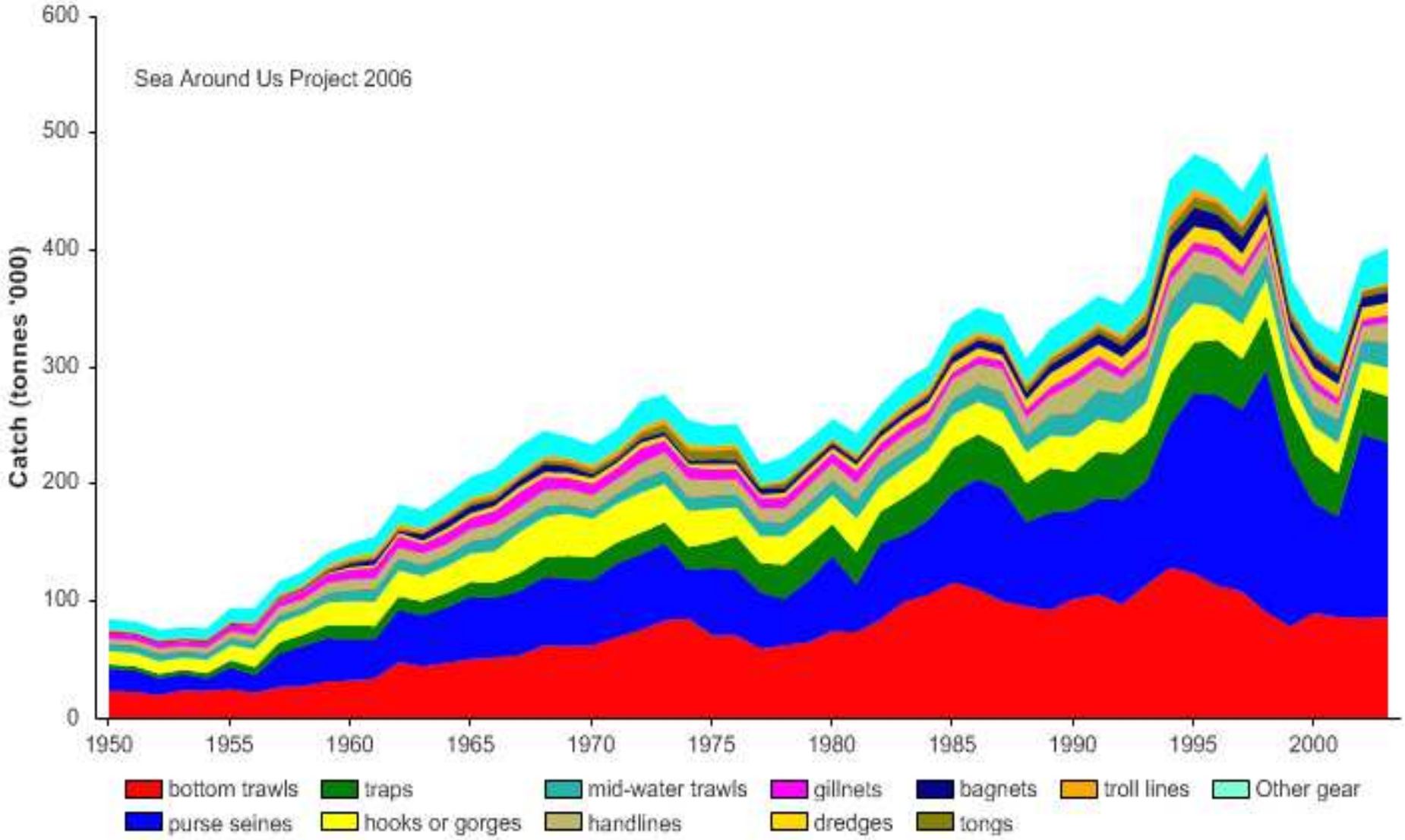
Direct Drivers: CLIMATE VARIABILITY AND CHANGE

Tropical Cyclone activity in the Caribbean 1901-2000



DIRECT DRIVERS:

FISH CATCHES BY FISHING GEAR USED



Four Scenarios for the Caribbean Sea

- Neo-Plantation economy
  - Exploitation, short-term gain vs long-term costs
- Quality over Quantity
  - 'know your own limits', Niche tourism
- Diversify Together
  - Regional Cooperation and diversification
- Growing Asymmetries
  - Selective permeability, FTAA

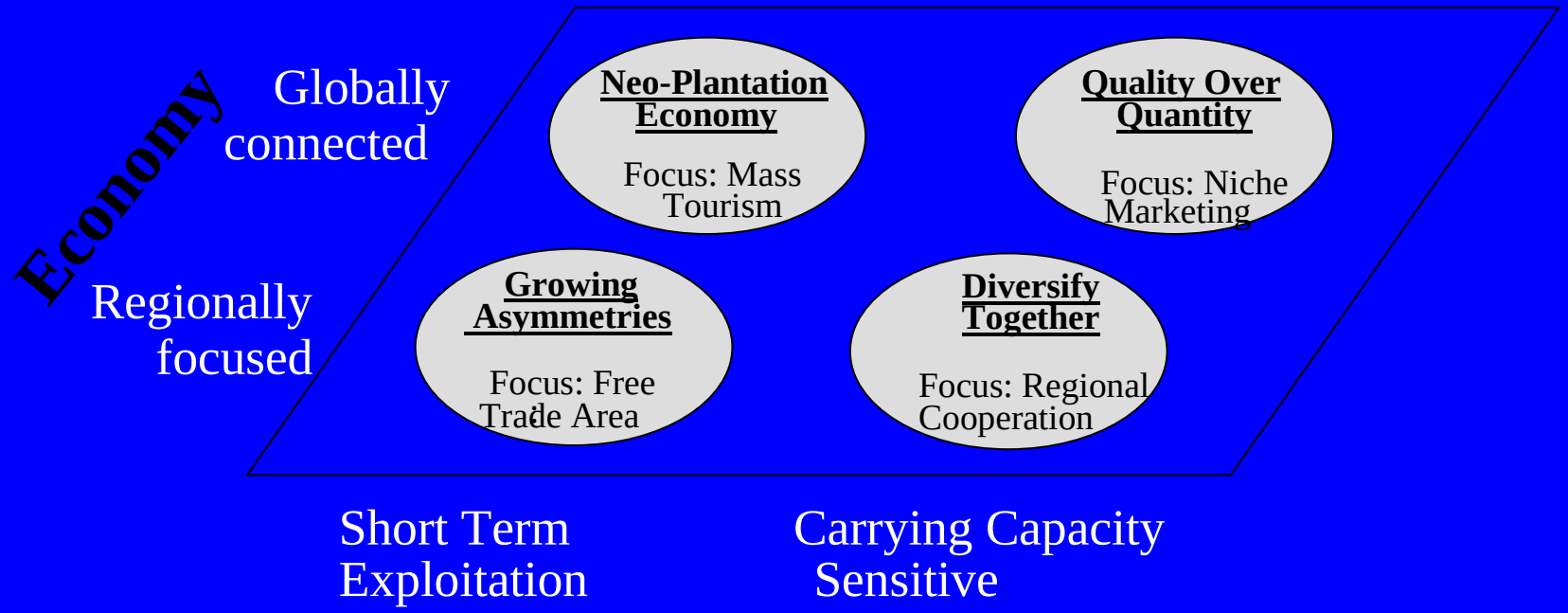
Exploring uncertainty with Scenarios -Focal questions

- What governance mechanisms for the Caribbean Sea can be used to reduce economic, social and environmental vulnerability of the region

- How can economic activity be organized and managed so that natural resource benefits are distributed equitably relative to the costs?

- Will current trends in the decline of Caribbean Sea coastal and marine ecosystems exceed ecological thresholds that may result in significant consequences for human well-being?

CARSEA
Scenario Storylines



Approach to ecosystem services

Major Findings:

- -Only the Quality over Quantity Scenario benefits ecosystems through its explicit policies and institutions to address the environment, otherwise high negative impacts on ecosystems are likely.

How have we been responding?

- Many programmes, projects, policies

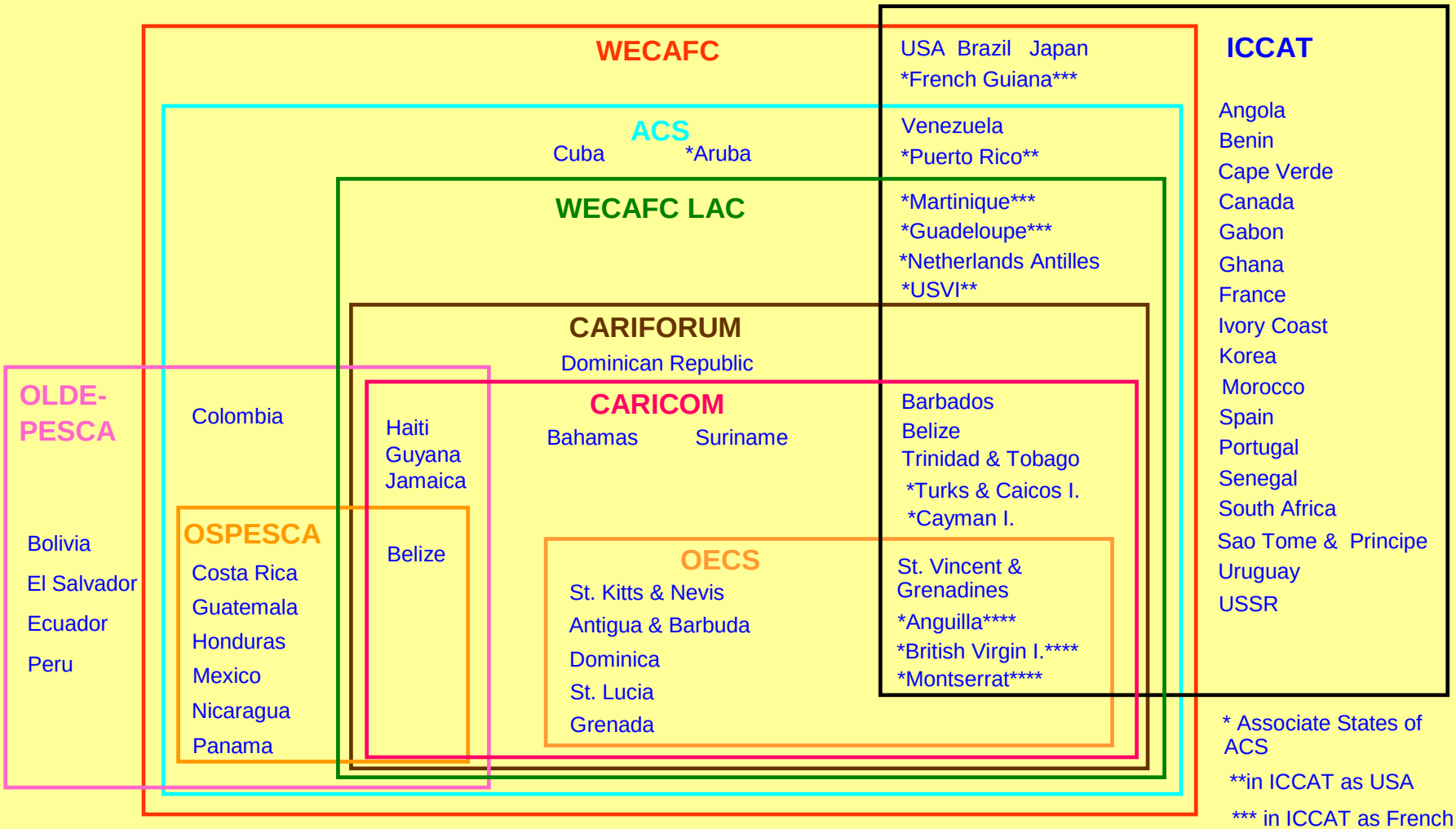
BUT

- not adequate in achieving sustainable management of the sea

WHY?

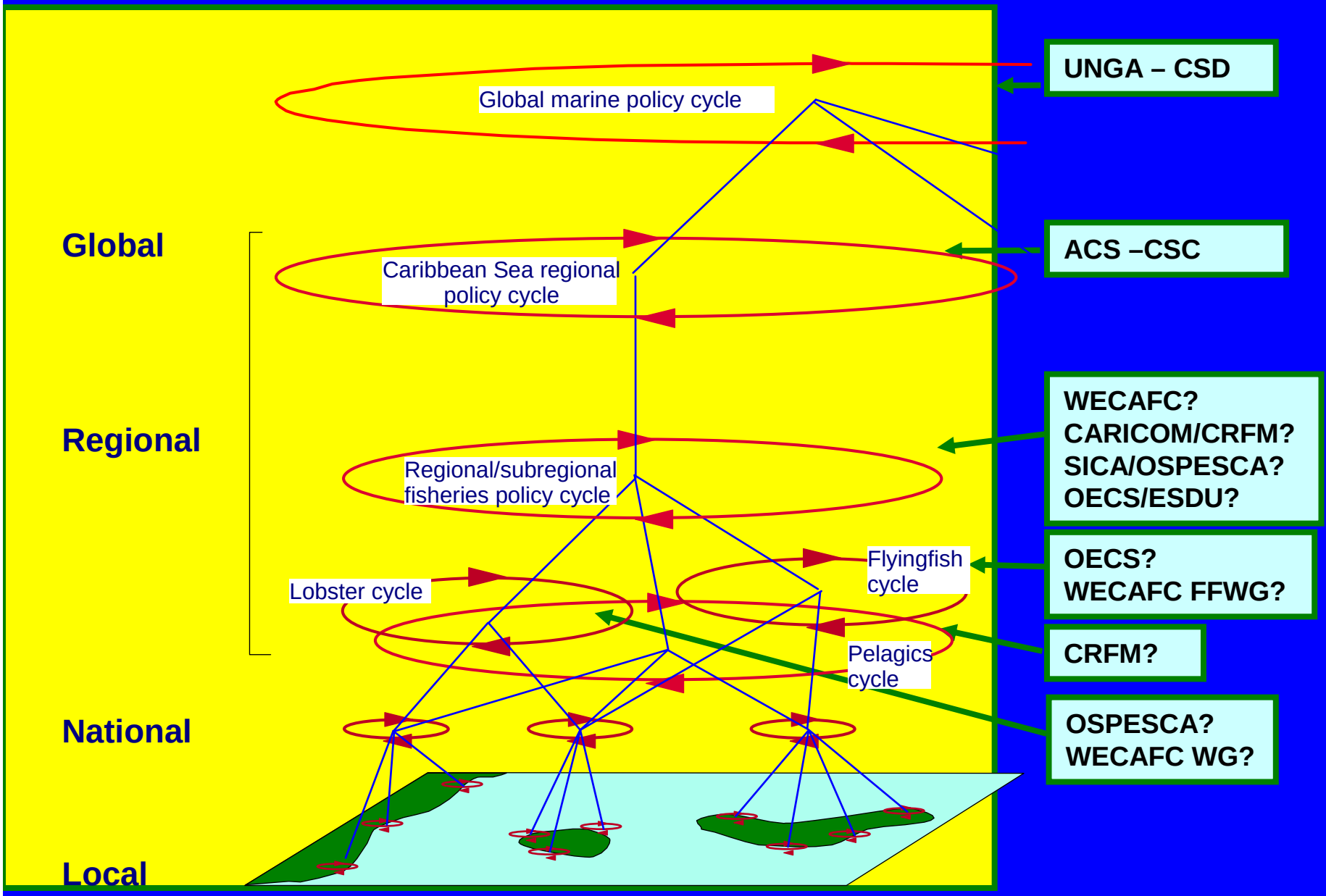
- disconnected programmes/lack of cooperation
- ineffective legislation
- poor commitment

For example look at the overlapping and nested fisheries related organisations in the Caribbean Sea



Source: Robin Mahon

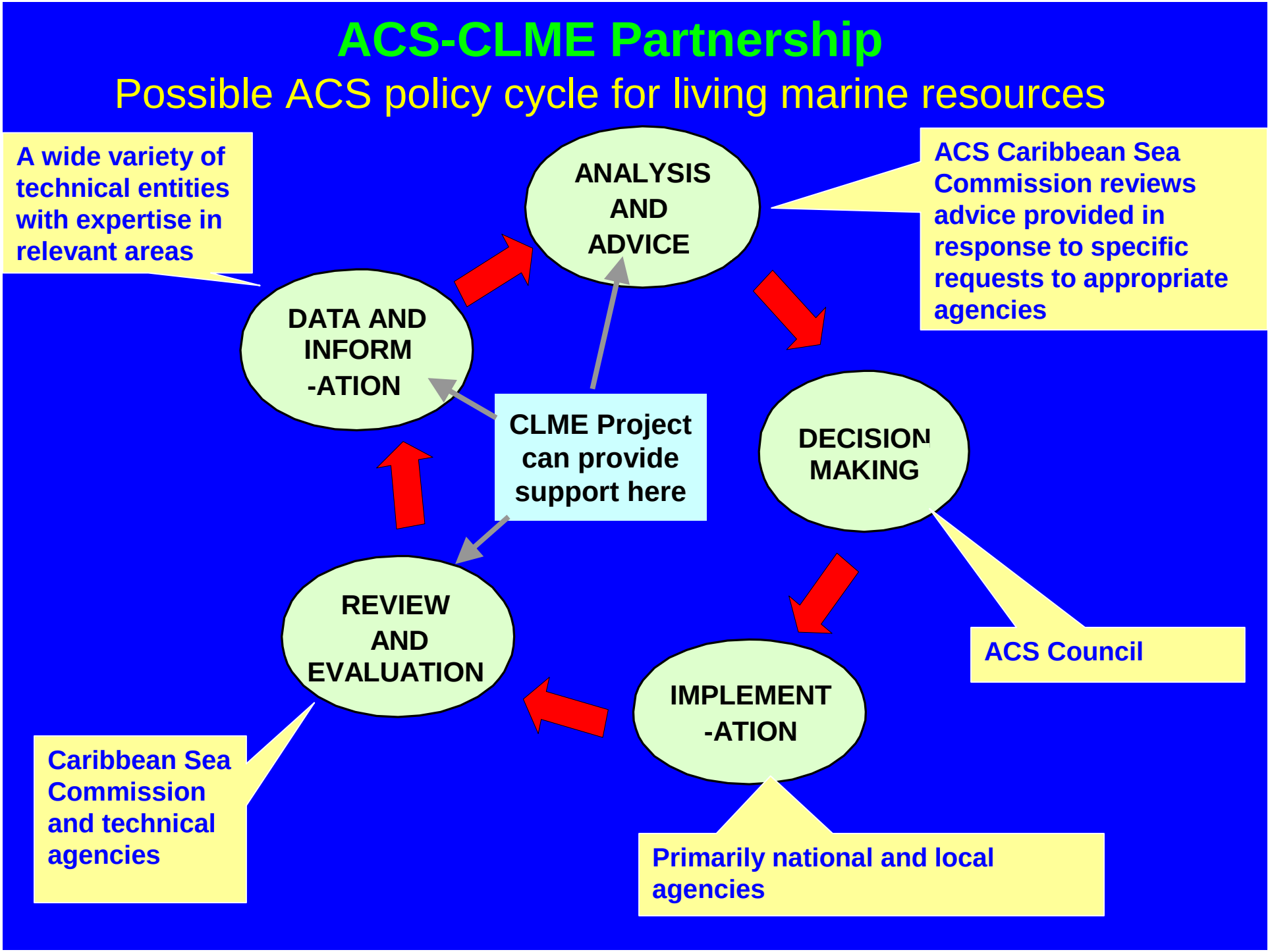
PROPOSED FISHERIES GOVERNANCE FRAMEWORK
CARIBBEAN LARGE MARINE ECOSYSTEM PROJECT (CLME)



Source: Robin Mahon

ACS-CLME Partnership

Possible ACS policy cycle for living marine resources



Communication

The End