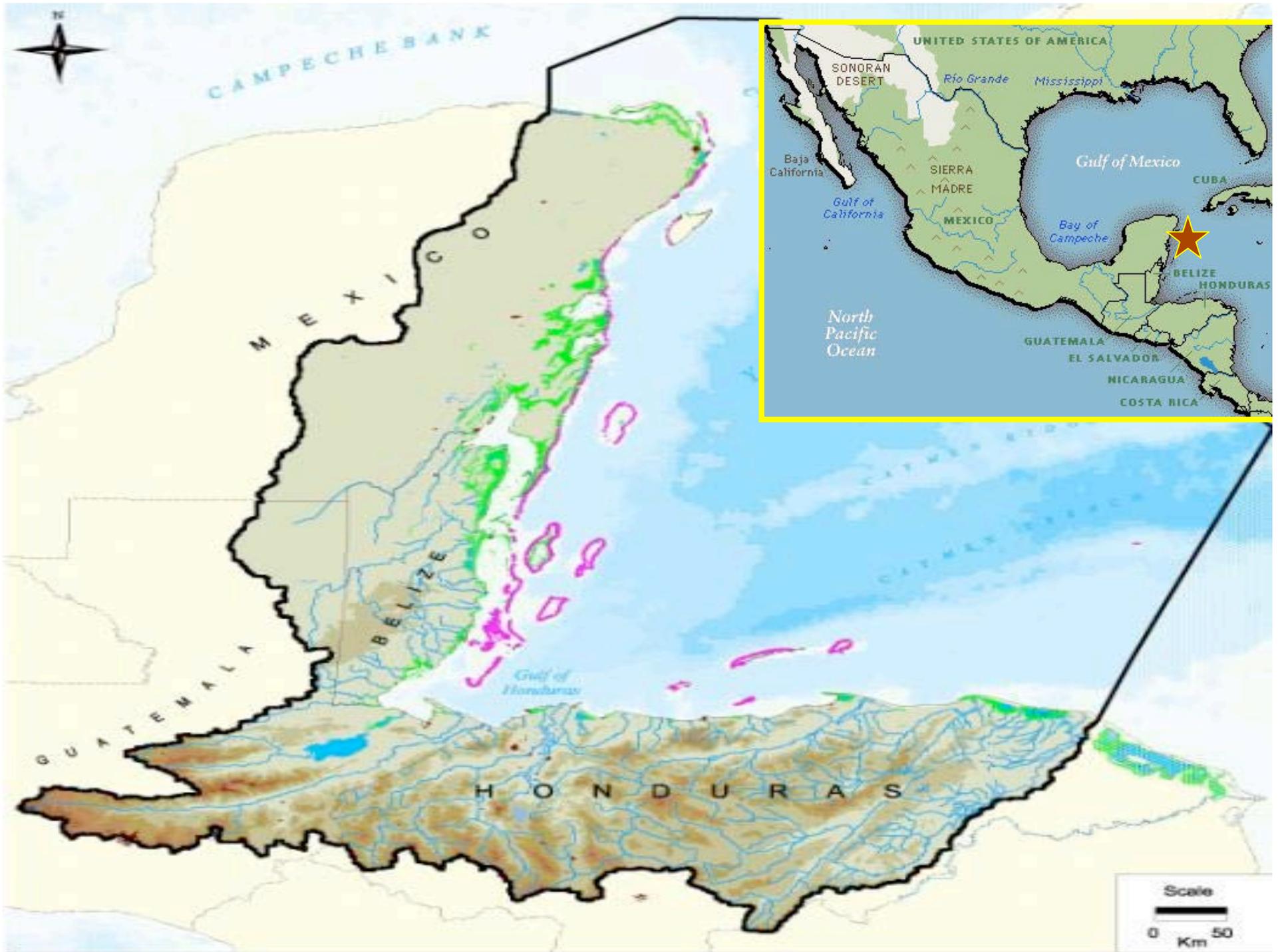


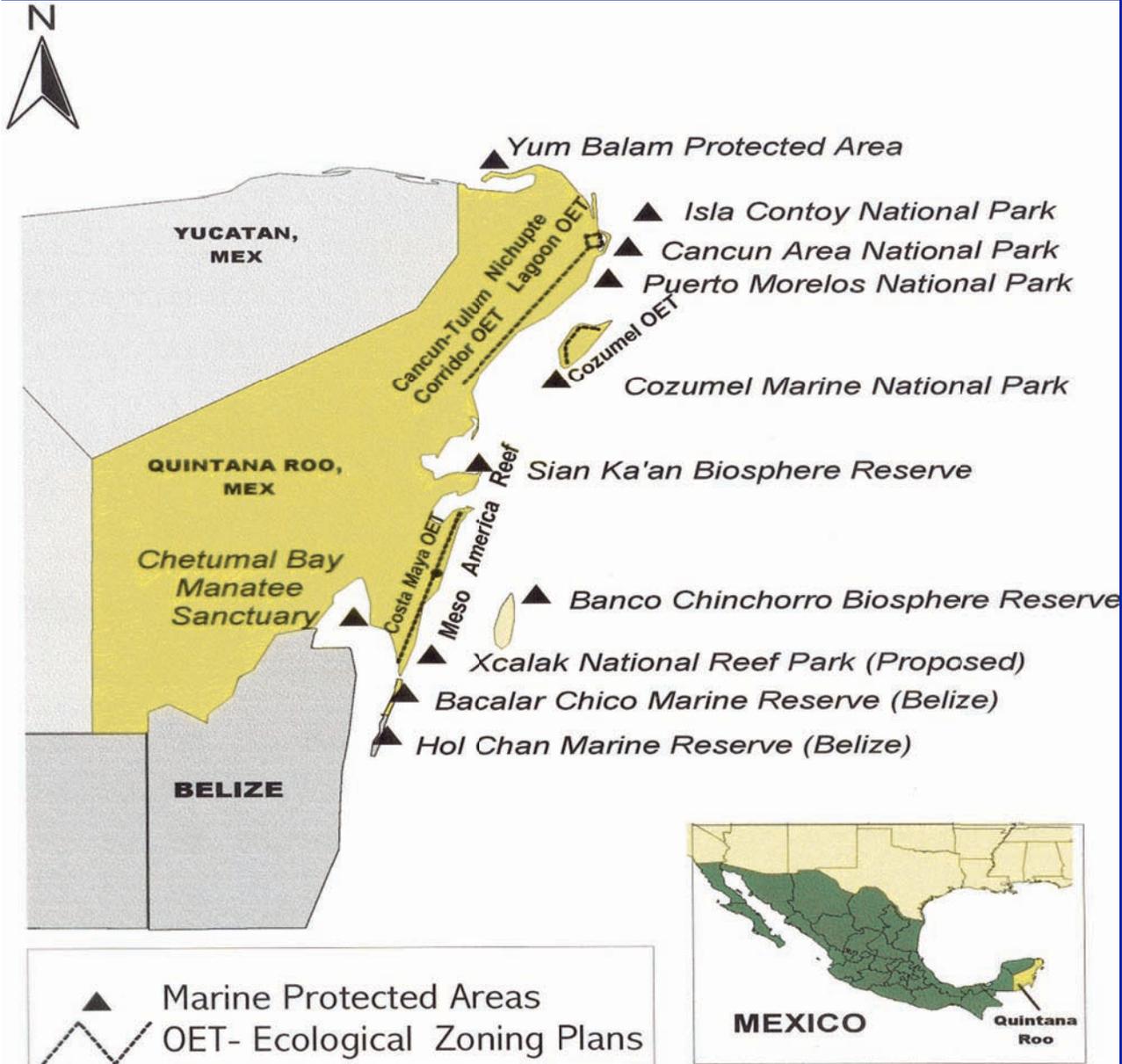


Marine Protected Areas, Local Communities and Tourism: The Challenges





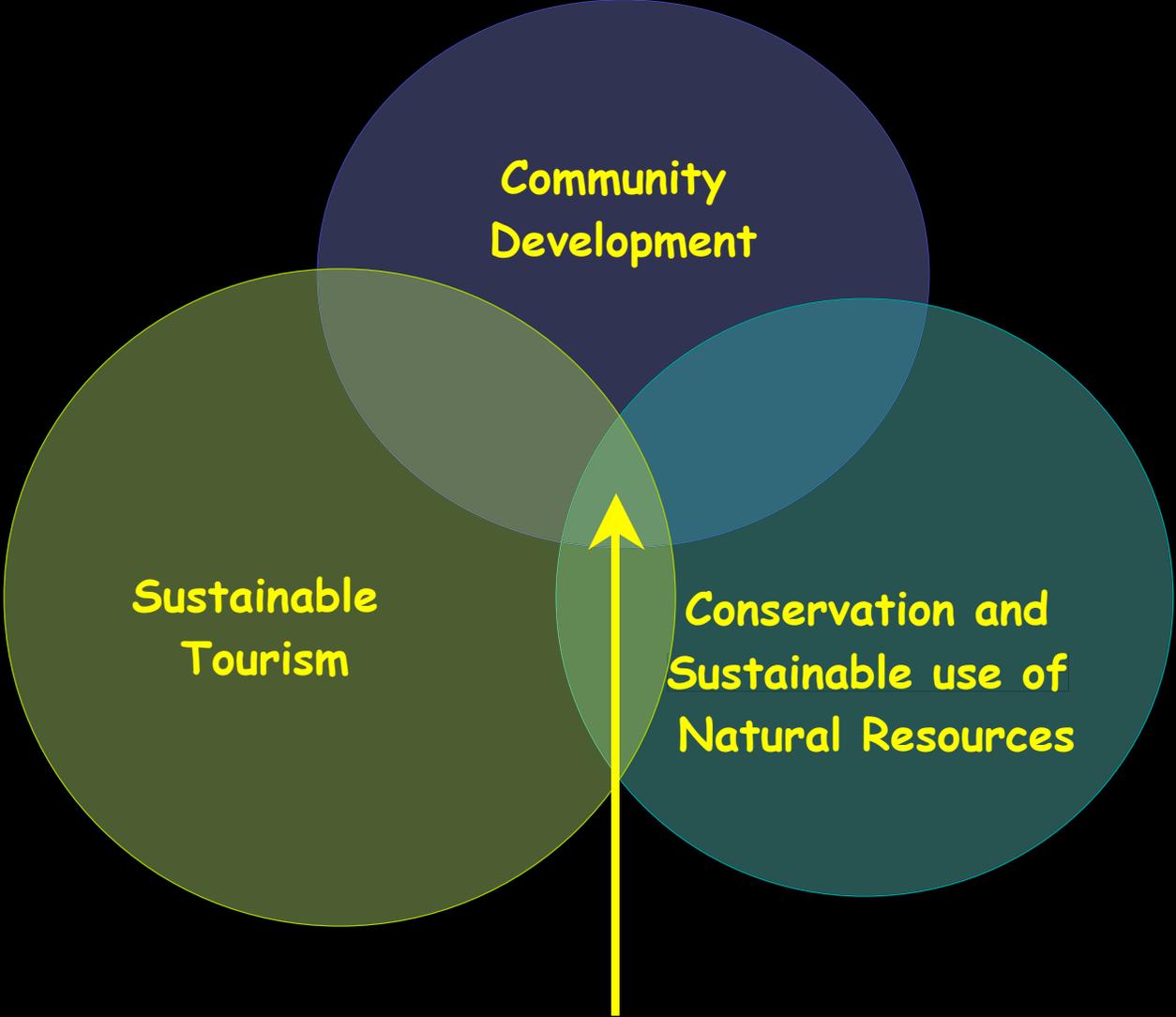
MPAs and ICMM



- Ecological Land Zoning Ordinance
- Protected Areas
- Guidance
- Meso-American Reef Initiatives
- Community-based Management
- Stakeholder

Tourism and MPAS as Tools for Integrated Coastal and Marine Management

- Primary pressure and “use” in QR
- Opportunity to involve broad group of stakeholders
- Builds community leadership and equity
- Integrating tool of regulatory, planning and economic incentives



**Community
Development**

**Sustainable
Tourism**

**Conservation and
Sustainable use of
Natural Resources**

Benefits of Successful MPAs

Biological

- Protect Spawning grounds
- Protect Genetic diversity
- Provide Sanctuary for Endangered & Migratory Species
- Maintain Areas for Science & Education

Benefits of Successful MPAs

Economic

- Improved Fishery Yields
- Tourism Revenues
- Recreation Values
- Reduce flooding and erosion

Benefits of Successful MPAs

Management

- Provides a Sense of Place Fostering Stewardship
- Promotes Legal Jurisdiction Empowering the Local Community
- Provides Management Examples to Copy
- Field Test for Vague Concepts and Premises
- Implementation of the Precautionary Principle

Benefits of Successful MPAs

Other

- Spiritual, cultural, and aesthetic values
- Future values

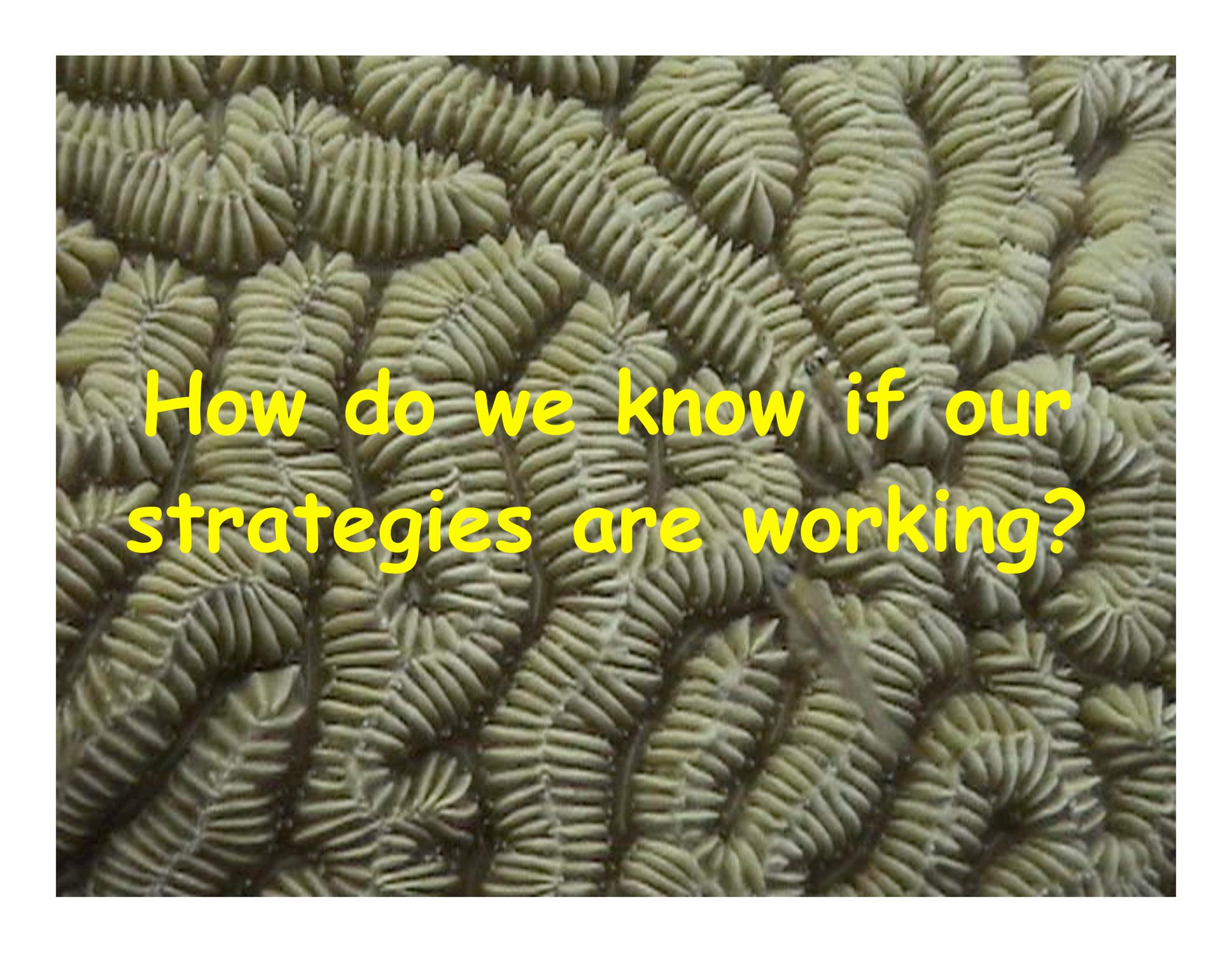
MPAS as Tools for Testing Premises

- It is possible to reduce level of resource use of Local Communities (i.e. fishing effort, landings, reef, sea grass, mangrove, damage)
 - **Diversifying Sources of Income**
 - Fishers as Sustainable Tourism operators
 - Independent and in partnership with private sector
 - Government provides legal framework
 - **Fishers stop fishing several months a year**

Sustainable Tourism Meanings for Different Stakeholders

- **Private Sector:** Economic and marketing context: *how can the tourism market be sustained and grow in the long run?*
- **Local communities:** Social benefits and cultural preservation: *how can tourism help to create economic opportunities for local communities without sacrificing culture and social harmony?*
- **Environmental organizations:** Ecological perspective: *how can tourism help to sustain*

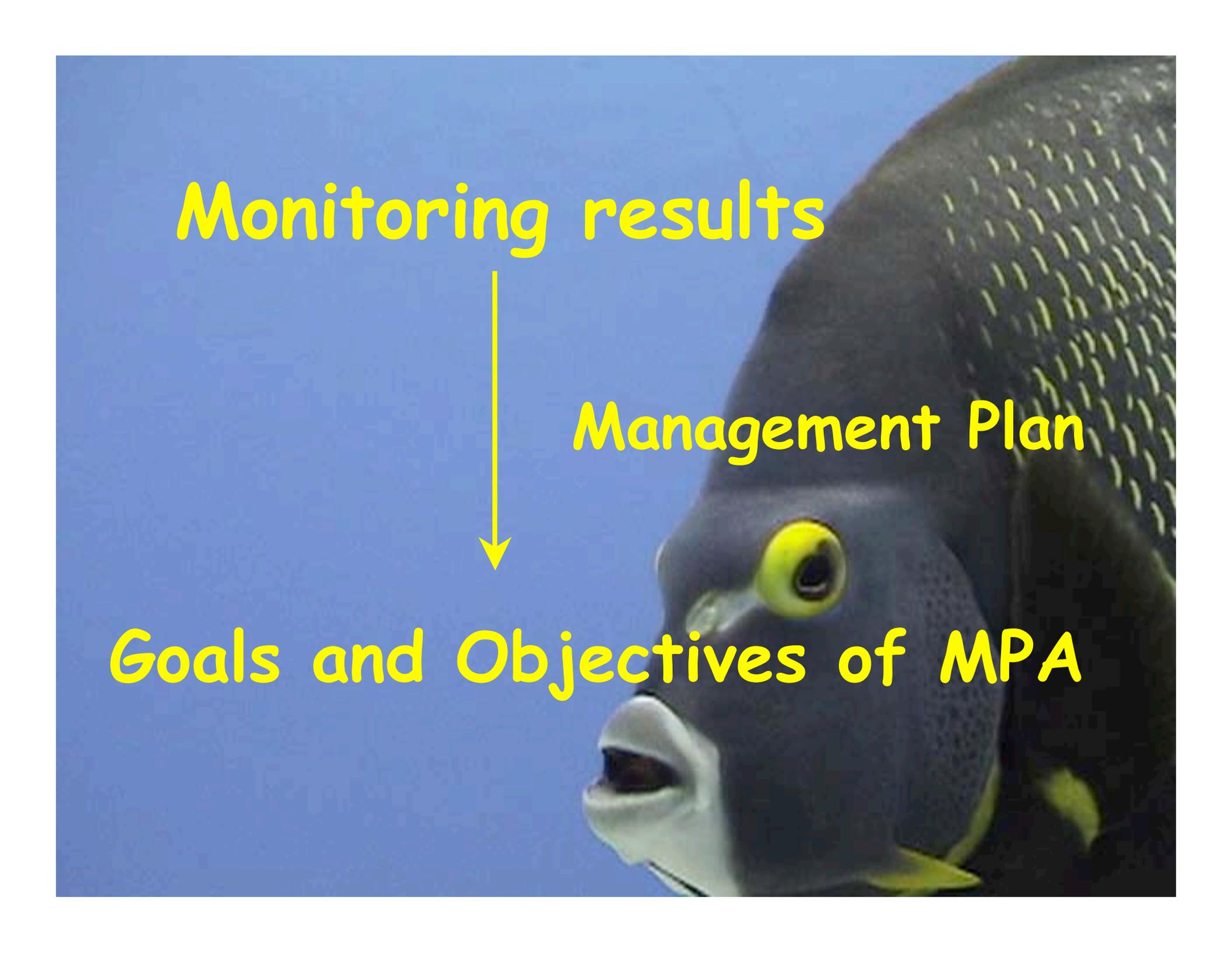


A close-up photograph of a dense field of green ferns, likely a species of fennel fern, showing their characteristic fan-like fronds. The ferns are arranged in a regular, repeating pattern, creating a textured, almost geometric appearance. The color is a vibrant, slightly yellowish-green. Overlaid on this background is the text "How do we know if our strategies are working?" in a bold, yellow, sans-serif font.

How do we know if our strategies are working?

Methodologies

- **Monitoring protocols**
 - **Biological** (coral cover, algal cover, sedimentation, etc)
 - **Socioeconomic** (fishing effort, landings, income, quality of life index, visitation, etc)
 - **Governance** (participatory processes, funding, level of understanding of regulations by the community, etc)

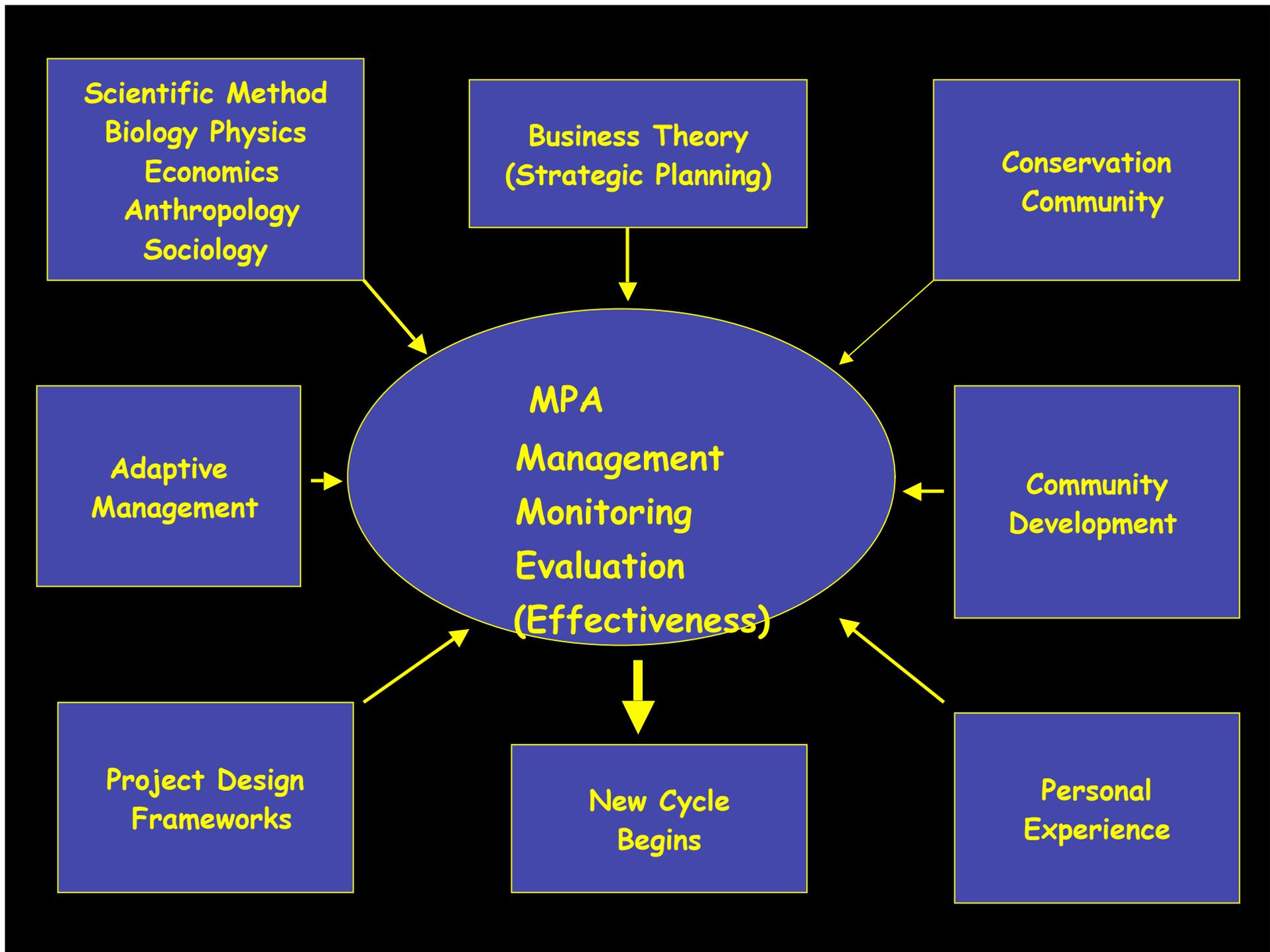


Monitoring results

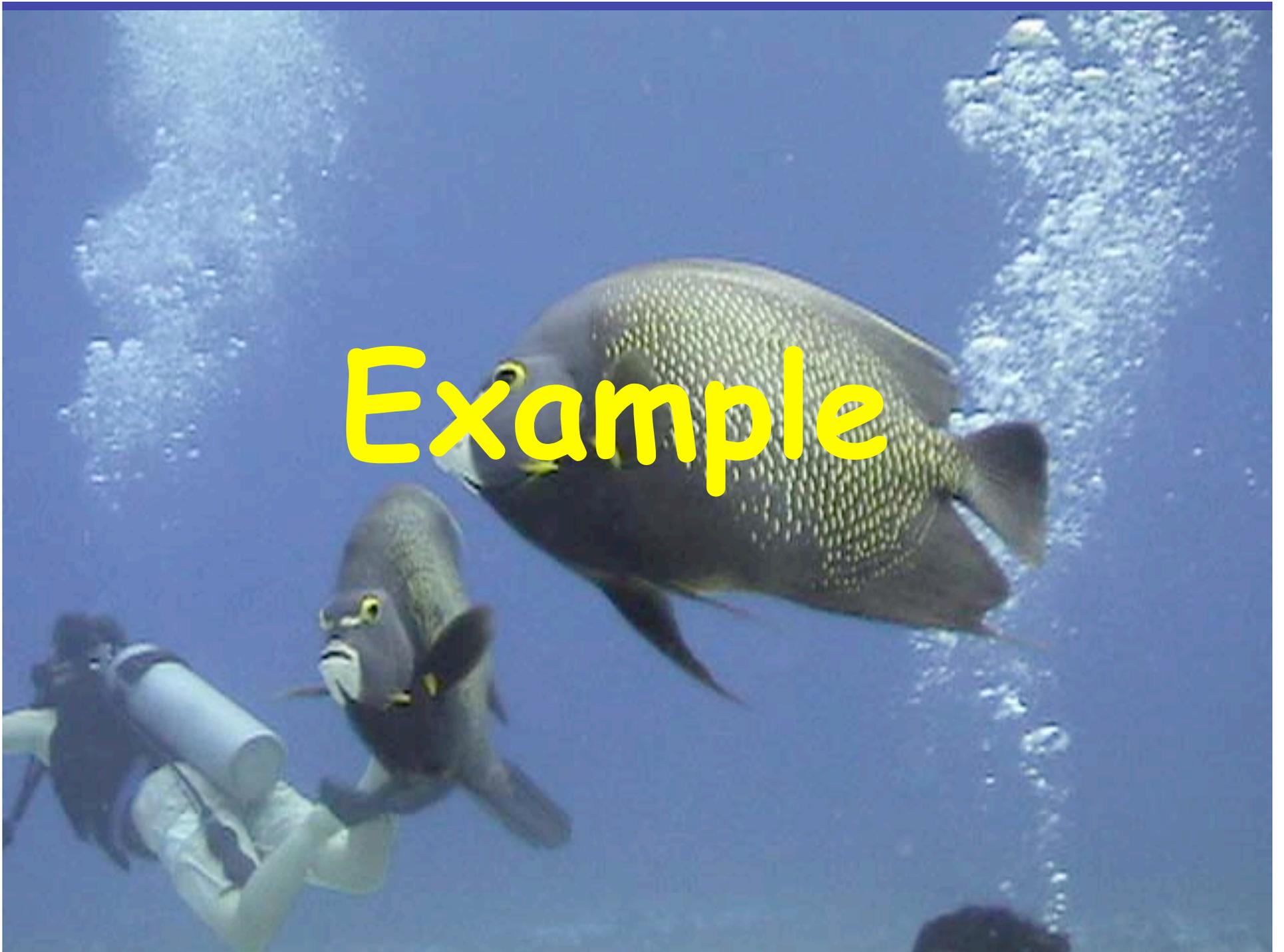


Management Plan

Goals and Objectives of MPA



Example







Visitor Use Management

- Indicators
- Impacts
- Thresholds, Limits
- Management Strategies and Tactics

Tourism Frameworks

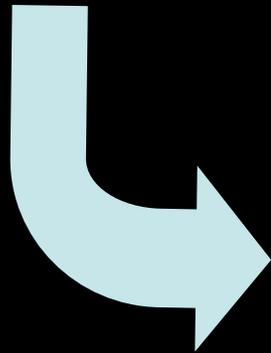
- **Recreation Opportunity Spectrum ROS** (Clark y Stankey) 1978
- **Limits of Acceptable Change LAC** (Stankey y McCool, 1972; Stankey et. al., 1985, McCool y Stankey, 1992)
- **Visitor Impact Management VIM** (Graefe et. al., 1990; Loomis y Graefe, 1992)
- **Visitor Experience and Resource Protection VERP** (Hof et. al., 1993; NPS, 1995)
- **Tourism Optimisation Management Model**

**Ecologically
Oriented**

CC LAC

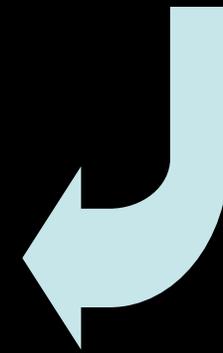
Visitor Oriented

ROS



Integrated Systems

VERP TOMM



Managers in QR want

Numbers, in order to deal with legal battles regarding use permits i.e. boats, divers, wave runners.

How many, divers, boats (upper limits); to sustain "healthy" habitats, sites, etc

Approaches to Management

Outline:

- Carrying Capacity as a concept in recreation management
- Putting carrying capacity into practice: the VERP model
- Managing recreational use in MPAs

A photograph of a diver underwater with a scuba tank and a large purple fish in the foreground. The diver is in the upper right, and the fish is in the lower center. The background is a clear blue ocean.

Very important!!!!

- **We are managing visitors, people**

- **We are Not managing resources**

Ecological Carrying Capacity

- **Malthus (1798):** Populations growth Density-dependence. Populations, regulated a level -the *carrying capacity*- determined by the abundance of resources.
- **Tourism Planners (1980s):** The population of a given species that can be supported indefinitely in a defined habitat without permanently damaging the ecosystem upon which it is dependent.
 - A metaphor more than a concept -

Carrying Capacity

- Bio-physical Carrying Capacity
 - The amount and type of use an ecosystem can sustain without undue evidence of unnatural impact, e.g. soil erosion, coral damage

Carrying Capacity

- **Socio-psychological Carrying Capacity**
 - The level of human use an area can accommodate before solitude and other experiential values are diminished, e.g. concentration of visitors, noise

Carrying Capacity in a Recreation Context

Definition;

"the amount, kind and distribution of use that can occur without leading to unacceptable impacts on either the physical-biological resource or the available recreation experience"
(Starkey *et al.*, 1990).

Carrying Capacity

- Overuse can affect quality
 - High concentration of visitors, divers; coral sedimentation, change in fish behavior, etc
- Establishments of appropriate levels of use is typically addressed through the concept of carrying capacity
 - Fundamental principle of recreation management
 - Problem: determining Carrying capacity

Carrying Capacity

- Determining Carrying Capacity
 - Simple concept - difficult to implement
 - Dynamic nature of ecosystems makes it difficult to estimate
 - It can be increased/decreased by management/actions human use
 - It is not a fixed value
 - Different for different uses
 - Varies spatially and temporally
 - Product of value judgment as well as scientific evidence

Recreational Carrying Capacity

Three parts:

- *Physical Carrying Capacity (PCC)*
- *Real Carrying Capacity (RCC)*
- *Effective Carrying Capacity (ECC)*

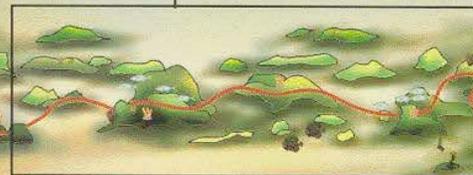
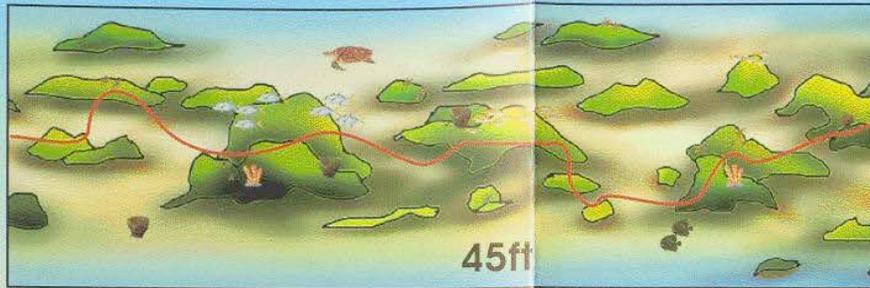
PCC > RCC > ECC

Borrie, McCool y Stankey, 1998
Cifuentes, 1999

Chankanaab Shallow

Chankanaab Park

Playa Corona



30ft



Current



Chankanaab Bolones

55ft

80ft

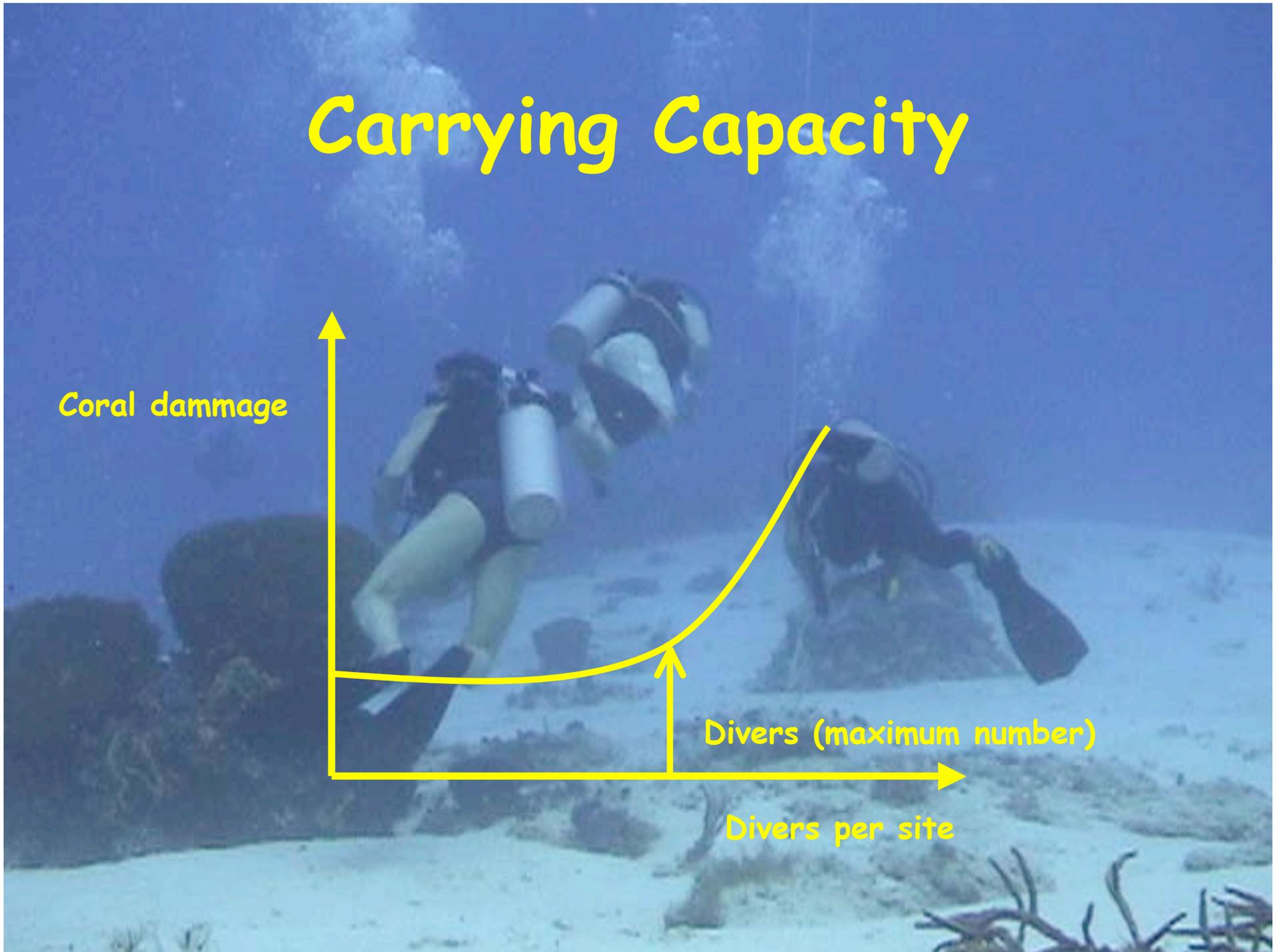
UNDERWATER EDITIONS

Carrying Capacity

Coral damage

Divers (maximum number)

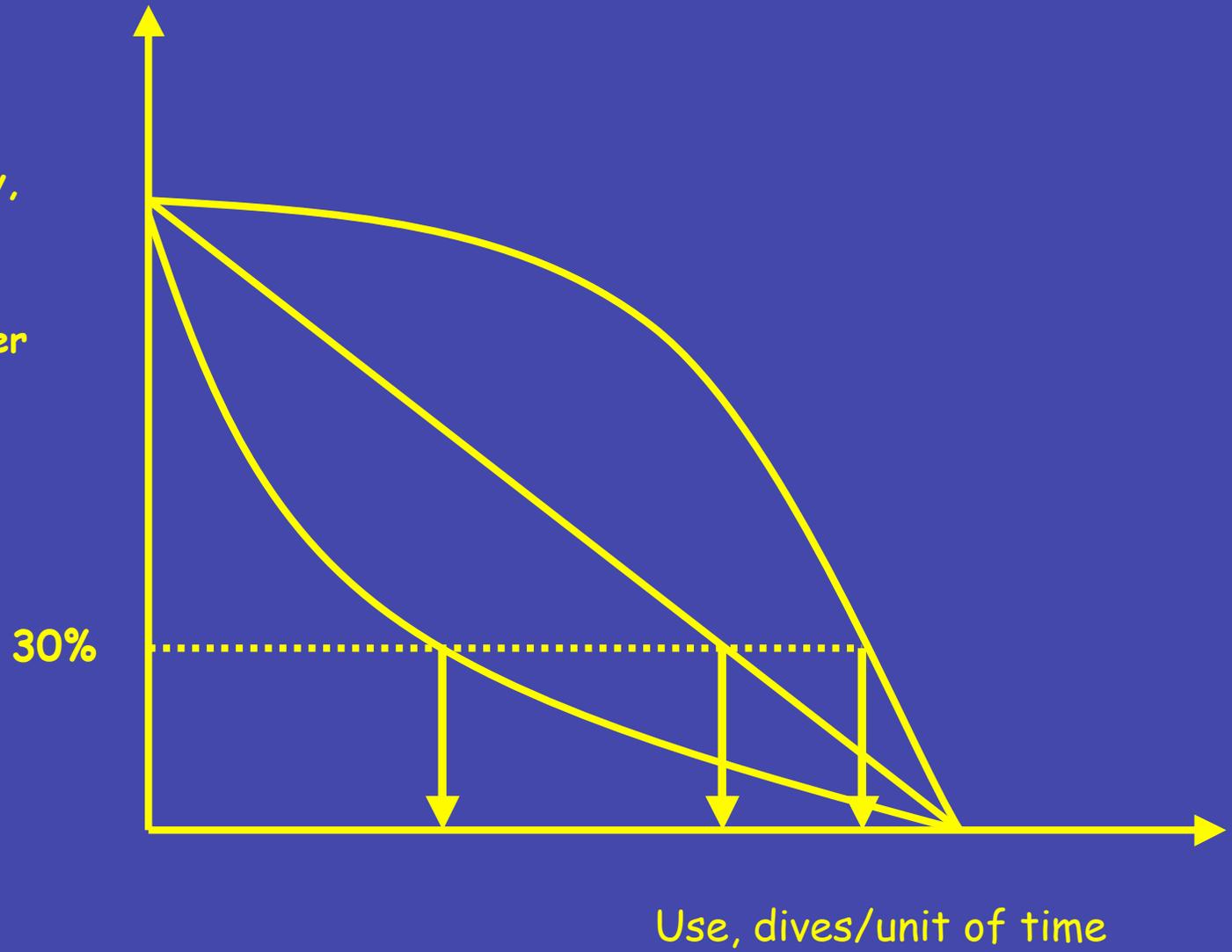
Divers per site



Carrying Capacity

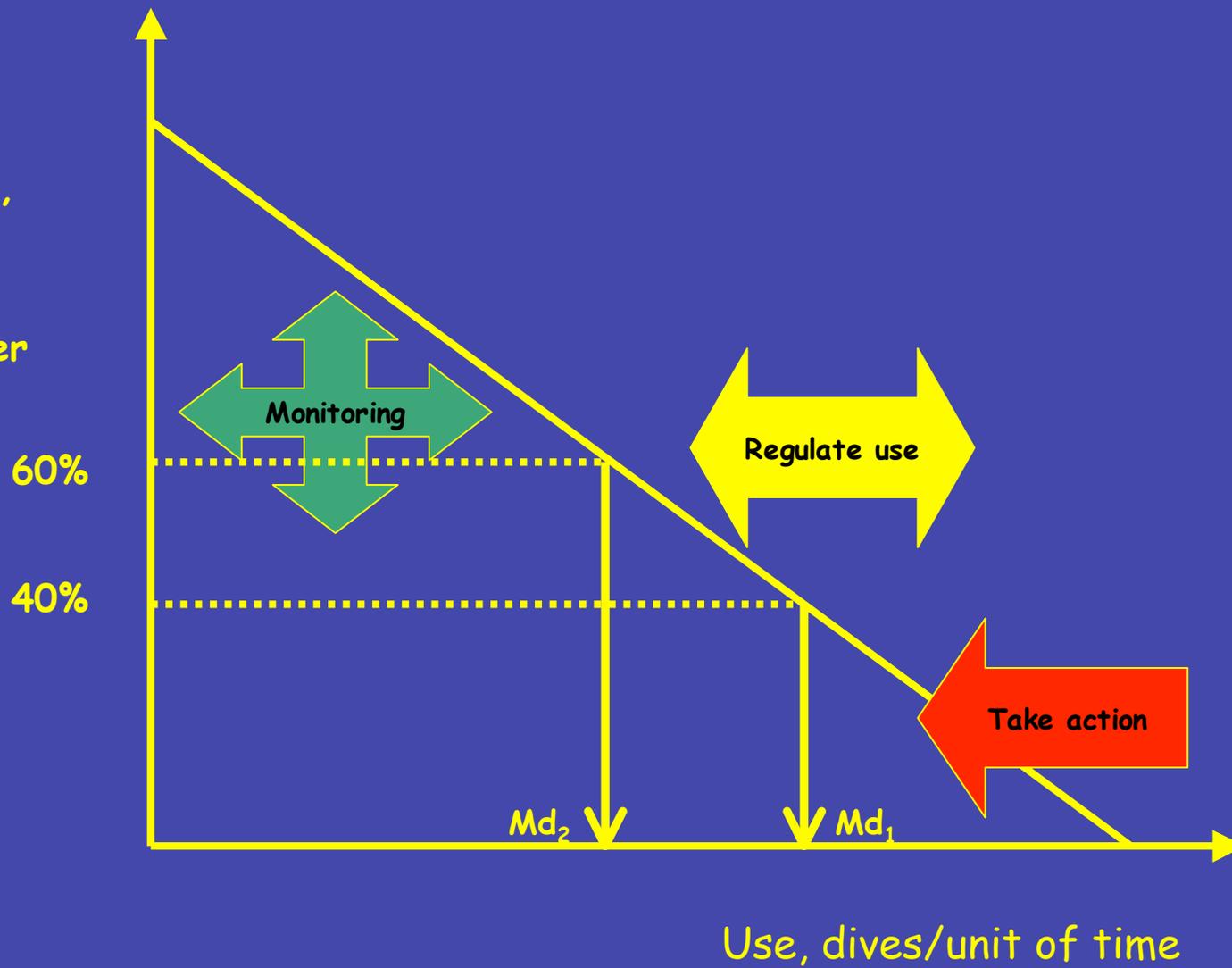
Sp Site Perturbation	Qd Quality of Diving Experience
*Pc Probabilty bottom contact. Coral contacts/Total contacts	Dg Diver per guide Optimum 5 two pairs plus guide 4 groups of 5/Total groups larger than 5
V Vulnerability relative frequency of branching corals (<i>Acropora sp</i> , <i>Porites sp</i> , <i>Agaricia sp</i> , <i>Madracis decactis</i>)	Gs Group size Optimum 10 two groups of 5 2 groups of 10/Total groups larger than 10
	Dg Distance between groups in a site Optimum distance 1000mts. One group per water trail
*Diver experience (B, I, A) probably nested in Pc	Relative frequency of observed optima (limitis thresholds) related to totals

Vulnerability,
Fragility,
% Coral Cover



Vulnerability,
Fragility,

% Coral Cover



Putting Carrying Capacity into Practice: the VERP Model

- VERP requires managers to:
 - Identify where impacts are acceptable
 - Identify the levels of impact that are acceptable (e.g. identify limits to acceptable change)
 - Ensure impacts remain within these bounds

Carrying Capacity

- Management Implementation
 - Biophysical and socio-psychological evidence important only as decision aid
 - Based largely on value judgments
 - Determination of consensus view
 - Recognize that recreation management is really about managing recreation users and their impact
 - VERP

Putting Carrying Capacity into Practice: the VERP Model

- Recognized that change is inevitable
- Provides framework for planning regarding:
 - What changes are acceptable
 - What changes will be permitted to occur

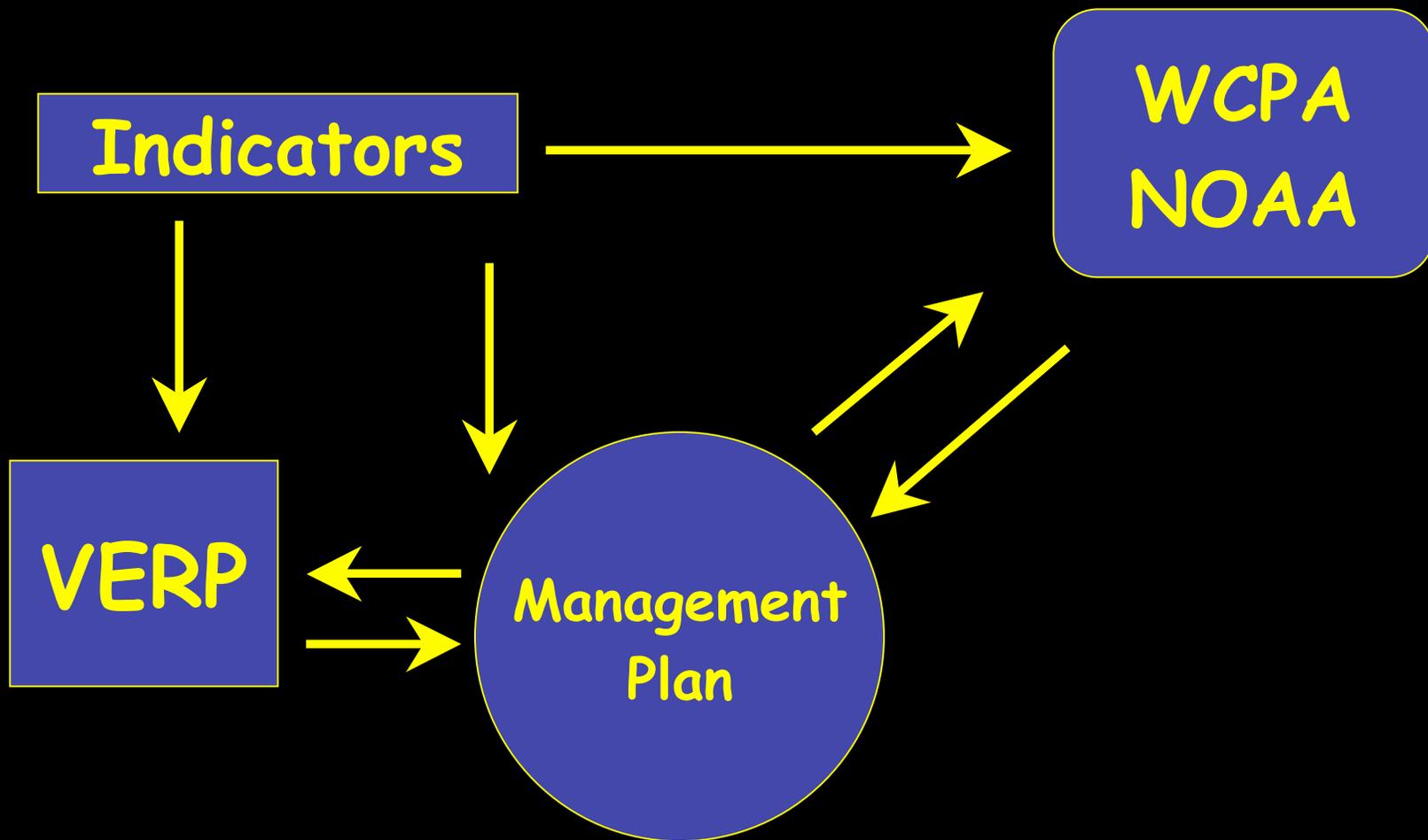
Putting Carrying Capacity into Practice: the VERP Model

9 Steps to VERP process:

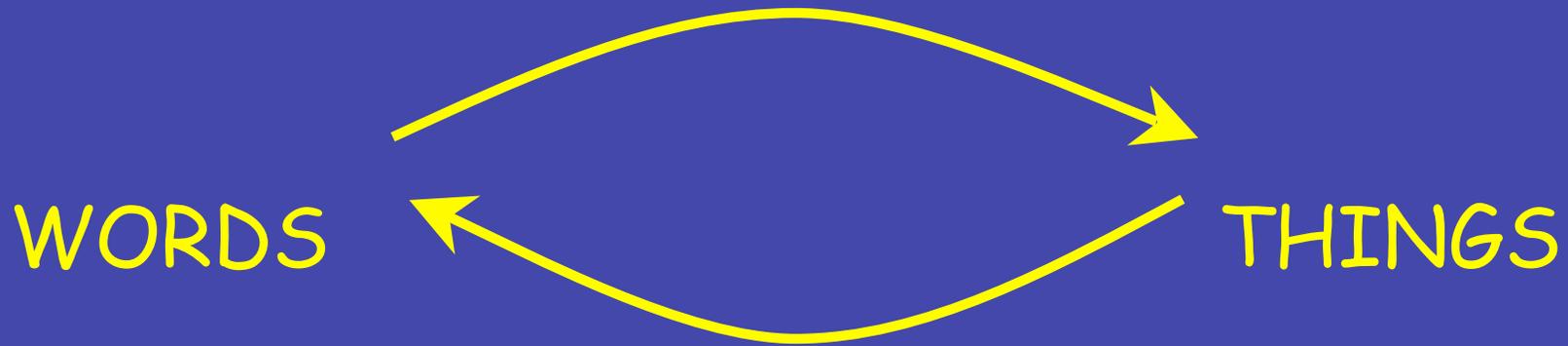
1. Identify area issues and concerns
2. Define and describe opportunity class
3. Select indicators of resource and social conditions
4. Inventory of existing resource and social conditions
5. Specify standards for resource and social indicators for each opportunity class
6. Identify alternative opportunity class allocations reflecting area issues and concerns and existing resource and social conditions
7. Identify management actions for each alternative
8. Evaluate and select preferred alternative

Putting Carrying Capacity into Practice: the VERP Model

- VERP consists of 4 major components:
 - Specification of acceptable and viable conditions
 - Analysis of existing conditions and acceptable change
 - Identification of management actions to achieve desired conditions
 - A program or a monitoring protocol to evaluate effectiveness WCPA-NOAA



CODA



Comprehensive methodology
and

And principles

Particular, singular

unique context

THANKS

