



- Poor and/or tenuous linkages between managers, scientists & stakeholder communities.
- Scarcity of truly management-oriented science.
- Political goals & poorly informed public pressure driving priorities of science support & resource management policy.
- Management-oriented science impeded by nonscience variables.



### Contrasting perspectives between Scientists and Policymakers

**Ends and Means** 

**Scientists** 

Policy makers

Goal, purpose:

seek truth

represent constituents

Basic orientation:

understand, explain

act, decide

Mechanisms:

unbiased methods-impersonal

opposing interests-highly personal

**Attention Spans** 

**Scientists** 

**Policy makers** 

For system:

long, incremental

short - must act now

For individual:

next grant, tenure

next election

Attention span:

long

low

short due to situational press

Accountability

**Scientists** 

Policy makers constituency

Responsible to:

standards, peer

high

Rewarded for:

Real-world:

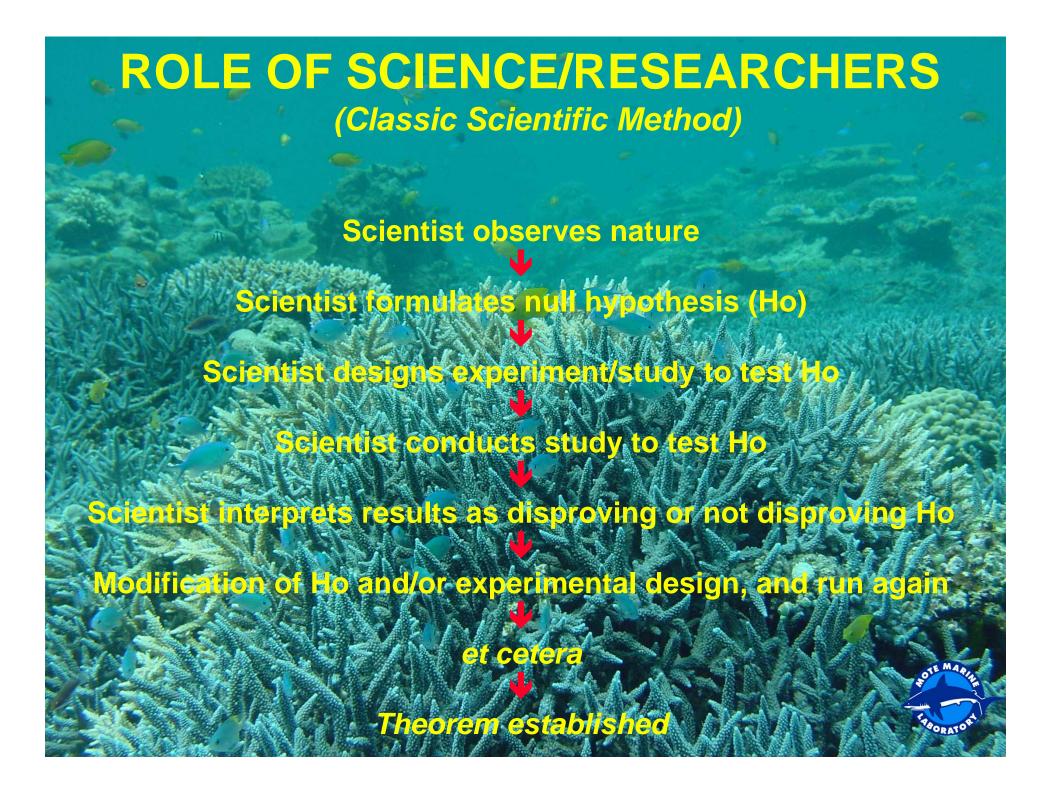
experimenting

being right

Mode of action:

autonomy

being "team player"

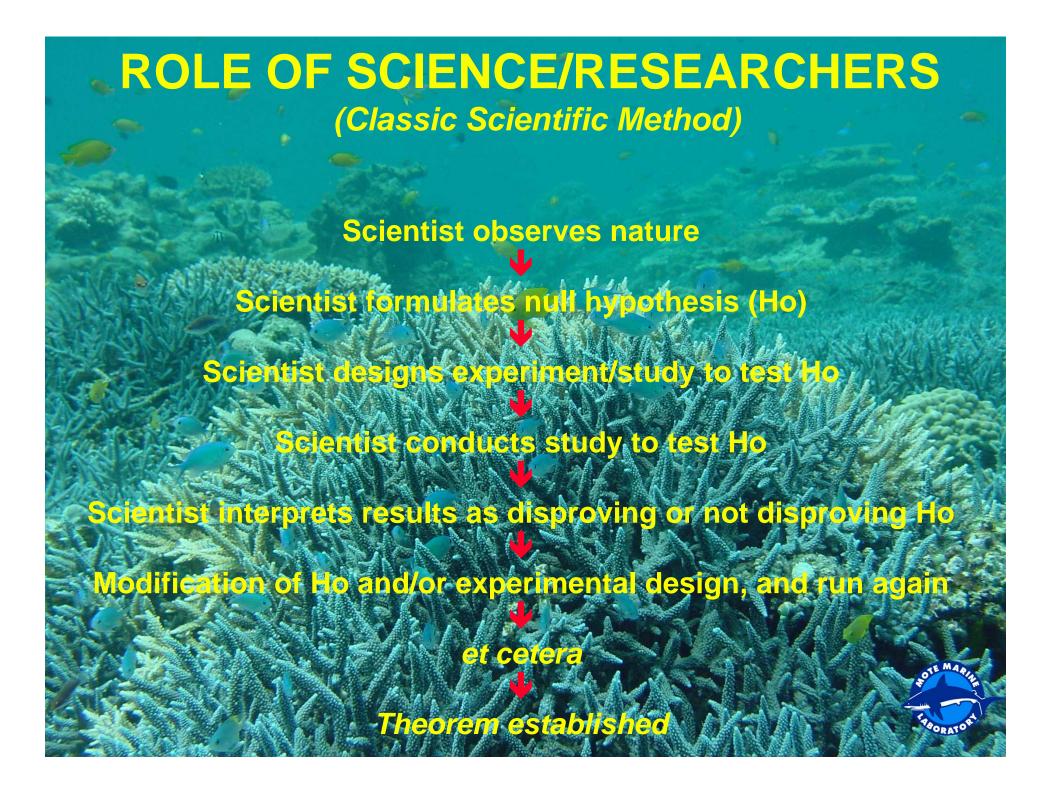


#### **Management-Oriented Research Should:**

- Address needs of managers by focusing on the ecological & socio-economic impacts of management strategies.
- Yield information to build more cohesive partnerships between Managers/Scientists/Special Interests/Public for development, implementation & operation of marine resource sustainable use strategies.
- Focus on critical management strategies that influence ecological, economic & sociological sustainability.
- Foster analyses & recommendations for dealing with current & emerging issues on resource sustainability.
- Illustrate how sociological, cultural & economic factors (i.e., the human dimension) are included.

## Improved Translation & Transfer of Information Among & Between Scientists, Managers & the Public

- Agencies & other funding institutions must commit long-term support for translation & transfer of S&T information in formats that are understood by different user groups.
- New generation of professionals must be trained & employed as "translators" to bridge gap in cultural "personalities" of different communities (i.e., scientists, managers, public).



#### INTEGRATED SCIENCE, MANAGEMENT, & EDUCATION/OUTREACH

[New Paradigm]

Managers, Scientists & Public realize existence of a problem

Managers receive understandable information

New Policies

Public Pressure

Need facts to base policy upon; Managers and Scientists develop research agenda and call for proposals

Scientist observes

nature and RFP

Change in public perception & action

**Education & Outreach** 

**Translators** (Blend of science, policy & education)

Scientist formulates null hypothesis (Ho) Scientist designs study to test Ho

to Agency

Scientist interprets results as disproving or not disproving Ho

Results forwarded to Agency

Scientist conducts study to test Ho

Proposal submitted Proposal funded



#### Flow Diagram for Ecological Risk Management A Guideline for Ecological Risk Management Procedures (Rossberg et al., 2005; Landscape Ecol Eng) Scientific procedure Consensus building 0. Concerns, issues scientists 1. Screening 2.Delimit management scope, invite stakeholder 3.Organize local council and scientific committee 4. Characterize "undesired events" 5. Enumerate measures of effects 6. Analyze stress factors by modelling not agreed 7. Risk assessment for no-action case 8. Check necessity and purpose of management Reset goals when infeasible 9. Set preliminary numerical goal 10. Choose monitoring measures 11. Select method of control 12. Check feasibility of goals 13. Decide measures & goals 14. Initiate management 15. Continue management and monitoring 16. Review numerical Revision required goals and purposes Finish program

#### 科学者とステークホルダーのコミュニティ「地域環境学ネットワーク」 の構造

Structure of the Local Science Network for Environment and Sustainability

#### 協働のガイドライン

Guideline of collaboration

科学研究に取り組む ステークホルダー Knowledge producers a,omg stakeholders 参加型研究評価システム
Participatory evaluation of local science

多様な地域社会の ステークホルダー Diverse stakeholders of the local communities MMAN F7ーク
Local Science Network

個別課題の ネットワーク Network for specific environmental problem

レジデント型研究機関 Residential research institutions 地域ごとの課題解決 ネットワーク Local networks tackling environmental issues

多様な事例についての情報共有 学びあい、育てあうネットワーク

Sharing information among diverse examples Network for collaborative mutual learning

#### **Coordinating System in Shiretoko WNH Site**

Expanding fisheries co-management to ecosystem-based management: A case in the Shiretoko World Natural Heritage area, Japan (Makino et al., 2009; Marine Policy)

Shiretoko World Natural Heritage Site Regional Liaison Committee

Role: exchange information, and coordinate interests/policies amongst administrative sectors.

Participants: Central/local government, Fisheries Cooperative Associations, Sightseeing Guide Associations, and NGOs.

coordination

cooperation

Shiretoko World Natural Heritage Site Scientific Council

Role: Provide Scientific Advices on management, research, and monitoring activities

Participants: Scientists, Central/local government, Fisheries Cooperative Associations, and NGOs.

Shiretoko National Park Committee for the Review of Proper Use

Role: Build use rules for tourists to reduce negative impacts on environment

Participants: Scientists, Central/local government, NGOs.

Marine WG

River Construction WG

YezoDeer WG





#### Leading the Way in Global Marine Science and Education



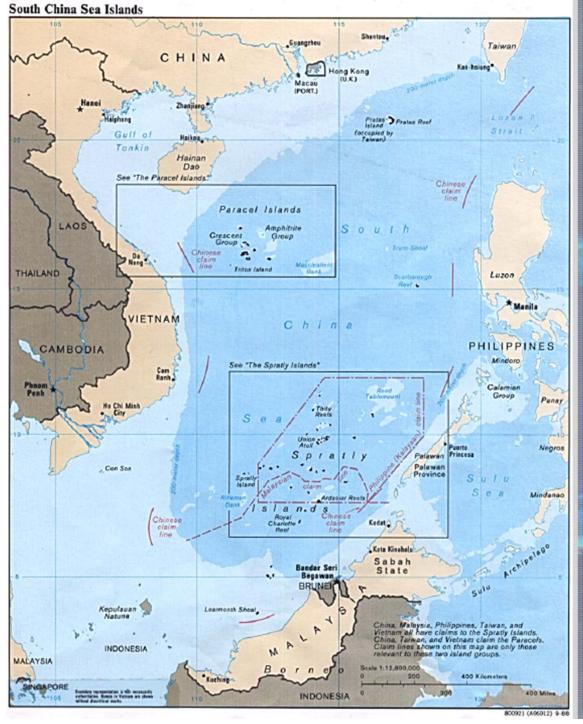


### The Red Sea Marine Peace Park Cooperative Research, Monitoring and Management (RSMPP) Program:

Lessons Learned from the Integration of Marine Science and Resource Management

The Red Sea Marine Peace Park International Symposium Aqaba, JORDAN December 2-4, 2003

- •RSMPP implemented a pioneering effort to employ & test this new paradigm.
- •Jordan & Israel resource management & marine science institutions have partnered together to initiate this trans-boundary Cooperative Research, Monitoring & Management Program."
- •Overall goal was to foster cooperation & partnership among Jordan & Israel stakeholder groups in studying, managing, promoting awareness of, & protecting their shared marine resources



The 4th Conference on the Protected Areas of East Asia IUCN/WCPA-EA-4 March 2002 - Taiwan Marine Session Recommendation for East Asia

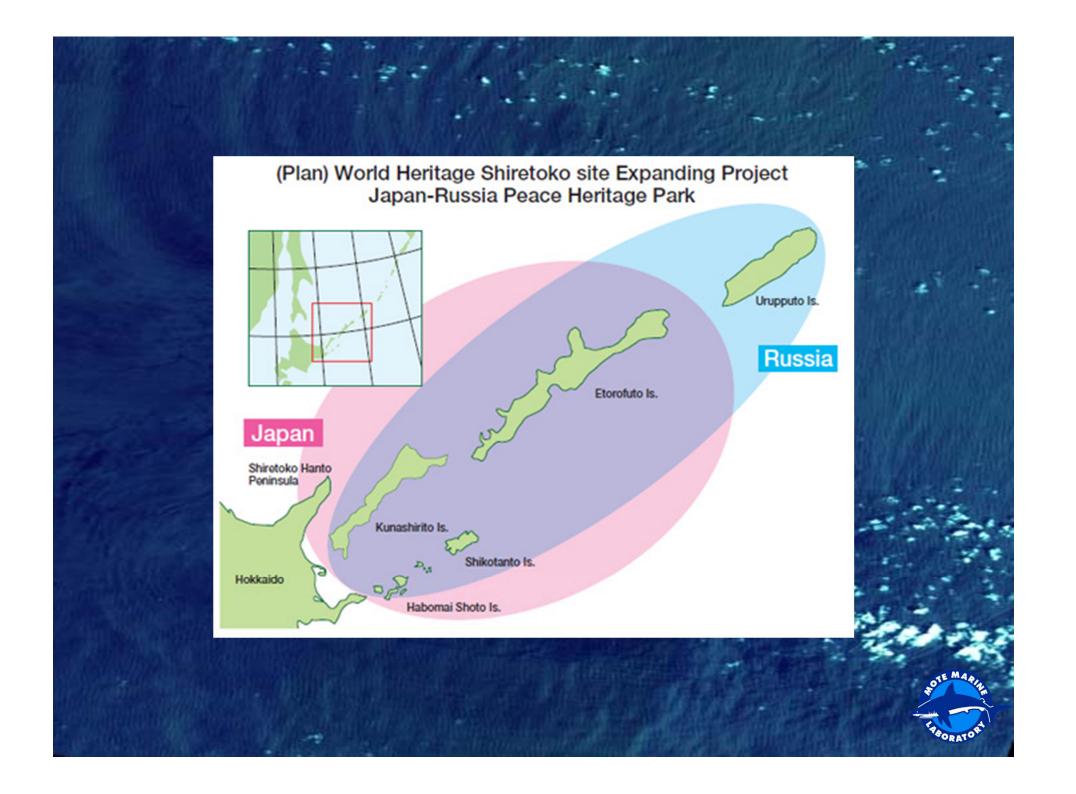
"Following the example of the Red Sea Marine Peace Park Research, Monitoring and Management Program, recommend that APEC consider designing and implementing an international cooperative research and monitoring program to focus on the Spratly Islands marine environment with the goal of establishing marine protected areas."

# The 10<sup>th</sup> Pacific Congress on Marine Science and Technology PACON 2002, July 2002 - Japan Special Forum on Spratly Islands Environmental Issues Co-Convenors: Dr. T.E. Chua and Dr. M.P. Crosby Panelists: Dr. R. Guerrero, Dr. H.S. Hou, Dr. B.H. Long, Prof. Y. Wang, Dr. Q. Zhang



#### **Consensus Recommendation**

PACON should Establish a
Scientific Committee to
Promote Collaboration and
Cooperation between
Scientists through Scientific
Fora, with a Focus on the
Protection of the Spratly
Islands Marine
Environment.



### Candidates for Cooperative Trans-Boundary Marine Protected Area Research, Monitoring and Management Programs

- Eastern Caribbean Island States
- Gaza/Jordan-Israel on Mediterranean
- Pakistan-India
- Former Republics of Yugoslavia in Adriatic
- Greece-Turkey on Cyprus
- Pratas Island & Spratly Islands
- Japan-Russia Marine Heritage Park



# Key to New Paradigm: Integration of Science & Management with link to the Public

- Research & Monitoring teams deliver relevant data to management team.
   Management teams integrate the data &
- analyses into decision-making process.

   Management teams, R&M teams and local Communities jointly discuss trends
- & issues leading to increased communication & coordination that achieve shared goals.

### VISION FOR THE FUTURE OF ECO-RISK MANAGEMENT

- Paradigm for managing marine resources must shift from a fragmented to an integrated approach, from a site-specific to an ecosystem-wide context, and from a reactive to a pro-active mode.
- Identification and understanding of the economic and social driving forces behind non-sustainable use of natural resources
- Improved stakeholder communication and partnership.
- User friendly information and validated analytical models.
- Stronger public education program.