



Integrating Science, Policy & Local Communities: *A 21st Century Paradigm for Marine Eco-Risk Management*

***Global Center of Excellence (G-COE) Forum
Yokohama National University
August 2010***

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Challenges with Interaction Between Managers, Scientists, & the Public

- *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 non-science variables.*



Contrasting perspectives between Scientists and Policymakers

Ends and Means

Goal, purpose:

Scientists

seek truth

Policy makers

represent constituents

Basic orientation:

understand, explain

act, decide

Mechanisms:

unbiased methods-impersonal

opposing interests-highly personal

Attention Spans

Scientists

For system:

long, incremental

Policy makers

short - must act now

For individual:

next grant, tenure

next election

Attention span:

long

short due to situational press

Accountability

Scientists

Responsible to:

standards, peer

Policy makers

constituency

Real-world:

low

high

Rewarded for:

experimenting

being right

Mode of action:

autonomy

being “team player”



ROLE OF SCIENCE/RESEARCHERS

(Classic Scientific Method)

Scientist observes nature



Scientist formulates null hypothesis (H_0)



Scientist designs experiment/study to test H_0



Scientist conducts study to test H_0



Scientist interprets results as disproving or not disproving H_0



Modification of H_0 and/or experimental design, and run again



et cetera



Theorem established



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).*



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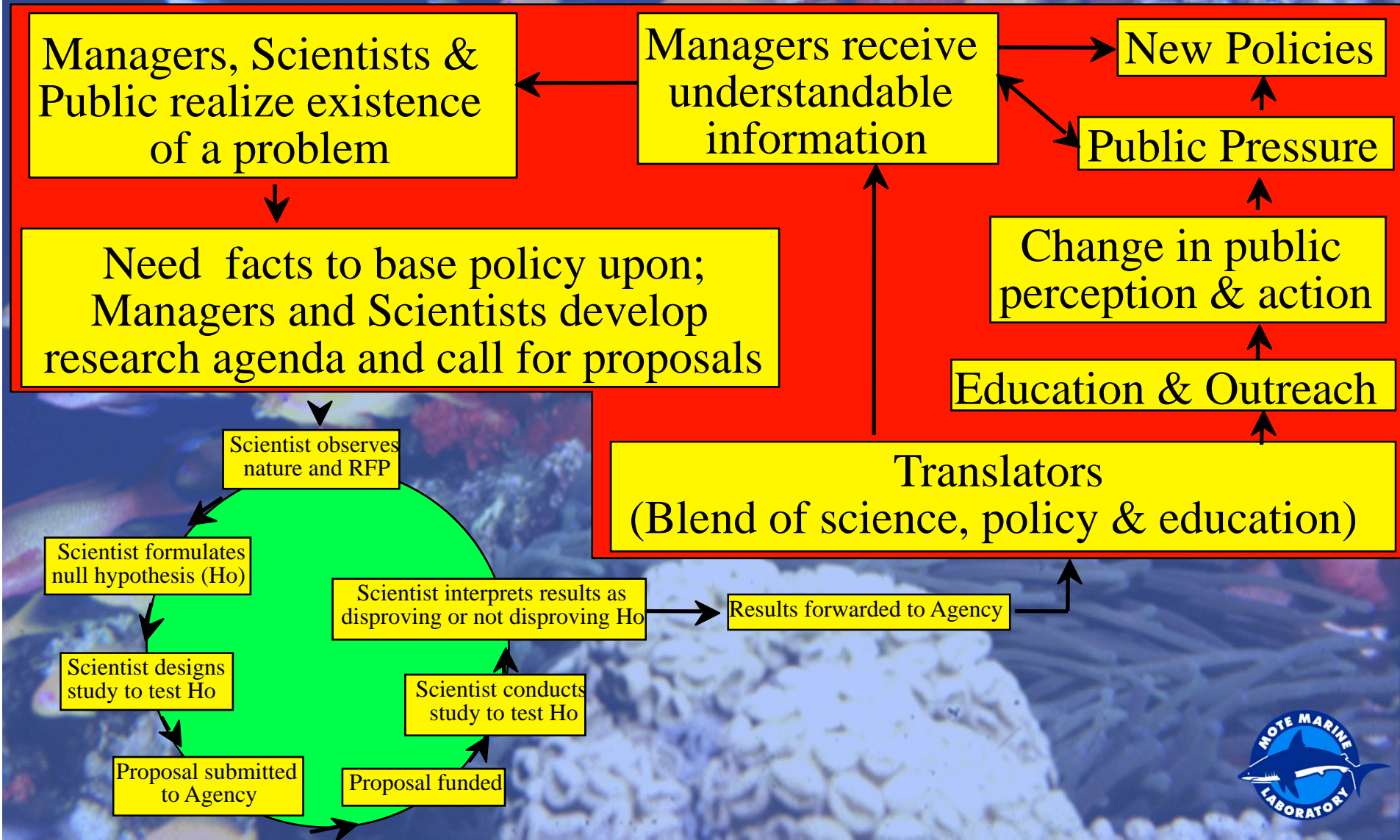


Theorem established



INTEGRATED SCIENCE, MANAGEMENT, & EDUCATION/OUTREACH

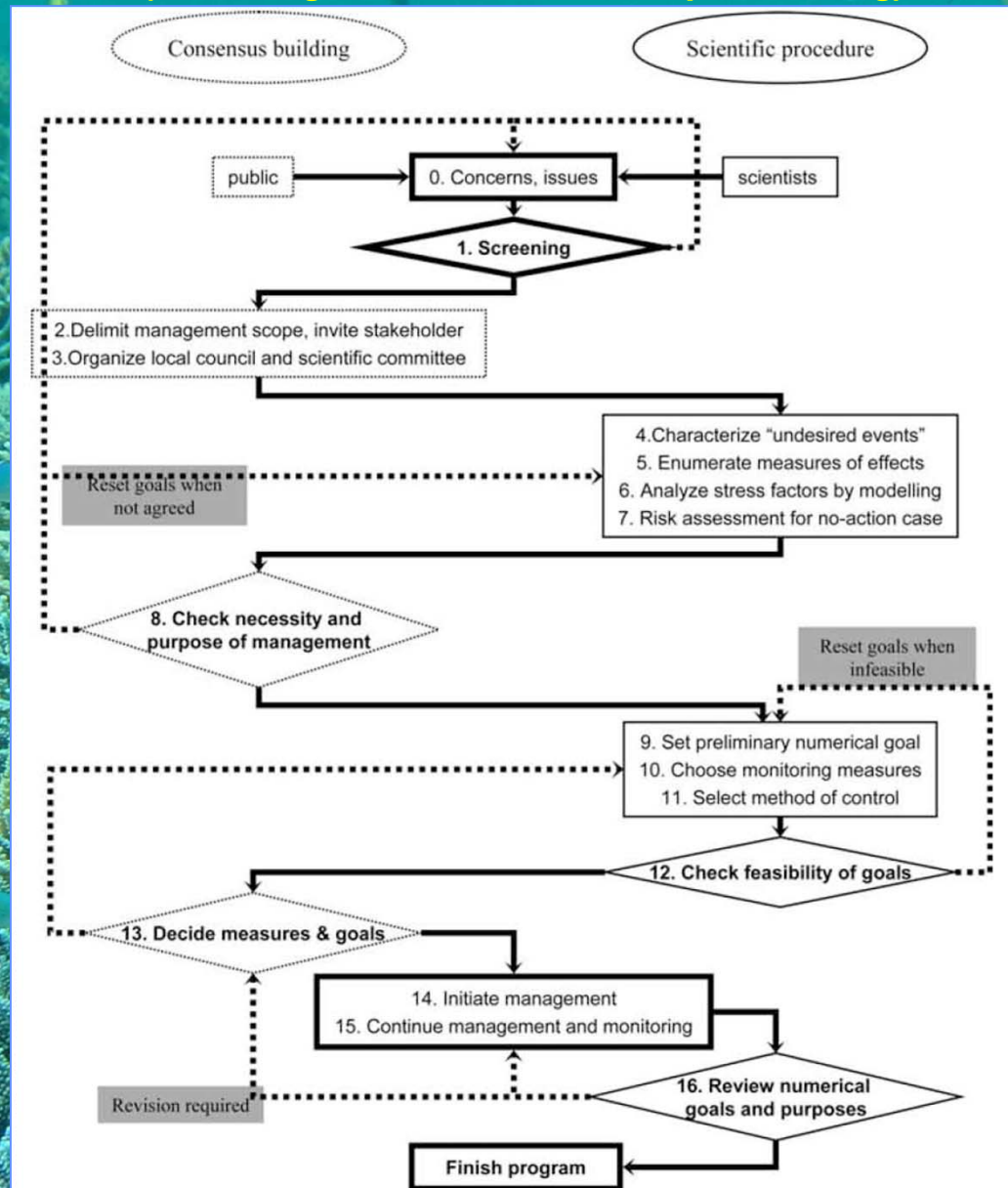
[New Paradigm]



Flow Diagram for Ecological Risk Management

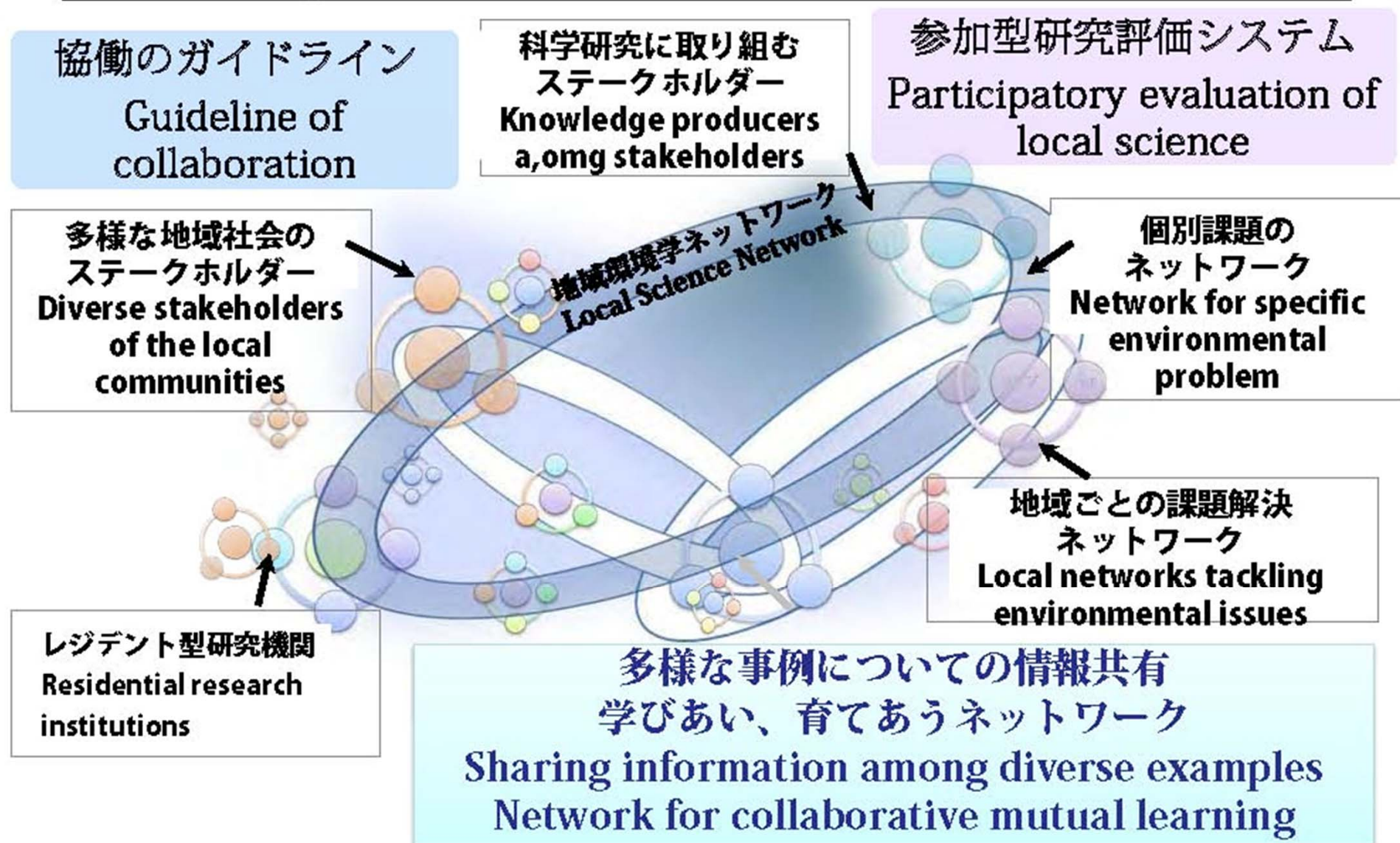
A Guideline for Ecological Risk Management Procedures

(Rossberg et al., 2005; Landscape Ecol Eng)



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

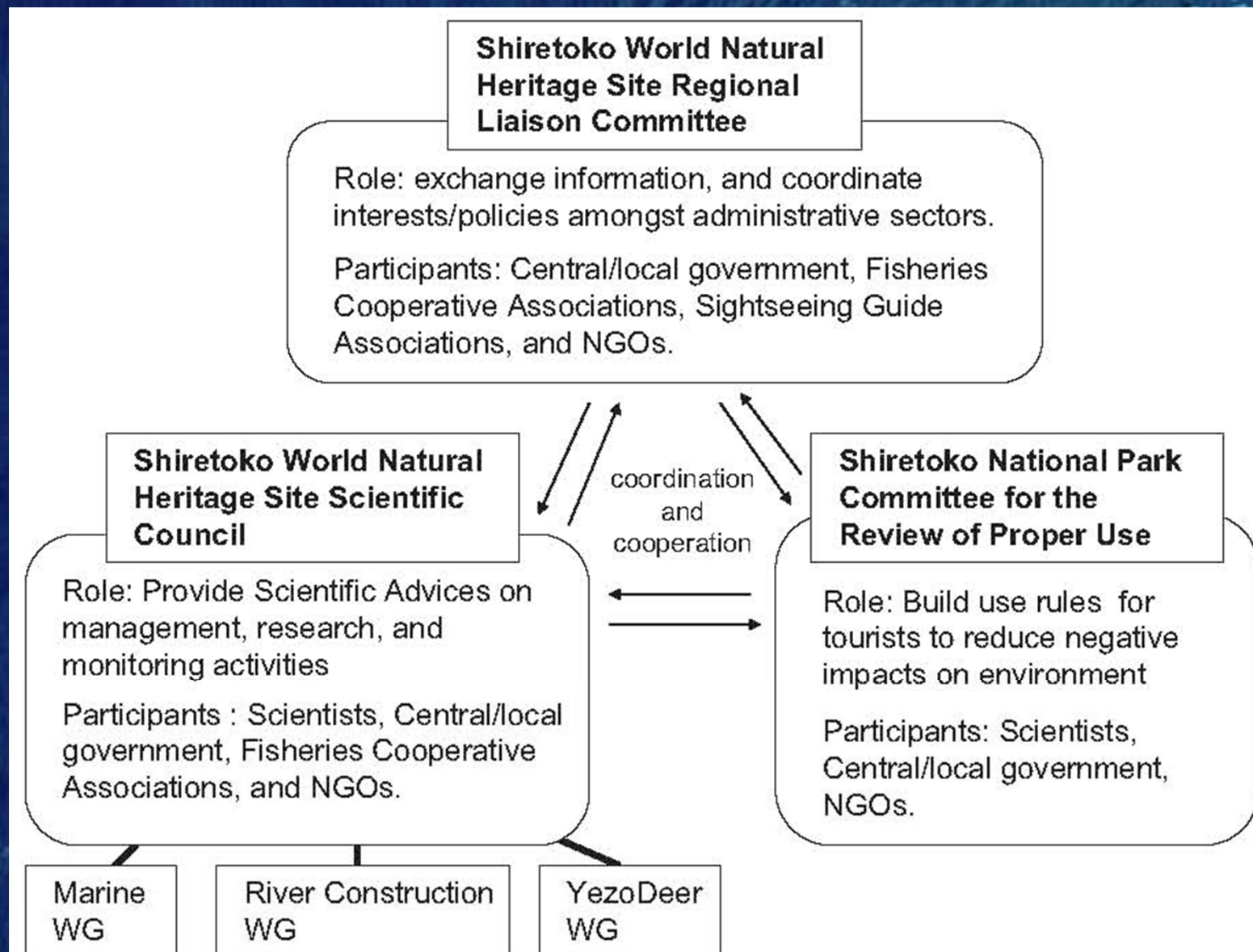
Structure of the Local Science Network for Environment and Sustainability



Coordinating System in Shiretoko WNH Site

Expanding fisheries co-management to ecosystem-based management: A case in the Shiretoko World Natural Heritage area, Japan

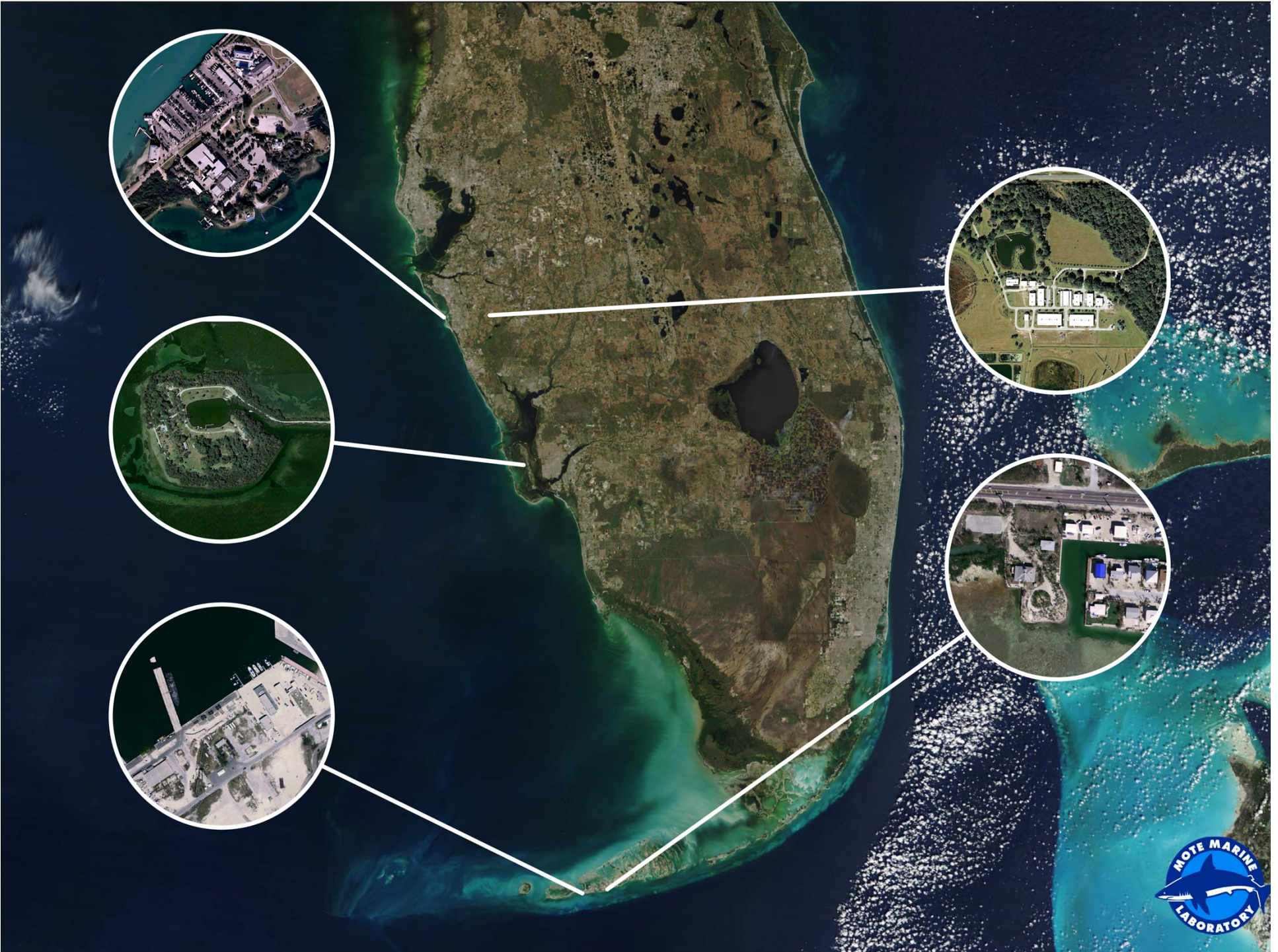
(Makino et al., 2009; *Marine Policy*)





**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*

South China Sea Islands



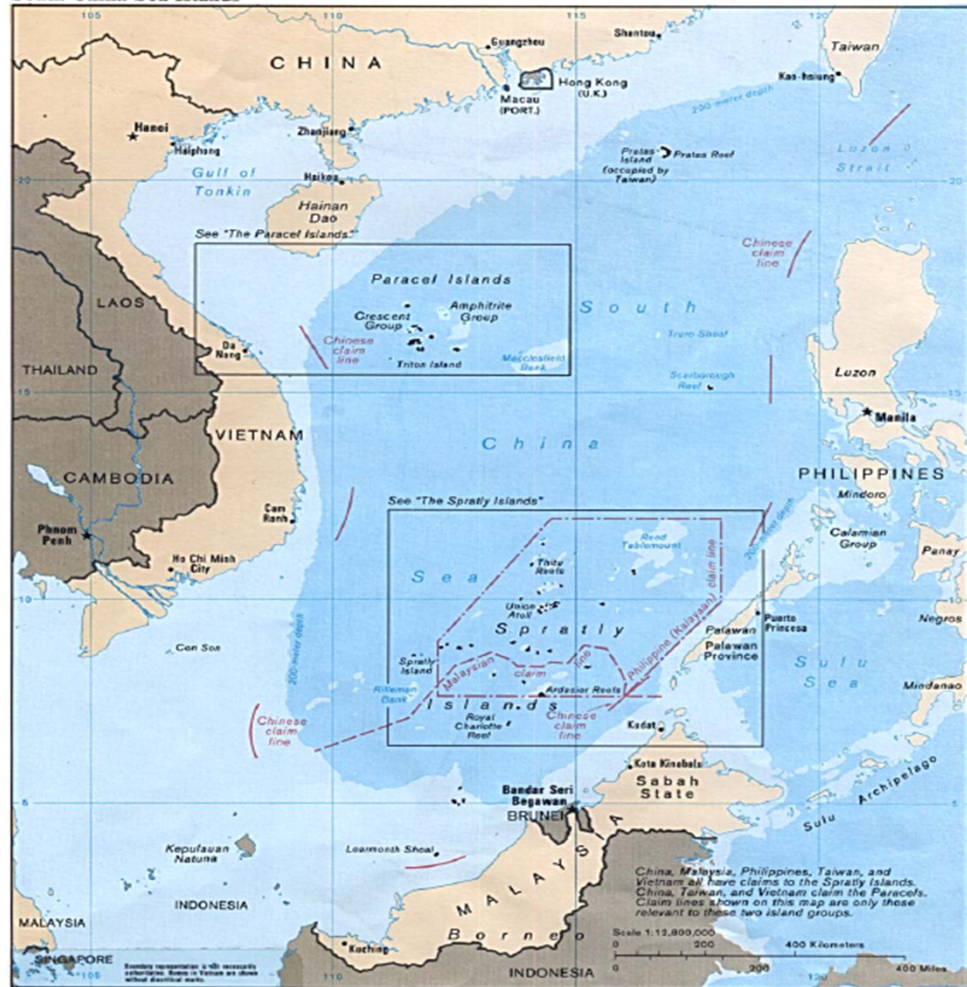
The 4th Conference on the Protected Areas of East Asia IUCN/WCPA-EA-4 March 2002 - Taiwan Marine Session Recommendation for East Asia

*“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 10th 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**

South China Sea Islands

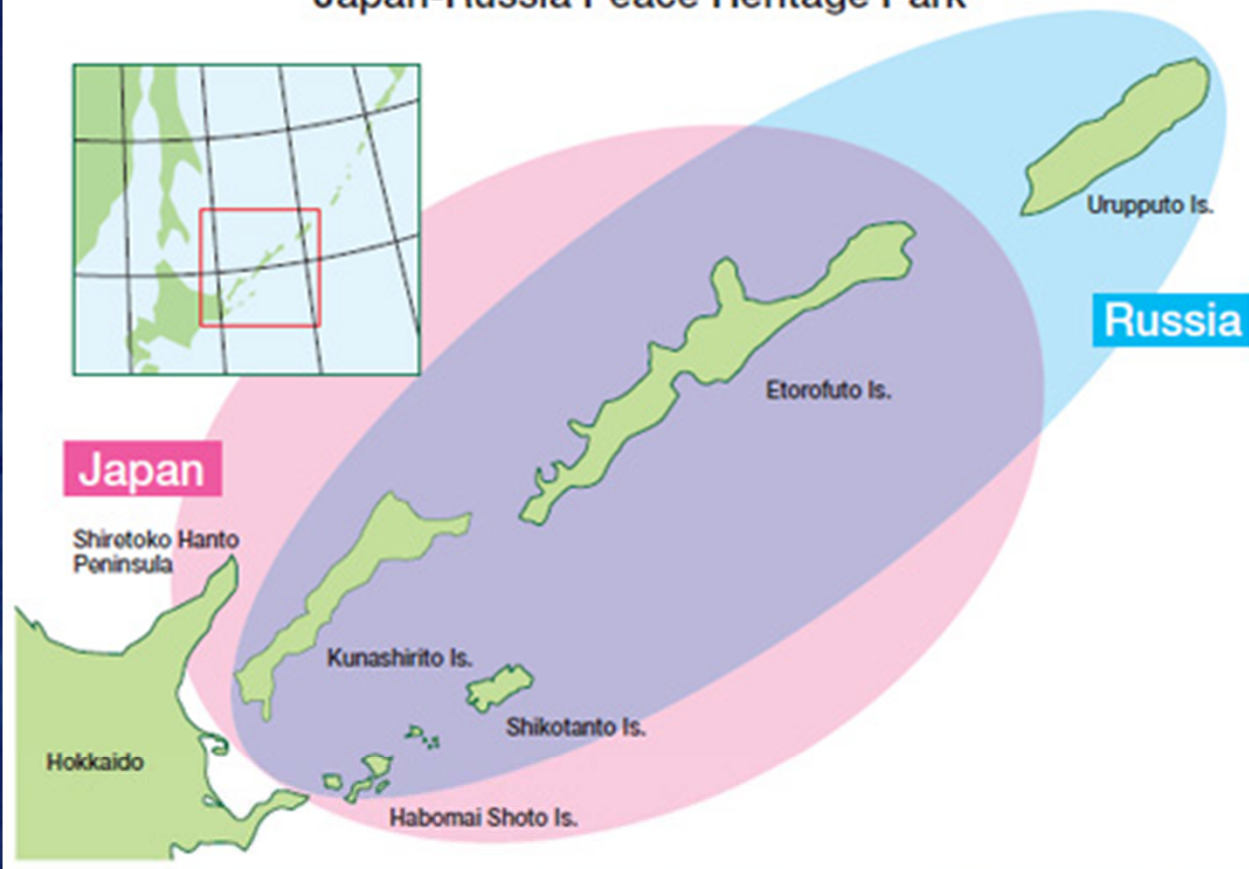


Consensus Recommendation

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.



(Plan) World Heritage Shiretoko site Expanding Project Japan-Russia Peace Heritage Park



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.*

