S2S Transdisciplinary Approach to Collaborative Research & Knowledge Sharing and On Field Monitoring

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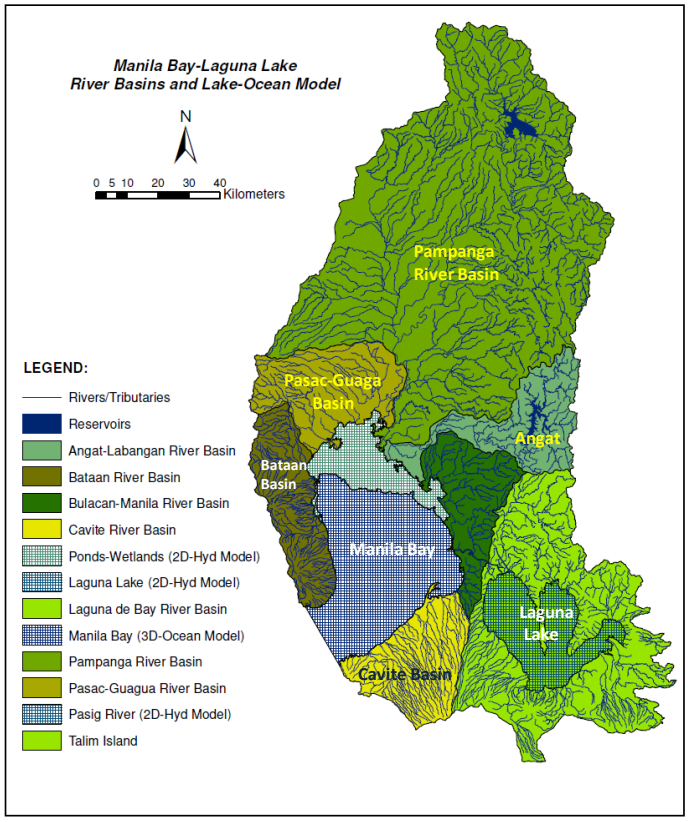
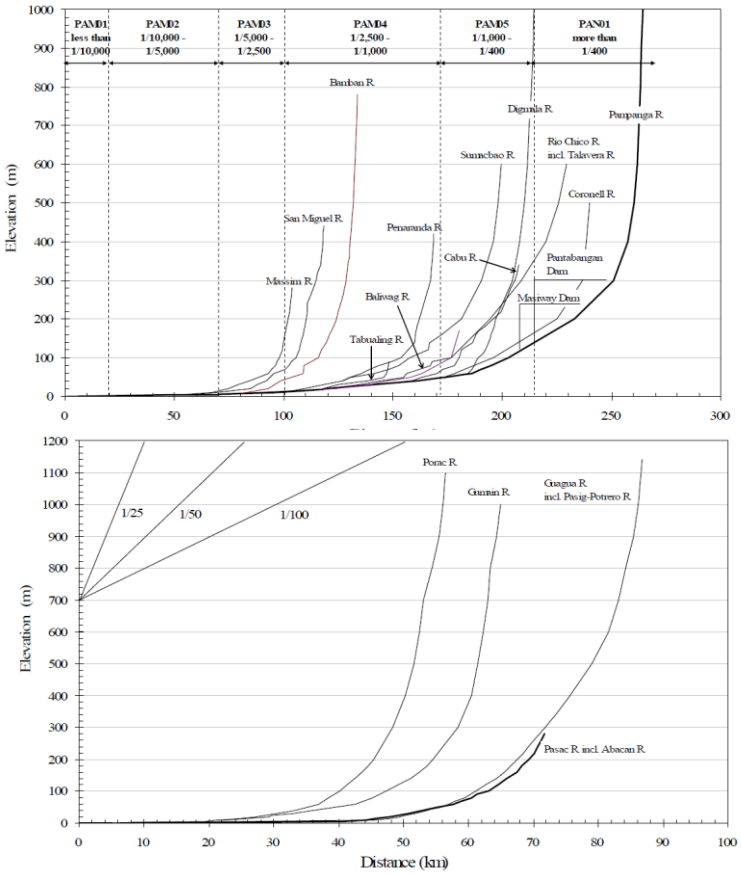
A humid tropic and archipelagic country like the Philippines is typified by land mass drained by a river system, its lakes and tributaries and connected aquifers quickly join the deltas and estuaries, coastlines and near-shore sea and open ocean.

Thus, coordinated development and management of water, land, coastal and related resources as source-to-sea (S2S) continuum (in contrast to hydrological units) combining IWRM and ICM.





Transdisciplinary Approach to S2S IWRM/ICM Management

- Combined IWRM/ICM encompass various disciplines from physical sciences, socio-economics, political science, to social, cultural and behavioral sciences.
- Thus the need for transdisciplinary approach in contrast to other disciplinarities.

Monodisciplinary	Multidisciplinary	Interdisciplinary	Transdisciplinary
• reactive • isolated approach by individual experts	• proactive • additive approach bringing together a wide range of experts	• integrative • experts and stakeholders solve a problem by parts then integrate	• interactive and holistic • experts and stakeholders solve problem as a whole through interaction of parts

Elements of Transdisciplinary Approach

- Stakeholder engagement to solve problems through integrated, participatory and collaborative learning, research and consensus building.
- iterative process like "learning as you do it and doing as you learn"
- work collectively from problem identification, knowledge generation and actions to project implementation.
- decisions are made on hierarchical basis in the order of (i) satisfying physical laws and constraints, (ii) environmentally sound, (iii) economically beneficial, (iv) socially justifiable, and (v) politically acceptable.

Air Environment
- atmospheric flow
- heating and cooling
- pollutant dispersion

Terrestrial Fauna/Flora
- *forest resources*
- *insects and birds*

Built Environment
- infrastructures
- agriculture
- wastewater

Human Settlements
- *communities and informed citizens*
- *socio-economic & culture*

Aquatic Flora/Fauna
- *primary productivity*
- *fish and wildlife*

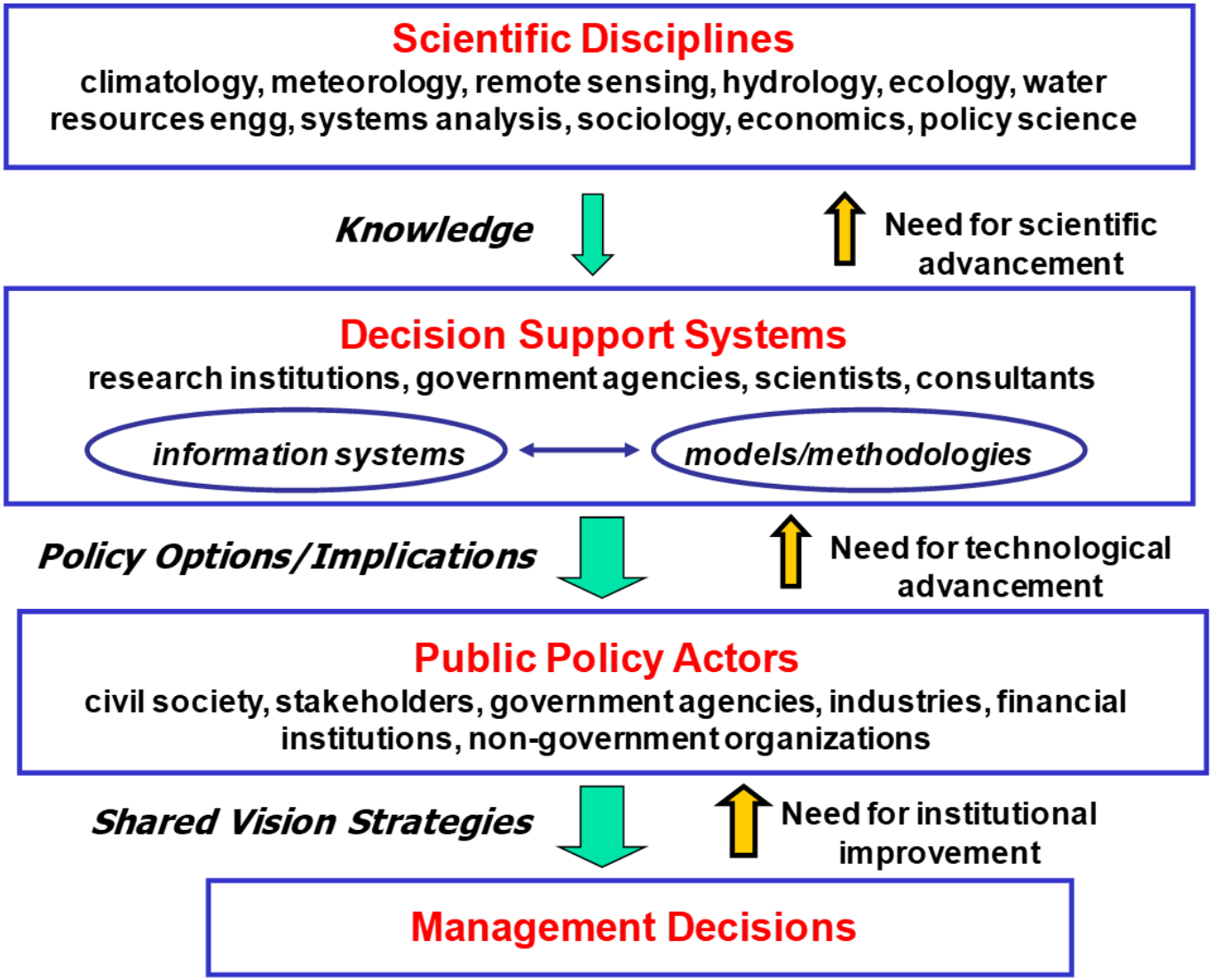
Water Environment
- hydrologic processes
- water quality
- pollution and nutrient transport

Soil Environment
- vadose and saturated zone
- fluvial geomorphology
- groundwater pollution

Studied Environments (black)
Target Environments (red, italics)

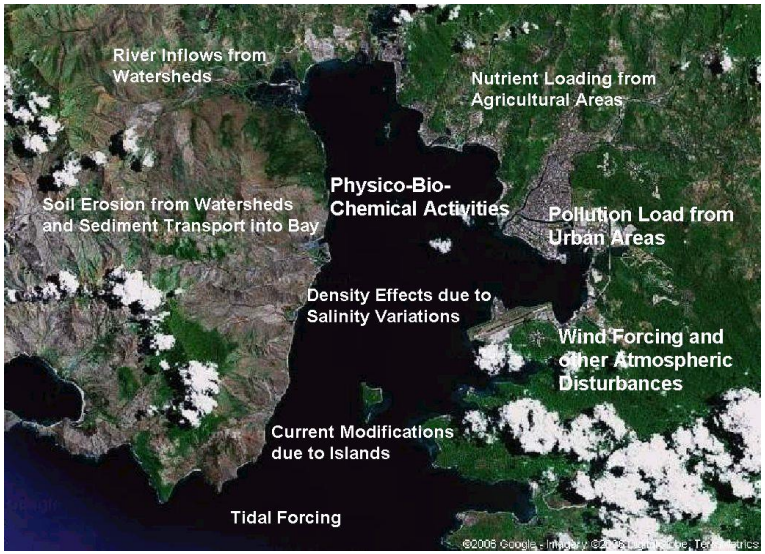
Linking (sharing) research-based and experience-based knowledge to public policy & management decisions in S2S IWRM/ICM through the DSS.

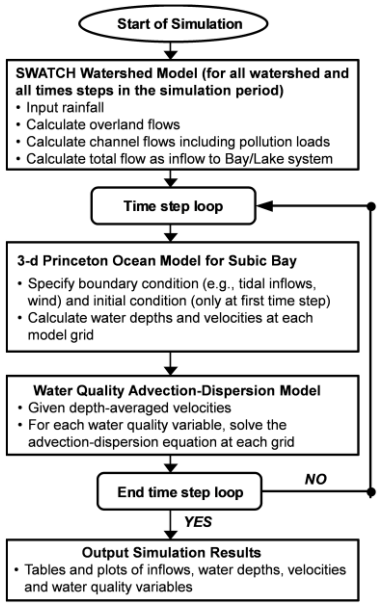
[Adapted from Georgakakos, 2004]



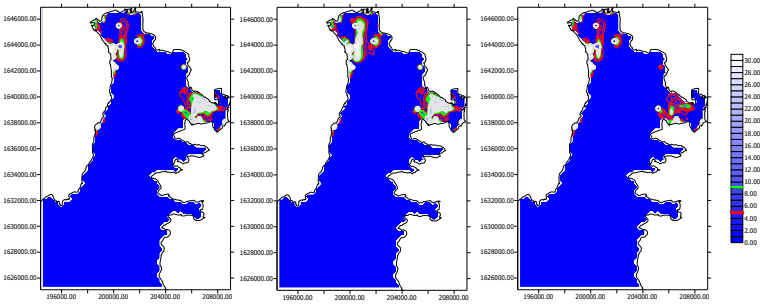
Illustrative Computerized Decision Support System: Subic Bay Hydrodynamic-Water Quality Modeling* As Basis for Developing Policies and Strategies for Integrated Coastal Management Plan (ICMP).

Major Factors Driving Subic Bay Hydrodynamic and Water Quality Processes



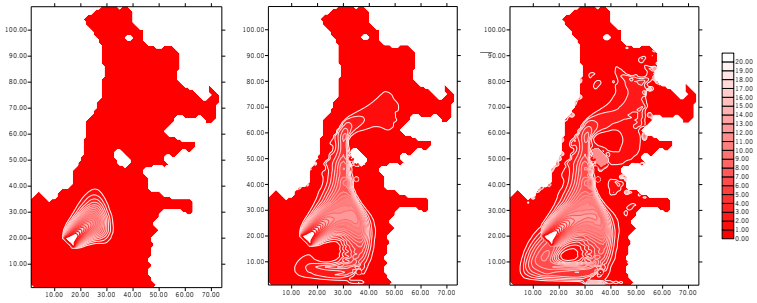


Contours of BOD concentration at 90 days for future scenario 1, future scenario 2, and future scenario 3.



Future Scenario 1 Future Scenario 2 Future Scenario 3

Simulation of conservative tracer (such as diesoline oil spill) from a line pollutant source.



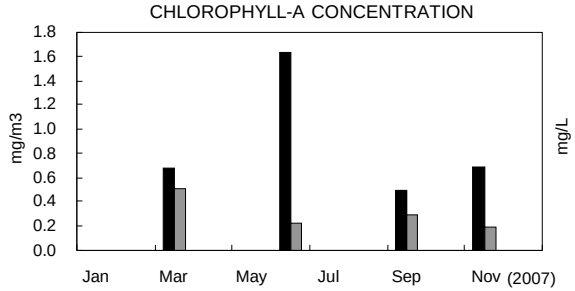
1 day 3 days 5 days

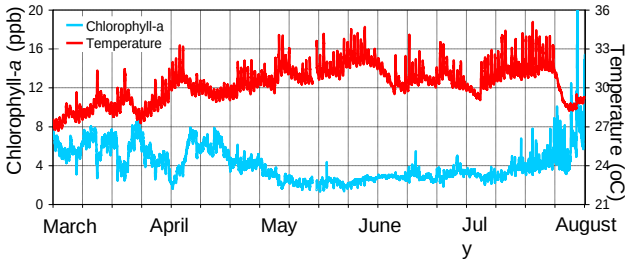
On Field Sampling and Monitoring

Piece-wise (traditional)

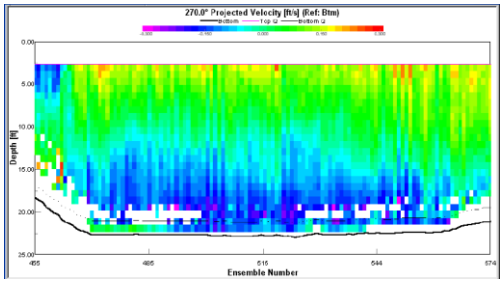
versus

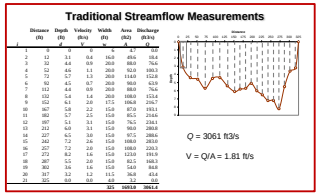
Continuous (modern)





Streamflow Measurement with Acoustic Doppler Current Profiler

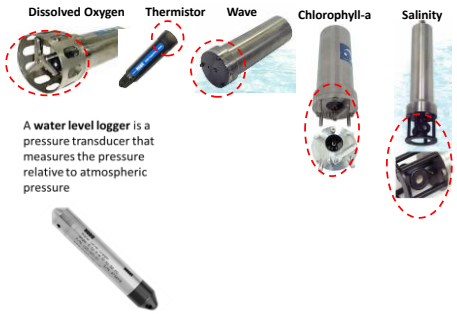




Continuous recording multi-water quality meter

AAQ1183 is a modernized compact and light-weight **multi-parameter water quality meter**. It measures water depth, temperature, conductivity, salinity, turbidity, chlorophyll, dissolved oxygen, and pH.

Other Sampling Instruments



Slides courtesy of Dr. Eugene Herrera, ICE-UPD

Last Slide!