Biogeochemistry and Water Quality of the Everglades: Relevance to Restoration

Key Observations and Future Directions

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Biogeochemistry and Water Quality of the Everglades: Relevance to Restoration

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- Introduction
- Sources and types of nutrients and contaminants
- Landscape patterns
- Biogeochemical transformations
- Biogeochemcial responses
- Transport processes
- Modeling and integrated analysis
- Case studies
- Synthesis and relevance to restoration
- Recommendations and Future Directions

Key Observations

- Natural and anthorpogenic nutrients and contaminants are identified
- Phosphorus fate and transport processes are heavily studied
- Landscape patterns nutrients in various ecosystem components is well established
- More information is emerging on other nutrients and contaminants
- Linkages between biogeochemical processes and biotic communities (vegetation, periphyton, and microbes)
- Research conducted at multiple scales.. Molecular to landscape level, but lacks integration across scales
- Linkage between phosphorus biogeochemistry and other elemental cycles is recognized

Key Observations

- Legacy nutrients especially phosphorus is now considered as key regulator of restoration
- Cycling of sulfur and mercury is now linked to hydrology and loading of nutrients and contaminants
- Multiple groups working on similar topics… lacks integration and coordination
- More holistic and intergrated approach to address complex issues is needed
- Several modelling approches are emerging, but clear utility of these models by managers is not demonstrated
- Connection between experimentalists and modelers is lacking
- Relevance of key research findings to restoration and management are not clearly established

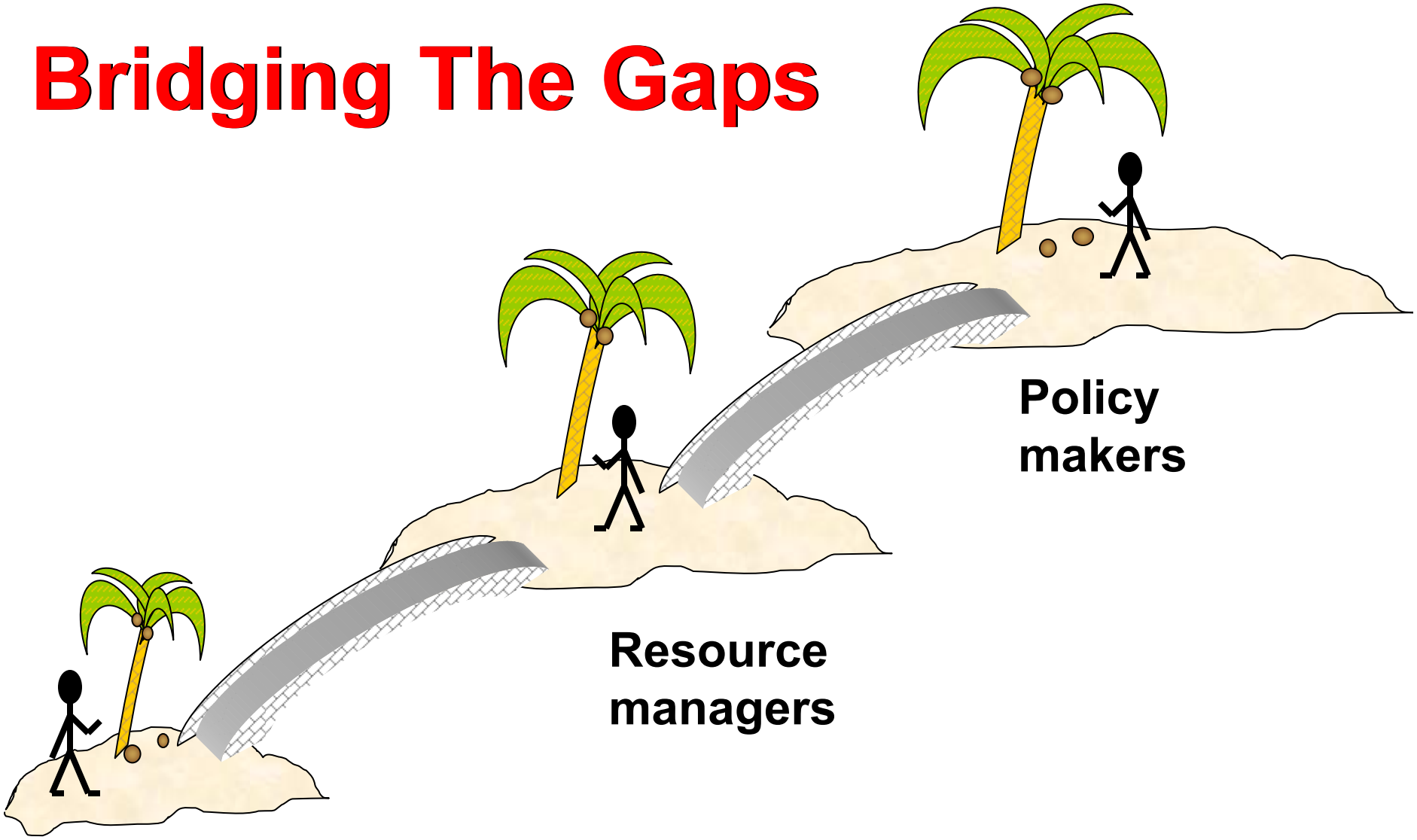
Future Directions

- Hydrologic restoration must be celarly linked to water quality, especially with respect to rehydration
- Mutual dependency of one cycle over another (feedbacks and controls)
- Linkages between biogeochemical processes and biotic communities (e.g., vegetation, periphyton, and microbes)
- Integration across scales (molecular to landscape)
- Integration of biogeochemical measurements across scales using statistical, geospatial, and process-based models.
- For adaptive implementation, relevant synthesis of new information and feedback is needed

Future Directions

- Influence of extreme events (resulting from climate change) on biogeochemical processes
- Influence of sealevel rise on biogeochemical processes
- Role of restoration on greenhouse gas emissions
- Current restoration strategies should be linked to other ecosytems services such carbon sequestration
- Need to strengthen the linkage between researchers, managers, and policy makers

Bridging The Gaps



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