

APPLYING ECOSYSTEM SERVICES FOR RIVERINE TRANSPORT INFRASTRUCTURE PROJECTS

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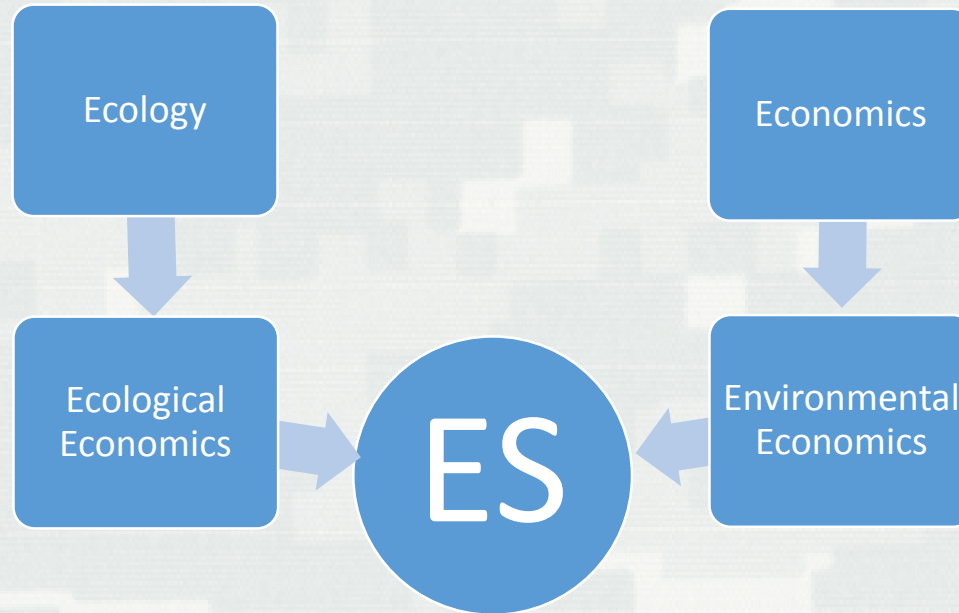
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The community of waterborne transport organizations has been a global economic engine with profound impacts on trade and commerce in every country around the world.



Ecosystem Services



We need to integrate the Ecosystems Services concept to the Waterborne Transport Infrastructure (WTI) community in the deployment, planning, designing and/or maintenance of WTI projects.



Key Questions

- **What are ES in general, what are the underlying ideas and concepts?**
- **How can the ES concept be applied in WTI design and maintenance?**
- **In which contexts can ES concepts be utilized best?**
- **How do ES concepts relate to other WTI relevant subjects, specifically Working with Nature, Environmental Risk Management, and Climate Change?**



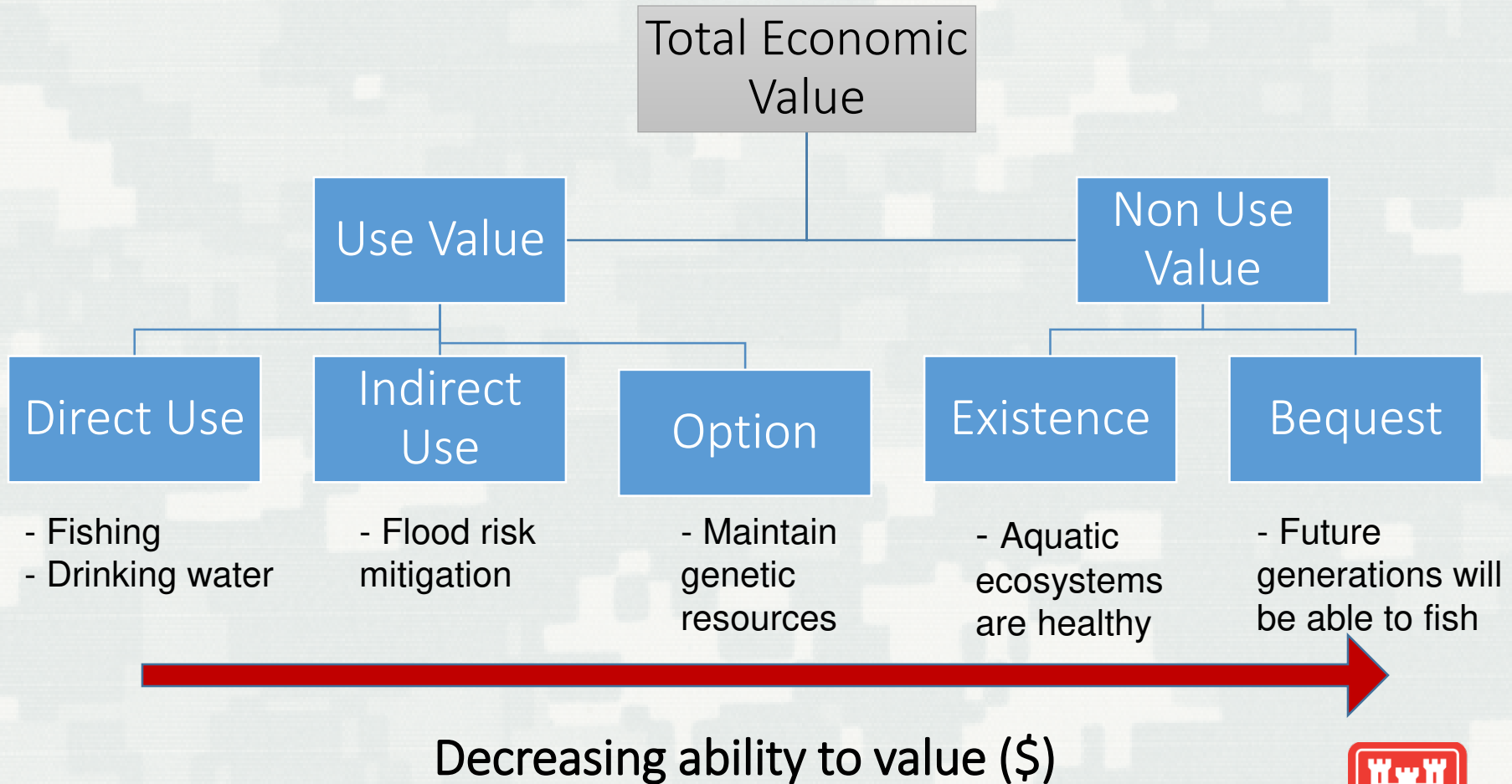
Target Community

- **Port owners, operators or managers:** responsible for adaptations to their Ports and the incorporation of the ES concept.
- **Public authorities:** empowered to encourage and facilitate the incorporation of the ES concept in WTI projects.
- **Consultants and Contractors:** able to incorporate the ES concept during study and design phase as well as during construction of WTI projects.
- **Financers:** understand the need to incorporate the ES concept and the need to invest maybe more on the short run to have benefits on the long run in order to develop adequate packages to finance the implementation of the ES Concept.
- **NGO's:** able to stimulate their external input to enhance and inspire the ES concept within WTI projects.
- **Academic institutions:** stimulate and carry out research and to share the findings and recommendations.



Total Economic Value

Sum of use and non-use values



How To Approach Ecosystem Services

Short Term Gains



Long Term Vision



Island Protection and Restoration

Pool 8 Islands HREP Phase II, near Stoddard, Wisconsin



October 1961

August 1994

August 2000

Have We Documented the Ecosystem Services Provided?

Kreetsand Tidal Shallow Water Area



The model results were used to design habitats within the area in a way that improves ecosystem services provisioning while reducing tidal energy.

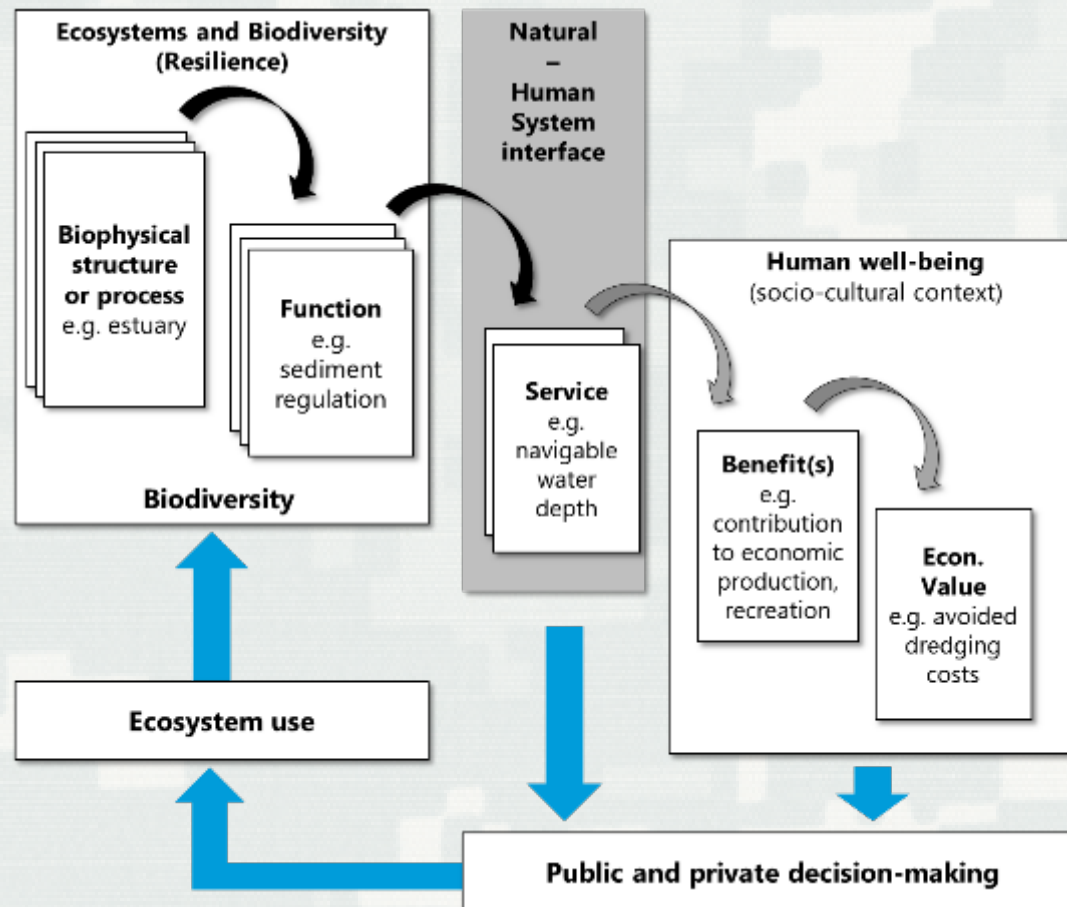


Ecosystem Services Can Be Classified In Three Broad Categories

- **Provisioning Service**
 - Commercial Fisheries
 - Wood Logging
- **Cultural Services**
 - Nature For Education And Research
 - Enjoyment Of Natural Landscapes
- **Regulating Services**
 - Carbon Storage
 - Protection Against Erosion



Ecosystem Services Cascade Model

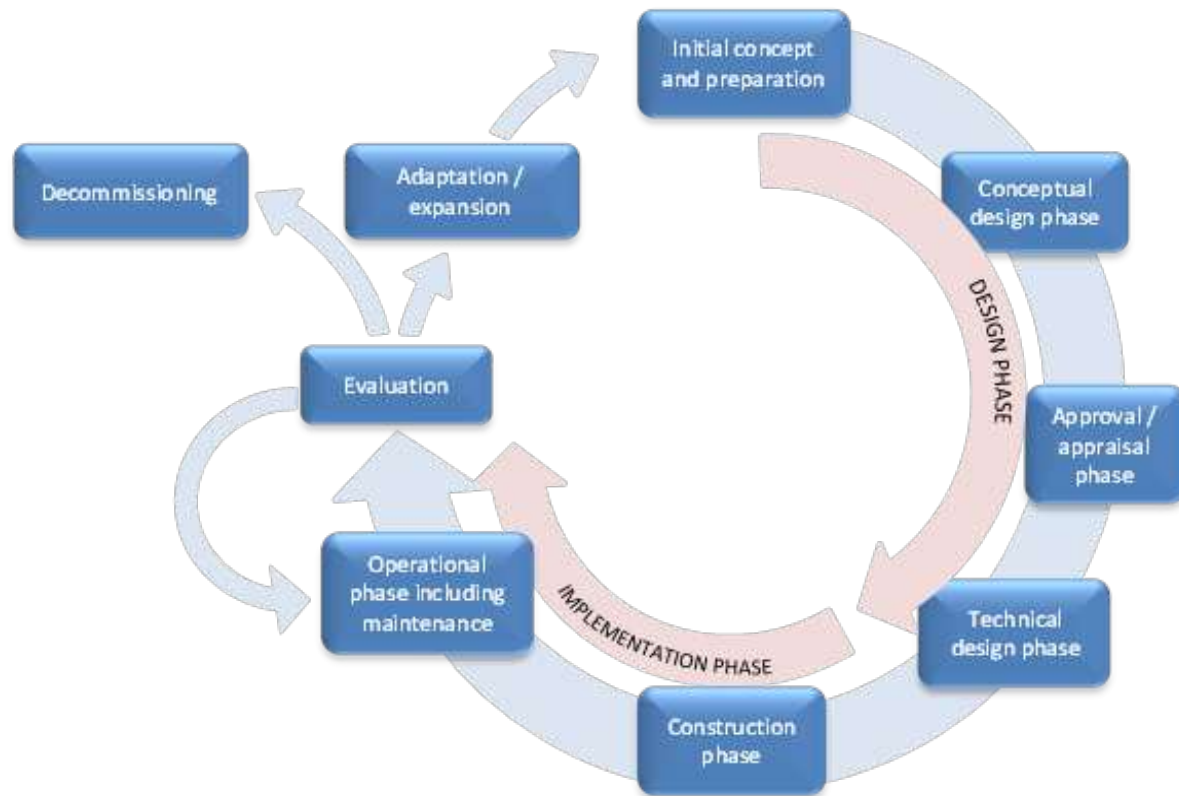


The model illustrates how ES derive from ecosystem structures and functions, are linked to human well-being and how they are used in management of the ecosystems.

(Adapted from MEA 2005).



Project Development Cycle



Water Transport Infrastructure (WTI) projects generally follow an iterative cycle. The project cycle includes roughly three different phases, and the application of ES in WTI projects is imperative in all these phases.

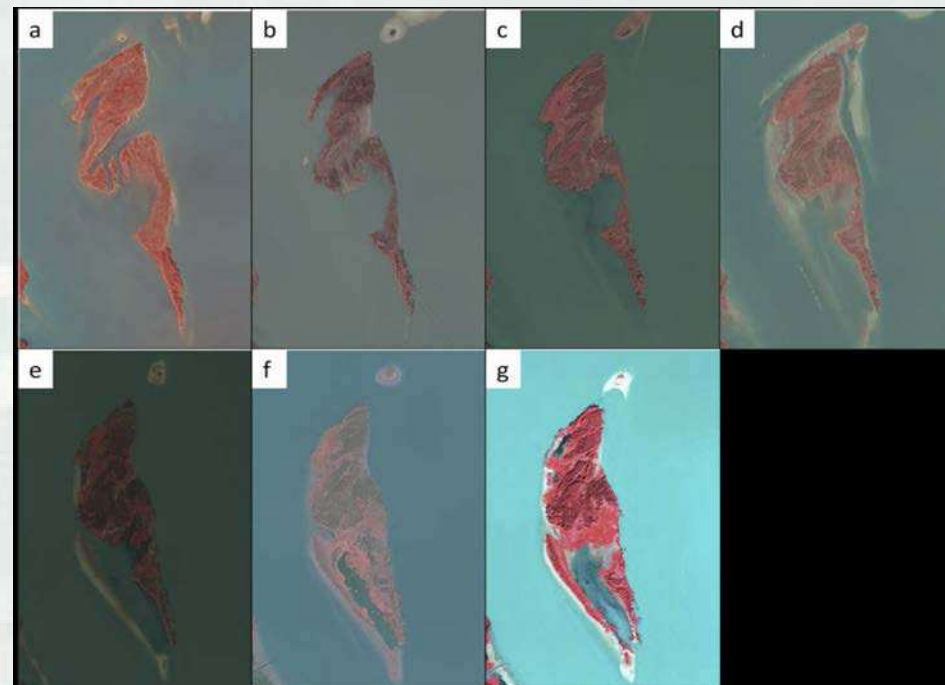
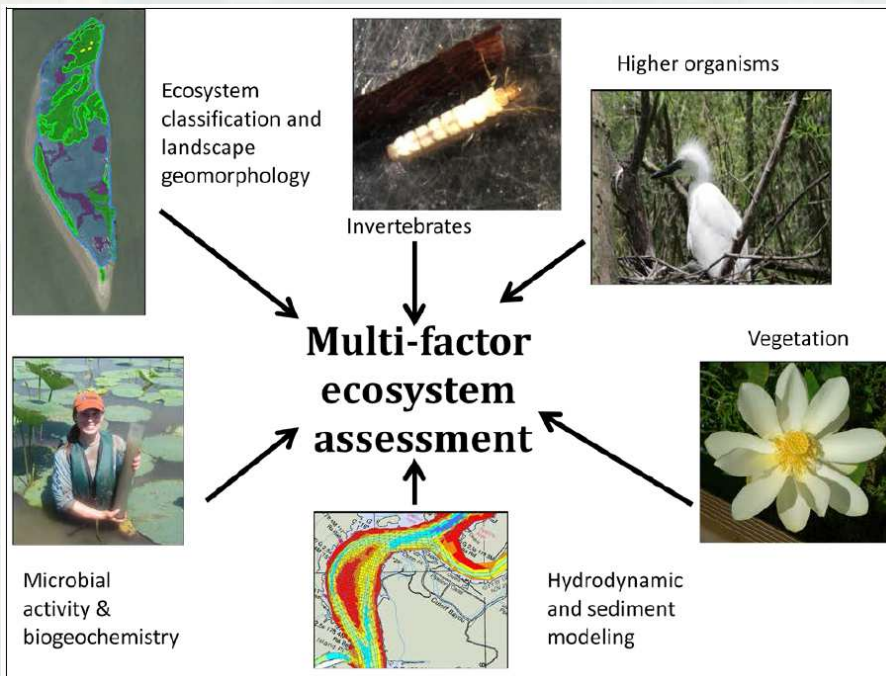
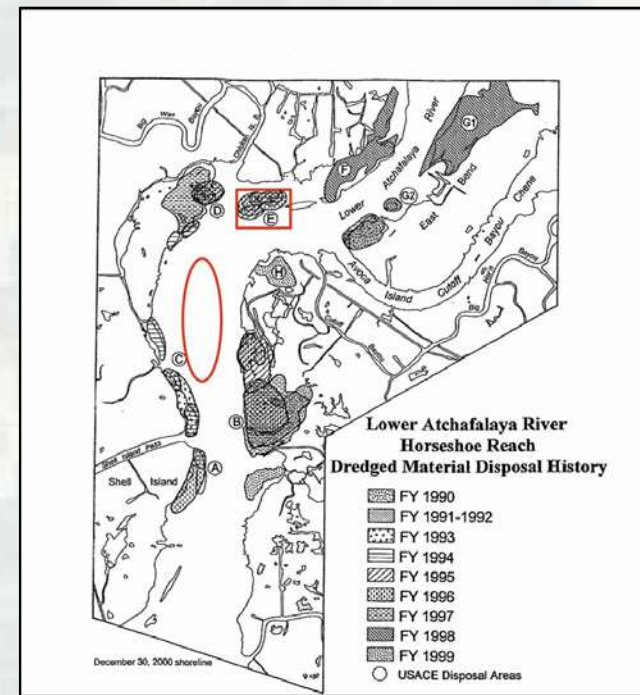


Horseshoe Bend

Problem: Limited options for dredged material placement alternatives

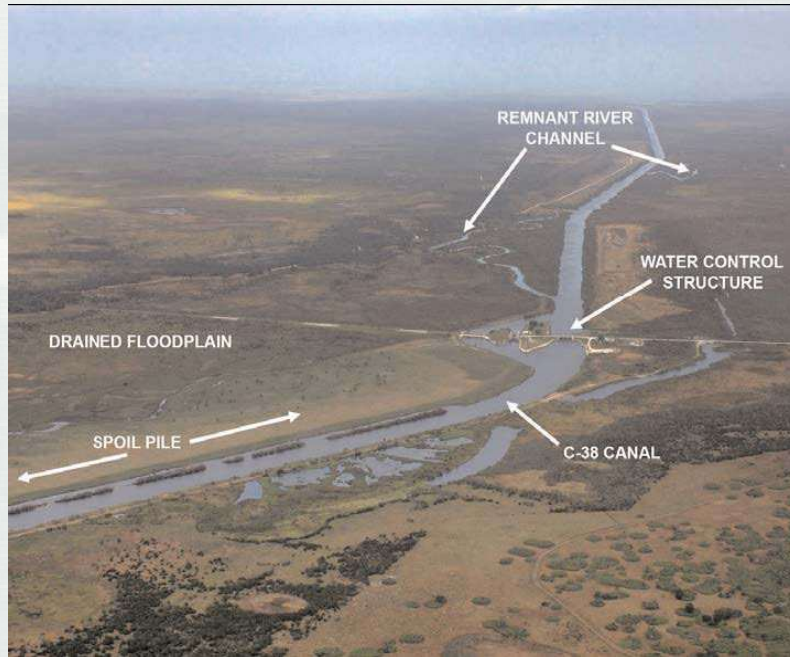
Solution: Innovative EWN placement technique created wetland island

Approach: Ecological assessment documented environmental Goods and Services (EGS) benefits



Remeandering

Kissimmee River, FL

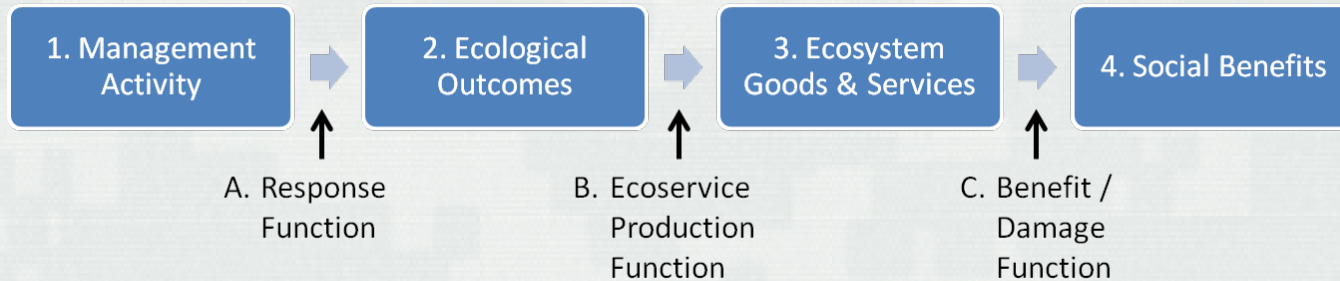


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Framework

Conceptual Model for developing Quantitative ES Assessment Results



- *Response Function* estimates the expected changes in ecological outcomes when conditions and stressors change.
- The *Ecoservice Production Function* determines whether services are produced..
- The *Benefit/Damage Function* determines the value of the change in services.



Case Study Template

INTEGRATING ECOSYSTEM SERVICES INTO WATERBORNE TRANSPORT INFRASTRUCTURE

GENERAL INFORMATION

Name of project	
Country	
Project location (nearest town or city)	

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