Tethys – Knowledge Management System for Marine and Hydrokinetic Energy Development

Opportunities for Collaboration with Marine Multipurpose Cadastre

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Working Notes
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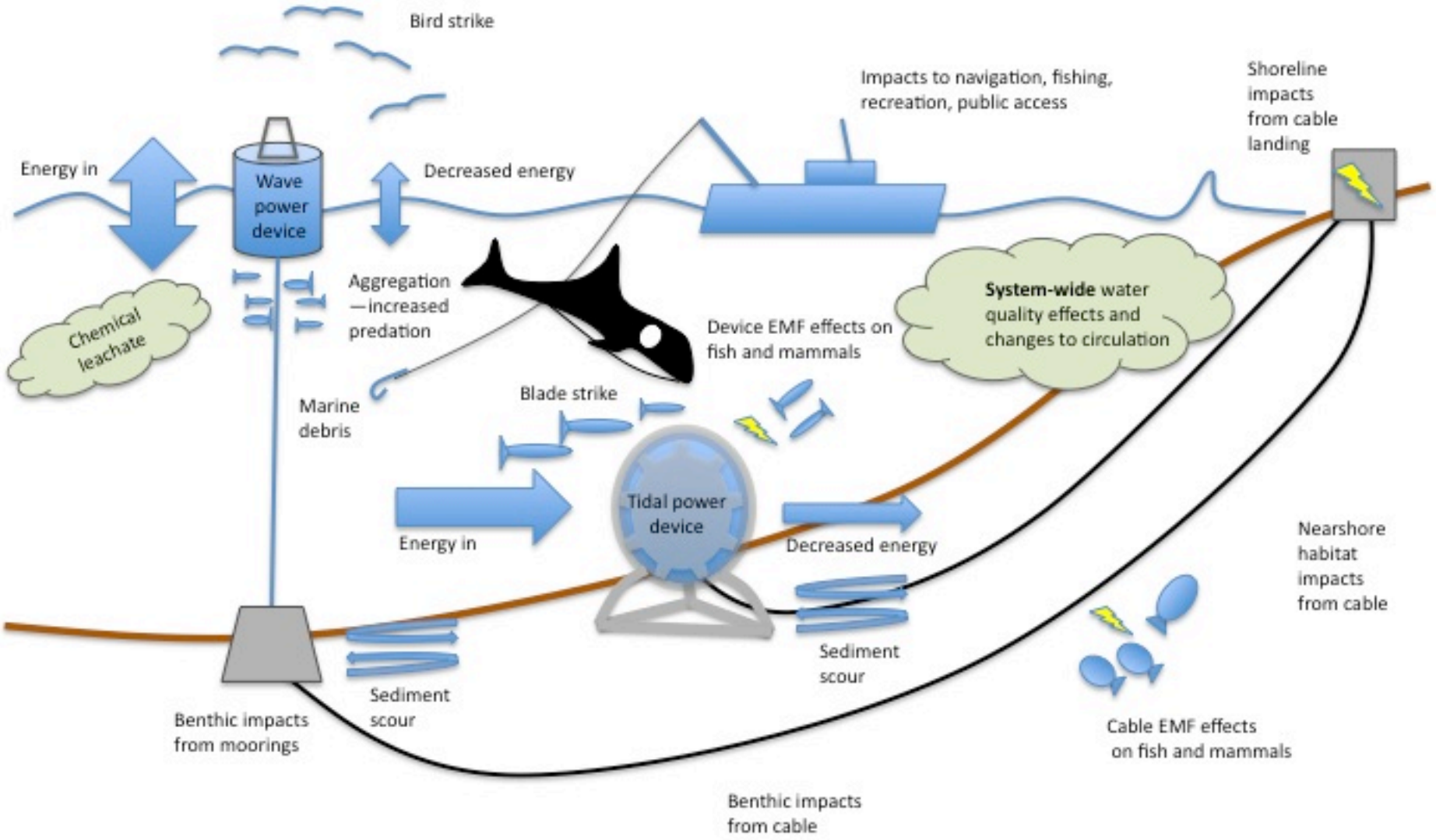
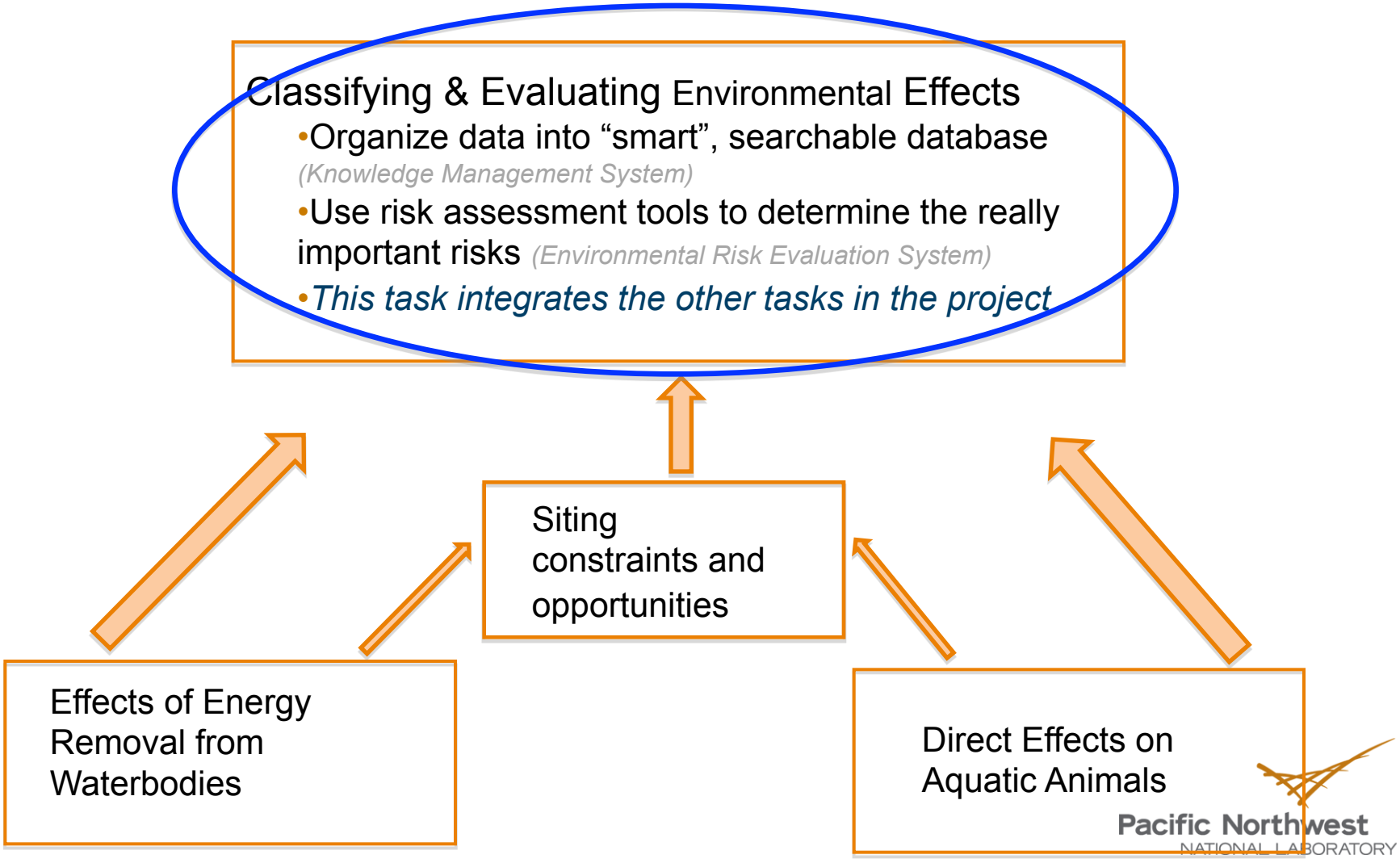
Potential Environmental Impacts of Marine and Hydrokinetic Energy Devices



PNNL Projects: Science to Design, Deploy, and Operate Ocean Energy Devices in Environmentally Responsible Manner



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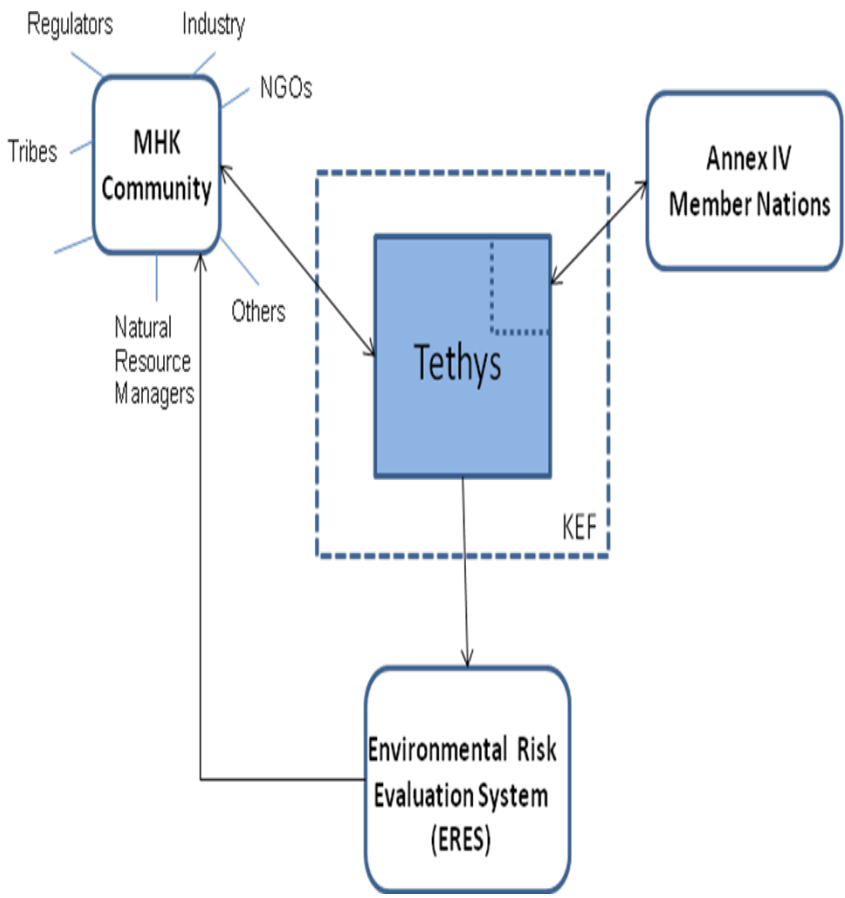
MHK Knowledge Management System, aka *Tethys*

- Named for Greek Titan goddess
- Primary function of the system is as a knowledge base to support the risk framework (ERES)
  - Evidence collection and marshalling
  - Data navigation and management of risk model results
- Other functions expected to be important
  - Knowledge portal for various stakeholders
  - Portal to other knowledge sources (e.g., Annex IV database under construction)
  - Collaborative environment for MHK research community
- Functionality created through interviews with users



Complexity of data management needs for MHK

THE DATA

- Many sources, origins of data: laboratory results, modeling runs, field data, scientific papers
- Many data types: tabular, geospatial, pdfs, maps, photos, video
- Many marine receptors of concern: marine mammals, birds, fish, turtles, also hydrodynamics, sediment transport, water quality, other ocean uses

THE AUDIENCE

- MHK project developers, regulators, researchers, stakeholders

- Lots of challenges to house, organize, and make these data accessible

WHAT IS NEEDED IN AN MHK DATABASE?

- Flexibility for data intake of many types
- Good user interface for input and query/display of data
- Ability to tag data for QC, other information
- Easy linkage to other databases
- Automated data intake
- Extensible for related uses

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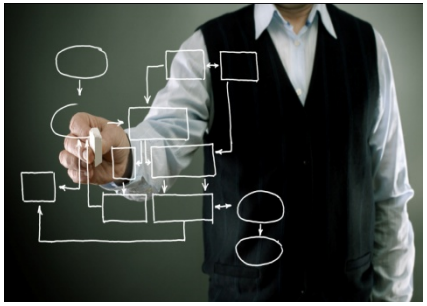
User Requirements – Elicitation Process

- User requirements extracted from *five Use Case Scenarios*
- Based on 8 one-hour telephone interviews with stakeholders
- Stakeholders represented the following groups:
  - Federal regulators
  - State regulators
  - MHK technology developers
  - MHK researchers
  - Tribal fish biologists and managers
  - NGO



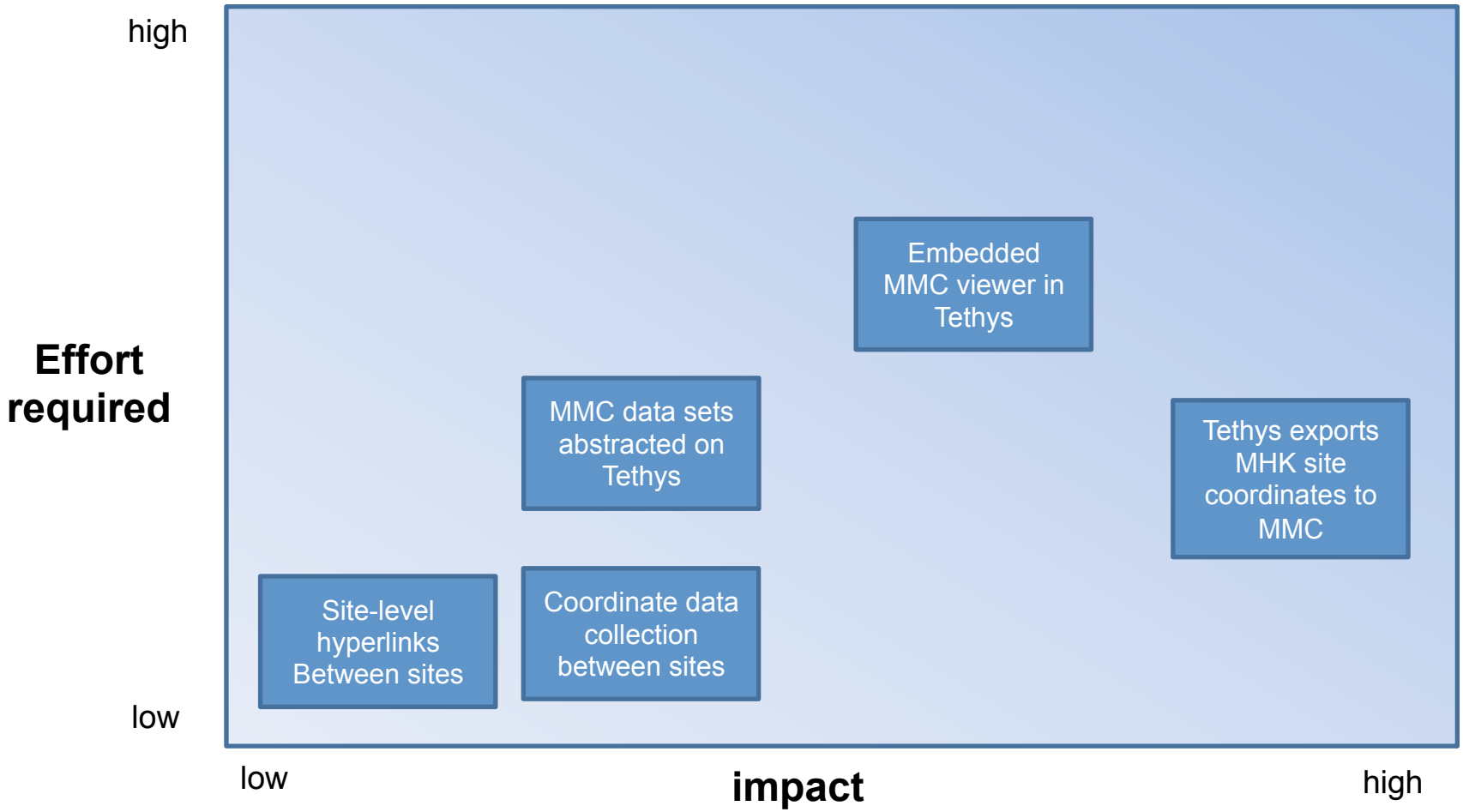
Geospatial Data Availability and Presentation are Prominent Among Identified User Needs for Tethys

User Needs	Example of Functionality
High degree of geospatial resolution	Ability to put data into geospatial context, including 3D
Transparency into ERES process and the underlying data	Access to all available data
Ability to associate data with specific sites, MHK technologies, and environmental impacts	Tools that associate each data item with another; clear and consistent tagging of data
Multiple presentation formats for searching, navigating, and presenting data and documents	Features such as: project timeline**, map-based displays**, model/scenario-centric visualizations

Key Drivers for Collaboration

- Avoid duplication of effort, and leverage our respective strengths and charters
- Add value to Marine Cadastre data, by:
  - Linking geospatial data sets in MMC with information from Tethys about MHK projects
  - Providing MMC with access to additional GIS datasets (i.e., FERC sites)
  - Providing access to a larger community of users
- Add geospatial capabilities to Tethys, and:
  - Meet a key user requirement/expectation of our system
  - Allow map-based navigation of Tethys knowledge base
  - Providing access to a larger community of users

Range of Possible Approaches



Conclusion - MMC and Tethys

- *Tethys* and MMC serve largely complementary purposes
  - Tethys as a knowledge base for MHK environmental information, has a strong need for Geospatial data and context
  - MMC, as the key repository for marine geospatial data, seeks strong application niches where its data can be utilized, and added to
- Collaboration between sites could take many forms
  - From low effort/low pay-off, to more labor intensive sharing of data
  - Strategies are not necessarily mutually exclusive, and can represent a logical incremental path to tighter collaboration

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