

Research questions

Natural dynamics

Ecological

Ecosystem as nexus between social and physical dynamics – what are the ecosystem goods and services at risk from human activities? What are the social drivers causing these activities? What are the human needs? What dynamics alter ecosystem performance? Case studies as one approach.

Summary: Identify and if possible quantify ecosystem goods and services that have the strongest tie to delta dynamics.

Physical

How do basinal processes influence delta form? How do watershed processes influence? What's driving subsidence in deltas? How does compaction work, and how have humans accelerated it?

Eco-physical

How do deltas form? How do physical and biotic processes co-organize to produce the space-time patterns of deltas? Which elements of the biota are most important? How do these processes depend on scale? E.g. certain species of *Spartina* that are especially effective at binding stabilization.

How much of our understanding of floodplains be applied to deltas including management?

How can we develop baseline (“natural”) conditions for deltas to serve as a reference for measuring human impact? (living sustainably, and assigning responsibility)

What are the main stresses on deltas (physical and social)? How do external stresses interact with internal self-organization processes?

How much of our understanding of floodplains be applied to deltas including management?

What is the role of extreme events vs ‘normal’ conditions in creating and shaping deltas?

Human dynamics

How have humans accelerated subsidence?

How do humans attempt to, or not, manage those goods and services? Which services require ‘static’ conditions, and which require natural dynamism? What are the tradeoffs among various goods and services?

What are societal/institutional barriers to planning?

How do different value systems and cultures govern decisions for living in deltas and their catchments?

How can knowledge generated through research be used to reduce delta vulnerability?

Can we speed the rate of insight transfer such that we reduce vulnerability faster than

human and natural drivers are increasing it? E.g. 'co-production' of knowledge (participatory knowledge production) is known to be an effective accelerator.

Meshing social and natural dynamics

How big a problem is this? At the global scale, what are the risks, how many deltas are at risk, how severely, and how many people are affected?

What are the main stresses on deltas (physical and social)? How do external stresses interact with internal self-organization processes?

social science connections: meshing social and natural science drivers

How humans shape and are shaped by the env

How natural and political bnds do and do not coincide and implications for governance

What are effective means by which humans can live sustainably with dynamic natural systems?

How can we merge the intellectual frameworks of the social and natural sciences? E.g. what predictive and modeling frameworks can mix qualitative social science analysis and quantitative natural science analysis?

boundaries and scales – meshing boundaries and scaling

Can we develop better ways of partitioning land use on deltas by identifying 'hot spot' of natural dynamics? Are there management strategies for this?

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