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Sedimentation enhancing strategies for sustainable deltas: Local adaptation to radical transformation

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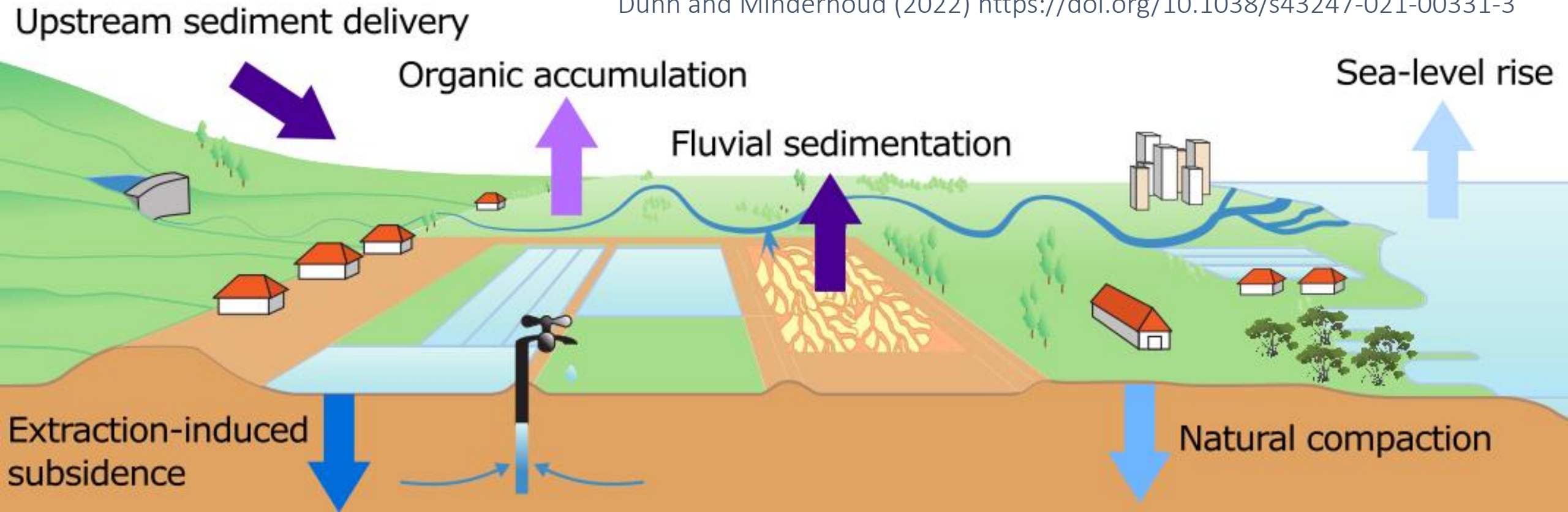
4 Copernicus Institute of Sustainable Development, Faculty of Geosciences, Utrecht University

5 Soil Geography and Landscape Group, Department of Environmental Sciences, Wageningen University

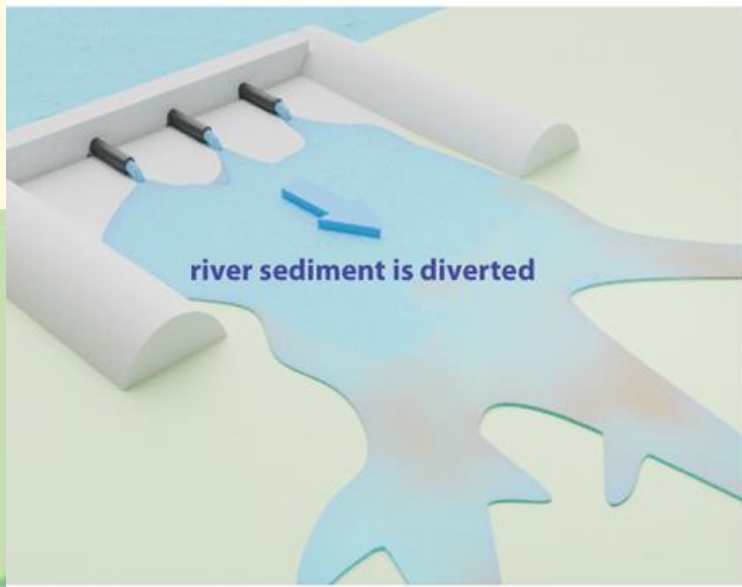
6 Department of Civil, Environmental and Architectural Engineering, University of Padova, Padova, Italy

Delta elevation change processes

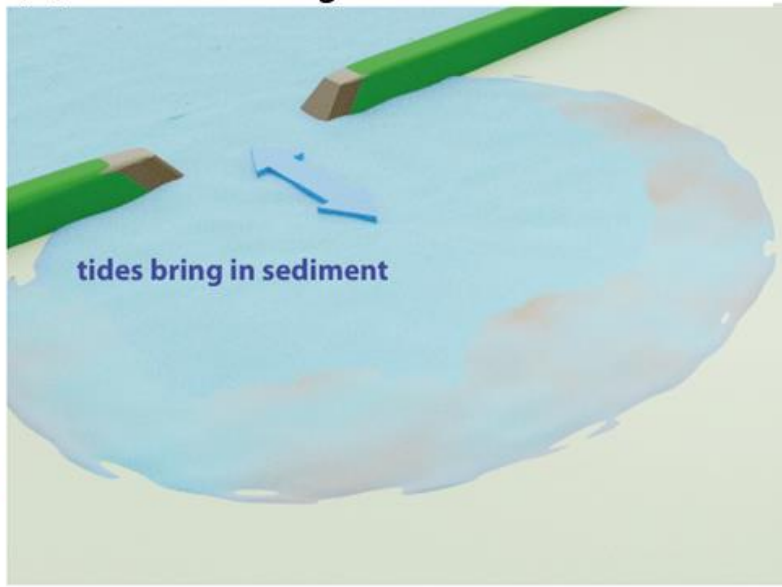
Dunn and Minderhoud (2022) <https://doi.org/10.1038/s43247-021-00331-3>



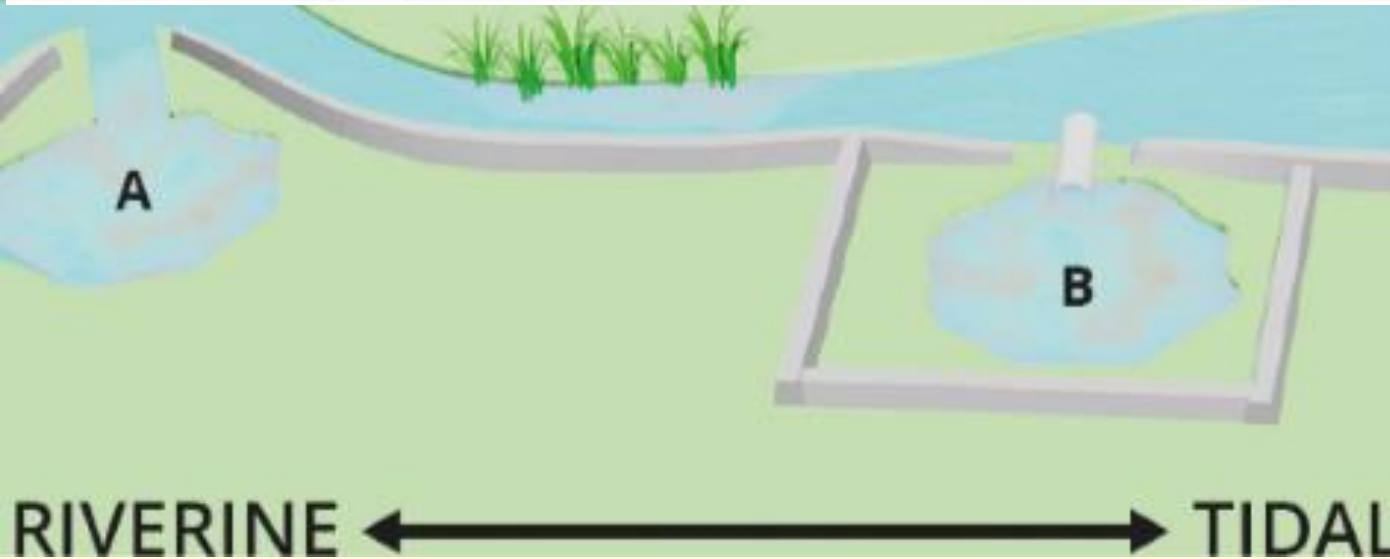
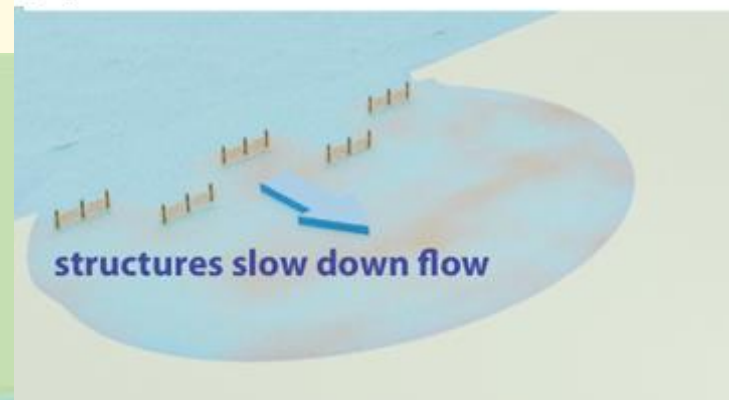
(a) River sediment diversion



(b) Tidal flooding



(c) Sedimentation structures



(d) Vegetation planting



Biophysical challenges for SES

Improved agricultural practices reduce erosion and sediment supply

Less sediment from upstream

SLR and effects

Tidal amplification

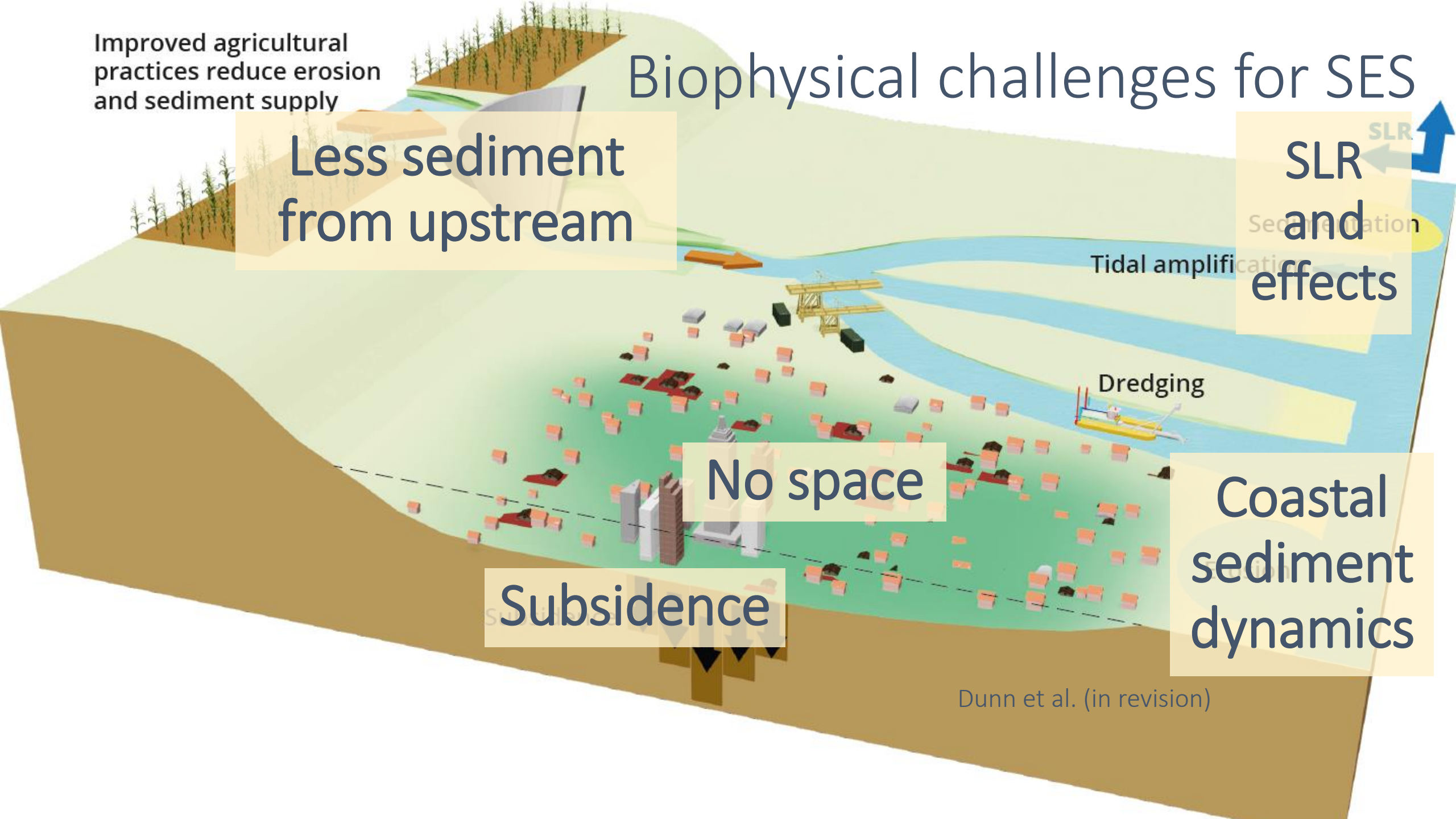
Dredging

No space

Coastal sediment dynamics

Subsidence

Dunn et al. (in revision)



Societal conditions for effective SES

Socio-economic

- Shared land use management
- Finance
- Societal acceptance
- Local knowledge

Governance

- Fit of interests
- Coordination and integration
- Interactive policies
- Governance capacity

Legal

- Land tenure and use
- Transboundary water use
- Migration
- Compensation mechanisms
- Environmental impact assessment
- Monitoring

Conclusions

- Deltas are currently unsustainable socio-environmental systems
- Challenges for SES, and sustainability generally, from socio and environmental sides
- SES are inherently local, reliant on local factors
- What kind of world do we want to live in?