Vegetation Zonation Patterns & Aquifer Structure
DFG - MARZIPAN

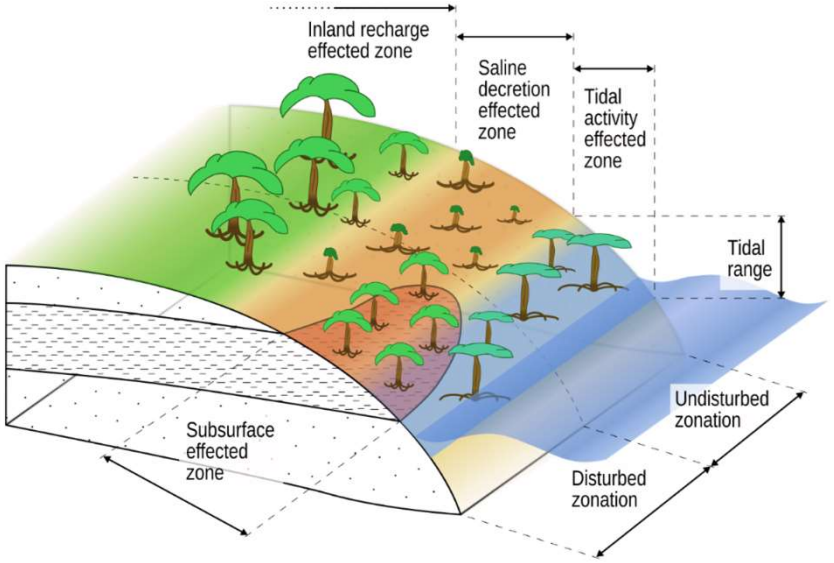
DFG funded CAWR-Project (TUD-BSA, UFZ-ENVINF) to gain information on subsurface aquifer structures from surface vegetation patterns

Rationale:

- Traditional forest models do not consider below-ground processes of plant competition for limited resources
- Aquifer parameterization is limited to point information on larger scales

Aims:

- Gain insight into the relationships between visible vegetation patterns like tree allometry, species composition and zonation and subsurface aquifer structures and potential gradients by tidal and groundwater
- Understand the physical mechanisms of belowground plant interaction and derive a new plant interaction approach for individual based simulation models
- Adopt vegetation zonation patterns to gain information on subsurface aquifer structures and parameterization



Typical mangrove zonation patterns
hypothetically influenced by subsurface properties

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Methods:

- Model coupling of individual-based and continuum-based models utilizing process-based concepts to resemble water flow and mass transport
- Numerical simulation of generic setups with increasing complexity with coupled plant-groundwater model

CAWR-Synthesis:

- BAS expertise in forest informatics, individual-based modeling and mangrove plant communities
- ENVINF expertise in model development and numerical simulation of variable-density flow and transport

Partner:

- Prof. Lovelock (University of Queensland)
- Dr. Jiang (Nanjing Forestry University)

Remote sensing data (GoogleMaps) showing subsurface influence on vegetation