**Objective**

Represent the overland and in-stream erosion, deposition and transportation of processes of suspended (fine-particle) sediment, in order to facilitate the related transportation of C, N and P (primarily organic) in particulate form.

**Approach**

**Major processes**

- Water
- Sediment
- Dissolved C, N, P
- Particulate C, N, P

**Modeling framework (extended)**

**Key assumptions (not changed in near future)**

- Only two types of suspended sediment are included, mud and sand (grain size ~ 0.35mm)
- Mud supply comes from hillslope, bed and bank erosion, while sand supply only comes from bed and bank erosion
- Mud and sand supplies are constrained by water fluxes only
- Changes to topography and geomorphology are not considered

**Major simplifications for the early results (future opportunities!)**

- Hillslope soil erosion rate currently a function of runoff only, effects of soil properties and landuse not incorporated
- Effects of reservoir regulation and trapping mechanisms not included
- Rectangular channel geometry (→ trapezoidal/circular channel geometry)

**Evaluation data**

- World River Sediment Yield Database by FAO (873 rivers)
- M&F05 database by James Syvitski et al (2007, 488 rivers)

**Impact**

- MOSART-sediment lays the foundation for modeling transportation and transform of particulate C, N and P through rivers into the ocean to close the global C, N and P cycles
- Modeling and evaluating river BGC provide important constraints for simulating the soil C, N and P balance in ACME-CLM
- Building on MOSART-sediment, groundwater-river interaction in the hyporheic zone can be represented to improve modeling of surface water-groundwater interactions