

The breakout group for riverine processes in modeling P noted several key areas for model improvement and data collection but largely focused on sediments: a strong vector for P, influencing particulate and dissolved P forms alike. Sediment erosion and deposition processes were discussed at length, given the large capacity for sediments to transport attached P downstream. We currently have limited data and understanding on this topic over time and space, particularly due to the cost in sampling and analysis. Both suspended and benthic sediments need further analysis, although it was noted that a few sediment chemistry databases exist (e.g., the USGS National Geochemical Survey database). Relatedly, models and input data could improve on sediment transport regimes and thus the potential for stream reaches to attenuate or mobilize sediments: bed substrate characteristics (particle size distributions), shear stress, vegetation effects, stream power, sinuosity, and other geomorphological features. Indeed, sediment routing could explain some of the large mismatch between P budgets of small streams and larger catchments – data may need to be collected at finer scales to distinguish sediment-P delivery, storage, and mobilization in models. Some models do try to account for P exchange between benthic sediments and the water-column (e.g., SWAT); it is unclear what is currently done for the P exchange between suspended sediments and the water-column