

CROSS-CUTTING SCIENCE STUDIES

- To advance our understanding of the water and energy cycle

WEBS:

- Define and understand average values and temporal variability for processes and components of the water and energy cycles
- Identify systematic errors and uncertainty of various types of water and energy data (in situ, model, satellite, etc.)
- Identify the distribution of hydroclimate phenomena with particular attention to the tails and changes in the distribution
 - o Also relevant for extremes
- Actions:
 - Surface, atmospheric, and full-column budget profiles (including the boundary layer)
 - Identify and focus on hydroclimate “hotspots” where there are large component interactions in the water and energy cycles
 - Tibet
 - High-elevation regions
 - Identify additional variables and datasets that would aid in budget studies
 - e.g. Global Terrestrial Network for Hydrology
 - Collaborate with modeling groups to evaluate water and energy budget processes and schemes
 - Understand water and energy budgets during large-scale low-frequency climate events during the entire CEOP from 2001-2012
 - NAO, ENSO, PDO

Hydroclimate extremes:

- To advance our understanding of hydroclimate extremes, including their occurrence, characteristics, evolution, and interconnections for the purposes of prediction
 - o Drought, Floods, heat/cold waves
- Actions:
 - Keep updating inventory of hydroclimate extremes
 - Identify people in CEOP who are examining hydroclimate extremes as part of their activities
 - Determine similarities and differences in the processes that drive extreme events in different regions
 - Assess, understand, and improve predictive capabilities

Tracers:

- To be able to use isotopic tracers to explain dynamics of the water cycle
- Actions:

- Coordinate the various isotopic models to enhance the understanding phase changes in the water cycle
- Need access to additional global and regional datasets
 - e.g. work with GCOS, GTOS and IAEA

Aerosols:

- To understand the interactions of aerosols on hydroclimate