Flood Cross SESSION 1 | REPORT

Hydrologic Factors for Flood Generation

SEP 22, 2023 | Online
GEWEX
1ST Global Flood Crosscutting Project Workshop

Science Question	What physical and hydrological factors dominate flood generation mechanisms across scales? And how these might be different in the combined flood generation mechanisms across the coastal, urban, and rural settings? + How might flood generation processes change with climate change and other human activity?		
Priorities	**Process controls across scales:** **Flashy behaviour** of watersheds (area, human activity, soils, precip). Understanding floods and flood generation in **small watersheds / streams with human activity** (especially in drier regions). – Understanding processes and human impacts across scales. Very **rare (disastrous) floods** are often driven by different flood generation processes than more regular floods. **Specific regions** and their specific characteristics (*Karst*,: infiltr.; *Cold regions*: rain on snow, ice jams, glacial lake oupbursts, permafrost; *Coastal regions*) What periods will places undergo (**no monotonous change** but changing processes in periods)	**Observations:** Opportunity from **remote sensing** advances (precip., soil moisture, reservoirs). What can we see at what scales? **Precipitation extremes?** How much is due to rainfall characeristics versus hydrology. How well is **human activity** captured? Direct, indirect and legacy effects. Trying to **measure across scales** (SWOT, Cosmic Ray, …). We might have to learn from places where **transitions** have already happened. How does climate change processes and system properties (e.g. soils).	**Impact & potential impact:** We have **few observations of the more extreme floods** which are thus highly uncertain, but most influential. **Human impact** from floods (exposure, …) – system, stress test to understand potential areas of interest Where are **impact, causes and changing mechanisms** most related and relevant (e.g. cold regions) **How will societies respond** to changing patterns of floods? How will this change the system.
Existing Efforts	Stein et al. 2019 HP JJ Gourley (Lie et al., GRL, in review)	Ke Zhang (Liu et al., 2020, JoH; Chen et al., 2023, JoH)	Merz et al. 2021 Nature RE&E Kreibich et al. 2022 Nature (Hazard + Impact Data: https://essd.copernicus.org/articles/15/2009/2023/) Thorsten Wagener (Devitt et al. 2023, Nature Comms.)
Designated Advocates	Need somebody coastal Vincent Fortin (cold regions)		