Two Years of Interdisciplinary Research, Education, and Network-building through the Studies of Precipitation, Flooding, and Rainfall Extremes Across Disciplines (SPREAD) Workshops

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What were these workshops?

• Sponsored by an NSF CAREER award and inspired by WAS*IS and related efforts, the “Studies of Precipitation, Flooding, and Rainfall Extremes Across Disciplines” (SPREAD) workshops were held in June 2013 in Fort Collins, Colorado, and in July 2014 in Boulder.
• 27 graduate students from a wide variety of disciplinary backgrounds (meteorology, hydrology, psychology, economics, engineering, history, geography, science and technology studies, and more!), but all doing their graduate research on some aspect of precipitation or flooding

What did we do?

Heard from prominent speakers

Bill Hooke, AMS
Eve Grunnfest, NSF
Kely Mahoney, NOAA
Mike Chard, Boulder County Emergency Manager
Marshall Shepherd, UGA (remotely, along with UGA summer courses taught by John Knoel)

What did we study?

Development of a Flash Flood Severity Index (FFSI)

• A large sub-group of SPREAD participants (led by Amanda Schroeder) is working to develop an impacts-based index for flash flooding – similar scales exist for other hazards (tornadoes, hurricanes, etc.) but not for flash floods
• However, objectively classifying flash floods is very difficult, precisely because they are a combination of meteorological/hydrological/societal factors
• A working draft of such a scale is shown here; further development is ongoing including interviews with NWS forecasters

Why this kind of workshop?

• Floods are by nature an interdisciplinary problem! For example:
  • What happens in the atmosphere to get the rain to the ground? (meteorology)
  • What happens to the water once it hits the ground? (hydrology)
  • What impacts does the flooding have on people? (sociology, economics, emergency management, etc., etc.)
  • What impacts does the flooding have on ecosystems? (ecology, etc.)
  • How will floods change in the future? (climate, floodplain management, policy)
• But the scientists and practitioners who work in all of these areas speak different scientific and professional languages...

What was the purpose?

• To develop concrete research ideas that incorporate methods and data from multiple disciplines
• To develop a network of early-career researchers who are able to do innovative work not only in their disciplinary “home”, but with a broader perspective as well, and share ideas with one another
• Bringing the group together twice (in consecutive summers) was key to achieving both of these goals!

Flood return periods and the “100-year flood”

• A recurring topic of discussion: the use of return periods for rainfall and flooding
• The scientific, statistical, and historical background for return periods are complex and interesting
• Jared LeClerc (psychology PhD from U. Washington) designed an experiment to assess peoples’ interpretations of return periods

A sampling of other projects inspired by SPREAD

• Ben Miller (economics, UCSD): economic value of weather warning systems
Multi-disciplinary group examining weather events with multiple hazards (e.g., concurrent tornado and flash-flood threat, such as El Reno/OKC in 2013)

What did we learn?

• Feedback from student participants revealed that the workshops were “eye-opening”, that they provided new research ideas and perspectives, and a feeling of being “reinvigorated...about doing good science”
• However, several participants also highlighted the difficulty of integrating physical and social sciences, even in an open-minded and engaged group
• Discussions at the 2014 workshop also centered around career opportunities for “multi-lingual” researchers: several SPREAD participants had started new careers that take advantage of their broader perspective, but others reported difficulty in finding well-tailored career opportunities
• Thus, although SPREAD achieved its goals of developing an interdisciplinary network of early-career researchers and initiating new projects, and in my opinion carried forward the WAS*IS mission, many challenges still remain for integrated weather-society research!

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