

Purpose – Meeting is designed to explore UWIN approaches to addressing climate change and extreme flooding.

In addition to what is contained in Jim Smith's notes below, Andy Miller would like to emphasize the following points:

1. We agreed it would be worthwhile for people working in each UWIN geographic region to look for streamflow records in small urban watersheds - especially those that are highly impervious and already built-out, so that land-cover change is not an important factor (you can also do this with an older area using just the last 10-20 years of record) - and to use the same metrics to assess for possible trends over time. If there are trends, then we would want to see whether we can find evidence for trends in the frequency of extreme rainfall intensity. This is much easier to do in geographic regions where we have an extensive bias-corrected rainfall radar data set (e.g. HydroNEXRAD) unless there is a dense rain-gage network. We need to have a followup discussion about what protocols to use. Aditi Bhaskar is already in contact with colleagues outside of UWIN to see about pulling in hydrologic records from other locations that are not part of the UWIN network.
2. We will want to proceed with discussion about the implications of potentially changing probabilities. The notes include some information about this. I had a conversation yesterday with a couple of local managers in our state department of transportation and they let me know that they feel this discussion is critically important to have with people at all levels of management agencies because there is a broad lack of understanding of how to think about these issues and their potential effect on decisionmaking. Many are not aware of the basic point made by Brian Bledsoe in conversation when he said that FEMA FIRMs are basically obsolete the day they are published, not to mention that most people don't understand what they mean and what they don't tell you. Here is where a broad consensus within UWIN about what messages to deliver would be especially helpful.
3. The issue of vulnerability and social justice as it is affected by all of the above needs to be addressed. So we will need to engage with the social scientists in our group to get their input on how to connect what we are talking about with their current research agendas.

## **NOTES**

Alex Mahalov presented a summary of research on extreme rainfall and dust storms in the Southwestern US during the North American Monsoon. A central point is the joint occurrence of flooding and dust storms (with associated health impacts).

Coastal storm surge was raised as an important and clearer setting in which climate change affects urban regions. Even if storms aren't changing, sea level rise is already exerting large impacts on coastal urban settings, like Miami. Locations of "outfalls" in coastal/estuarine settings will compromise water management systems as sea level rises.

The challenges of detecting climate change signals in streamflow observations were pointed out by Aditi Bhaskar. It was agreed that developing a common set of assessments of nonstationarities in streamflow records for UWIN study regions would be useful.

Characterizing uncertainties in the water cycle associated with landscape variability was also discussed. Disseminating the best “land” datasets for UWIN study regions would also facilitate regional comparisons.

The interplay of hydrology and social sciences research was discussed in the context of climate change. The interplay is likely of more importance as changing climate disrupts urban water systems.

Insurance is an important element of flood hazard management in urban regions, especially if climate change markedly alters hazards.

Landslide risk is important in many urban settings, but beyond the scope of our project.

Green infrastructure is likely to be of most utility for more common floods. “Retreat from the river” approaches (buyouts, parks, etc.) are likely of more importance for extreme floods in many settings.