

THE LOUISIANA STATE UNIVERSITY CENTER FOR COASTAL RESILIENCY KICKOFF SYMPOSIUM

BY SCOTT C. HAGEN

The global challenge of coastal resiliency requires interdisciplinary research with stakeholder involvement to yield transdisciplinary results and provide effective tools, products, and outreach. Continued advancement of computational models with integration of precipitation, overland flow, river discharge, tides, wind-waves, and surge processes is essential. However, we must go further and develop a better understanding of the dynamic, interrelated processes of natural and human systems through advanced systems-based models to assess effects of climate change and relative sea level rise.

“The best laid plans of mice & men ...

The idea of holding a symposium on coastal resiliency was first discussed by Peter Goodwin and Scott Hagen at the 2015 World Congress of IAHR. In February of 2016 now IAHR President Goodwin agreed to attend an event at Louisiana State University (LSU) later that year. On April 27, 2016 the Louisiana Board of Regents authorized the LSU Center for Coastal Resiliency (CCR) and a kickoff symposium was set for August 16, 2016. A wealth of experience was assembled in rapid succession including keynote speakers (Peter Goodwin, Center for Ecohydraulics Research at the University of Idaho; Rick Luettich, U.S. Department of Homeland Security (DHS) Coastal Resilience Center at the University of North Carolina; James Syvitski (Jai), head of the Community Surface Dynamics Modeling System (CSDMS) at the University of Colorado; and Larry Weber, Iowa Institute of Hydraulic Research (IIHR) – Hydroscience & Engineering at the University of Iowa), a panel from U.S. federal agencies (John Haines, U.S. Geological Survey (USGS); David Kidwell, National Oceanic and Atmospheric Administration (NOAA) / National Centers for Coastal Ocean Science (NCCOS); Jane Smith, U.S. Army Corps of Engineers (USACE); Richard Yuretich, National Science Foundation (NSF); and Robert Twilley, Louisiana Sea Grant College Program), and a regional panel (Michael Ellis, Louisiana Coastal Protection and Restoration Authority; Charles Groat, The Water Institute of the Gulf; Sam Bentley, LSU Coastal Studies Institute; Jeff Carney, LSU Coastal Sustainability Studio; Scott Hagen, LSU CCR;

Nathaniel Plant, USGS St. Pete Lab; Suzanne Van Cooten, Lower Mississippi River Forecast Center; Clint Willson, LSU Center for River Studies; and Margaret Reams, LSU Department of Environmental Sciences). Flights and hotels were booked, auditorium reserved, flyers printed, etc. – the plans were laid.

... often go awry” – Robert Burns

The Louisiana Flood of 2016 hit southern Louisiana with the equivalent of a “1,000-year rain” over a two-day period ending at 7 a.m. on Saturday, August 13. Gov. John Bel Edwards stated that the cost of the floods were an estimated \$8.7 billion, becoming the second billion-dollar flood to affect Louisiana in 2016. In addition, more than 55,000 homes and 6,000 businesses were affected in some way by this catastrophic event¹.

Those that flew into the Baton Rouge and New Orleans airports on Sunday and Monday, August 14 and 15, to participate in the August 16 kickoff symposium witnessed the devastation from above as displayed in the accompanying aerial photograph. Interstate 10, which directly connects New Orleans with Baton Rouge and the LSU campus, was flooded and the visitors flying into New Orleans had to cross the Mississippi river and arrive in Baton Rouge from the west. Nonetheless, all of the non-local symposium participants arrived on time. However, with the safety of the staff and attendees foremost in mind, in the afternoon of August 15 the large auditorium event (with a maximum 200 attendees registered) was cancelled.



Scott C. Hagen joined Louisiana State University (LSU) in 2015 where he holds the Louisiana Sea Grant

Laborde Chair and serves as the director of the LSU Center for Coastal Resiliency. He has joint appointments in civil engineering and with the Center for Computation & Technology. Scott, his colleagues, and their students are conducting interdisciplinary research in direct collaboration with stakeholders to produce transdisciplinary results. Together they have shifted the paradigm for hydrodynamic and ecological assessments of sea level rise, developed new technologies, and are helping coastal planners and emergency managers along the Gulf of Mexico and east coast of the U.S.

Symposium transformed to workshop

In a matter of hours a meeting room was secured and the symposium was transformed into a workshop with all of the planned speakers (with the exception of three local leaders who attended directly to flood recovery duties) and 20 invited attendees.

In his keynote lecture Peter Goodwin remarked on the unfortunate timing of the flooding and the kickoff symposium, “It is never the wrong time to focus on resilience.” Dr. Goodwin



Figure 1. Aerial photo of flooded homes near Denham Springs, Louisiana (NOAA)

incorporated examples from the San Francisco Bay-Delta in California to illustrate lessons learned on communication strategies with regards to balancing water supply reliability and ecosystem restoration. His focus was on how our research can inform policy and management. He posed four challenges to the engineering and scientific community including: Managing expectations; Monitoring to unravel system complexity; Restoration in disturbed landscapes; and, Choice of appropriate scales for experimental research. Peter concluded his talk with a quote from Alastair Smith, "At times of change, the learners will be the ones who will inherit the world, while the knowers will be beautifully prepared for a world that no longer exists."

Rick Luettich addressed the aspects of coastal resilience associated with managing risk: Quantifying it; Communicating it; and, Developing policy to reduce risk as opposed to enabling it to grow. He posed that given the nascent state of coastal resilience knowledge the time is right for investment in related research centers. In the developed world Louisiana is ground zero for coastal resiliency.

"Deltas, sinking deltas, and coastal resilience" was presented by James (Jai) Syvitski. He began his talk with an overview of CSDMS and then carefully articulated his points with data and exquisite illustrations: "when you add 50

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million people to a delta (Nile), you limit channel avulsions to protect infrastructure and populations" and, "the sea is rising faster than the rate sediment could be deposited even if there were no dams."

Larry Weber reminded us that often times building coastal resilience begins in the upper basin. In the case of the Mississippi river deltaic system that beginning is thousands of river miles to the north. There he demonstrated how IIHR – Hydrosience & Engineering and the Iowa Flood Center are building resilience to flooding and transport of harmful nutrients at the source. Their approach branded as the Iowa Watershed Approach draws upon hydrologic assessment, watershed planning, real-time monitoring and detailed hydrologic models

to place conservation practices (e.g. farm ponds, wetlands, perennial vegetation, etc.) throughout the watershed to reduce surface runoff during intense rainfall and process nutrients at all times.

The kickoff event and the Louisiana Flood of 2016 reminded us of a critical need that is lacking, which we need to develop to be successful in assessment and evaluation of coastal resiliency. We are and will be challenged by both hydrologic and hydraulic phenomena at the coastal land margin. Our efforts need to include better understanding of both coastal processes and improved integration of precipitation, overland flow, river discharge, tides, wind-waves, and surge processes in our future models.

Many of the participants will reconvene at the 37th IAHR World Congress to be held from August 13-18, 2017 in Kuala Lumpur, Malaysia. They will be joined by Robert Nicholls of the University of Southampton who will headline a special session entitled "The path to resiliency in low gradient coastal regions for present and future conditions." We hope you will be with us then. ■

References

1. C. Dolce. "Louisiana's Historic August Flooding Cost More Than \$8 Billion, Officials Say." Internet: <https://weather.com/news/weather/news/historic-august-louisiana-flooding-billion-dollar-disaster>, Sep. 5, 2016 [Oct. 19, 2016].