

## Presentation Abstracts – Session 2

\*Presenters and their associations are highlighted.

- ❖ **Galen Newman, Ivan Rusyn, Garrett Sansom**

**Department of Landscape Architecture & Urban Planning, TAMU**

*Resilience through Regeneration: Enhancing Resiliency with Engagement-based Green Infrastructure Provisions*

Abstract:

Houston, TX has one of the highest numbers of flood-related fatalities in the past 50 years. Manchester, one of Houston's oldest and most socially vulnerable neighborhoods, is 93% Hispanic with 40% of its households making less than \$25,000 annually. The neighborhood is within a 1-mile radius of 21 facilities that report to the Toxic Release Inventory from the U.S. EPA. Manchester is also characterized by an abundance of vacant/abandoned parcels. As part of the TAMU Superfund Center's Community Engagement Core, this project uses a participatory process in cooperation with T.E.J.A.S. and Furr High School's 'Green Ambassadors' in Manchester to develop a master plan utilizing green infrastructure to regenerate vacant lots and enhance resilience. Landscape performance measures project that the master plan will increase permeable area increase by 15.4%, capture an 17.8% of runoff, increase green space by 7 times its current amount, and result in \$243,856 in annual benefits.

- ❖ **Victoria Chraibi, Sherilyn Fritz, Euan Reavie, Amy Kireta, Andy Bramburger, Meijun Cai, Lisa Estep, Terry Brown**

**Department of Biological Sciences, Tarleton State University**

*Paleolimnology: providing a more comprehensive assessment of resilience and the long-term hierarchy of environmental controls on aquatic ecosystems*

Abstract:

Environmental conditions fundamentally determine ecological resilience, which per Holling (1973) we define as an ecosystem's ability to maintain structure and function during disturbance. Paleolimnology, the study of the sediment records of freshwater ecosystems, helps to provide a more comprehensive assessment of ecosystem responses to various environmental and anthropogenic stressors. In particular, paleolimnology considers long-term trends which can be employed to develop more accurate and reliable models. Paleolimnological records from two ecosystems, Lake Superior and Yellowstone National Park, provide examples of how aquatic ecosystems have displayed either resilience or change to stressors on timescales of 200 to 15,000 years. Stressors of consideration include various anthropogenic activities as well as climate and watershed characteristics; the interplay among these stressors are conceptually linked via a hierarchy of environmental controls. Developing comprehensive geospatial and temporal models of aquatic systems may aid the implementation of successful adaptive management strategies.

- ❖ **Kyeong Park, Jiabi Du, Emily J. Summers**

**Department of Marine Sciences, TAMUG**

*Response of Galveston Bay to Hurricane Harvey: Observation and Modelling*

Abstract:

Based on data from various sources, we present the dramatic response of Galveston Bay to Hurricane Harvey, including long-lasting elevated water level, extraordinary strong along-channel velocity, sharp decreases in salinity with long recovery time, and huge river plumes on the shelf. A hydrodynamic model that reproduces the observed response of the bay very well is used to estimate the salinity recovery time (TR) as a measure of the system resiliency. The TR with a mean of ~2 months shows great spatial variability ranging from <10 days near the mouth to >3 months in the inner part. The spatial variation appears consistent with the changes in phytoplankton community and can be explained by different salt influx by exchange flow and tidal pumping. Numerical experiments reveal that the TR exhibits a non-linear relationship with the amount of stormwater input, with the rate of increase in TR decreasing with increasing stormwater.

❖ **Paula Lorente, Department of Landscape Architecture & Urban Planning, TAMU**

*Urban Flood Resilience: Modeling, Planning and Implementation*

Abstract:

This presentation outlines two recent projects in flood resilience research. The first project is about a new spatial analytical approach to predict insured property damages from floods. The approach includes methodological improvements to modeling urban floods, and uses land use planning and urban design measures not traditionally considered in determinations of flood risk areas. The second is a study on challenges that communities face for regulatory compliance with mitigation requirements of the National Flood Insurance Program (NFIP). Discussion panels with over 30 local officials in four different states provided insights about the operational, technical, physical and emotional challenges that communities and community officials face when trying to implement mitigation plans and substantial damage regulations.

❖ **Andrea Roberts, Department of Landscape Architecture & Urban Planning, TAMU**

*Curating Freedom: Co-Researching with Descendants of Texas' Historic Black Settlements*

Abstract:

In 1870, formerly enslaved Texans owned 2% of farmland in Texas, and by 1900, they would own more than 31%. On this the land, they founded hundreds of black settlements known as freedmen's towns or freedom colonies. But why are these 557+ settlements' stakeholders' seemingly invisible or nonexistent within mainstream planning and preservation discourse? This presentation illuminates gaps in scholarship, policy, and practice by explicating the ways the myth that freedmen/women created only two types of places after Emancipation—urban enclaves or sharecropper cabins-- undermines Black agency in planning processes. Special attention is paid to grassroots placemaking and preservation practices, which complicate these and other assumptions informing the ways in which universities conduct research in Black communities. This presentation begins with a basic overview of freedom colonies' rise and decline, followed by lessons learned from collaborative planning, building communities of practice, and crowdsourcing with descendants of these unique black geographies.