**Session 3 Changing Climate**

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| Faculty Presenter | Abstract Title | Abstract |
| Sachin Rustgi | Turning perennial cotton into an annual: Remobilizing end-of-season perennial reserves for increased yield | Despite several efforts, cotton yield is stagnant for the last two decades. Given the growing demand for natural fiber, novel strategies are needed to improve its productivity. In this study, to develop cotton genotypes close to annual growth habit and the ability to remobilize the end-of-season perennial reserves to sink tissues with an expected positive impact on yield, the cotton genotypes with high expression alleles of the floral induction and meristem identity genes were identified and used for gene stacking. The results obtained in this direction will be discussed. |
| Brook Russell | Developing Statistical Methodologies to Investigate Extremes in the Earth’s Climate System | In a recent work, we investigated the association between Gulf of Mexico (GoM) sea surface temperatures (SSTs) and precipitation extremes in the southern United States. We concluded that elevated GoM SSTs correspond with higher precipitation extremes in the western Gulf Coast region, and that future warming GoM SST scenarios could mean increasing extreme precipitation events in areas such as Houston, TX. In this talk, I will briefly overview this work, and also discuss other similar ongoing projects. |
| Whitney Huang | Estimating Concurrent Climate Extremes: A Conditional Approach | In many climate applications, not only the frequency but also the magnitude of concurrent extremes are of interest. One way to approach this problem is to study the distribution of one climate variable given that another is extreme. In this work we develop a statistical framework for estimating bivariate concurrent extremes via a conditional approach, where univariate extreme value modeling is combined with dependence modeling of the conditional tail distribution using techniques from quantile regression and extreme value analysis to quantify concurrent extremes. |
| Ming Yang | Single-Site Catalysis for Efficient Fuel Gas Processing and Clean Transportation | The exploration of cost-effective heterogeneous catalytic materials to produce sustainable energy and mitigate climate change is at the heart of both fundamental and industrial reaction engineering research. In order to allow such a large family of materials to match the elegant and promising chemistry of their corresponding homogeneous and molecular prototypes, perhaps the ultimate design goal for heterogeneous catalysts is to simultaneously maximize the dispersion of the supported catalytic metals and to display desired intrinsic chemistry per metal atom. For example, even when a catalytic nanoparticle has a tiny size of 3 nm, it is well accepted by the catalysis community that at least ~70 % of the catalytic metal atoms are not contributing to any given reactions. In this talk, I will summarize my research findings from the last a few years in this active field. |
| Puskar Khanal | How much is the South Carolina’s coastal ecosystem worth? | Coasts are the places with highest concentration of people, so impacts continue to increase as the value of coastal infrastructures continues to grow. Depleting capacity of marshes to provide protection services would make these communities more vulnerable during storm events such as hurricanes in the future. |