



TEXAS TECH UNIVERSITY

# Climate Science Center™

**May Newsletter 2016**

## **Hot Playgrounds and Children's Health**

Dr. Jennifer Vanos is an assistant professor in the atmospheric science group and is a faculty affiliate with the Climate Science Center at Texas Tech. In 2015, Dr. Vanos led a team of researchers that found dangerously hot playground temperatures. Vanos and her team studied two playgrounds in Gilbert, Arizona. The purpose of this study was to compare the thermal microenvironment of both playgrounds using remote sensing data and touch scale analysis. The remote sensing data allowed for surface temperature estimation of objects such as "roads, buildings, houses, backyards" etc. (Vanos et al., 2015). Touch-scale measurements were acquired from various meteorological instruments mounted to a golf cart and a hand held infrared thermometer. Touch-scale analysis allowed for surface temperature estimation of rails, benches, asphalt, cement, and other objects that children touch during activity at a playground.

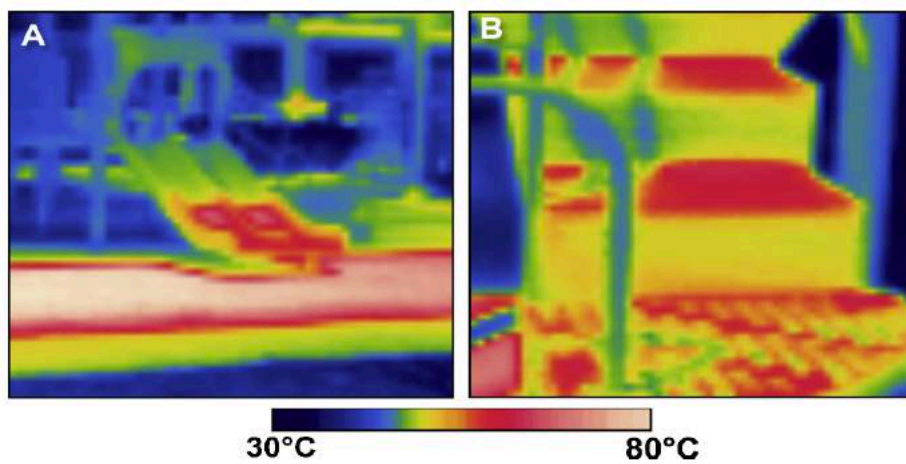
The results of this study suggest that using remote sensing data to measure surface temperatures is not as accurate as using data from touch-scale measurements. When measuring at a touch-scale, surface temperatures were found to be higher, potentially causing harm to the children interacting with certain equipment and surfaces at playgrounds. The remote sensing data recorded a range of surface temperatures between 32.8 to 60.7° C in the playgrounds. When measuring at the touch-scale, the surface temperature of "playground equipment sat on by children" ranged from 46.7 to 71.7°C. Temperatures greater than or equal to 60°C can burn a child in 3 seconds. Children have a higher surface-area-to-body which means heat effects are heightened in children and with slower reflexes they cannot perceive heat stress as accurately as an adult.

Dr. Vanos and her team of researchers believe that when studying urban design and climate, shade should be one of the most important aspects considered. When measuring at the touch-scale, surfaces and objects are found to approach or surpass "thresholds of burn temperatures to children", who are possibly the most vulnerable to heat stress. This research is important in regards to the guidelines set by the U.S. Consumer Product Safety Commission because they use data like Dr. Vanos's to suggest what materials should be used at playgrounds.

## **Ian Scott-Fleming**



Ian Scott-Fleming received his Bachelor of Arts degree in Economics at the College of William & Mary in 1977. He received his Masters of Science degree in Electrical Engineering from the University of Arizona in 1987. Before coming to Lubbock, TX Ian worked at the Multiple Mirror Telescope, where he worked on telescope guidance systems and modeled telescope systems to improve structural performance. When he came to Lubbock he worked at Texas Instruments working with software for statistical analysis. Ian started working as an adjunct professor for the Department of Electrical Engineering in 2000 and in 2011 he began climate modeling for the Climate Science Center (CSC). At the CSC, Ian provides software support (for graduate students and faculty who need help) and he works on climate downscaling to produce models to help people's



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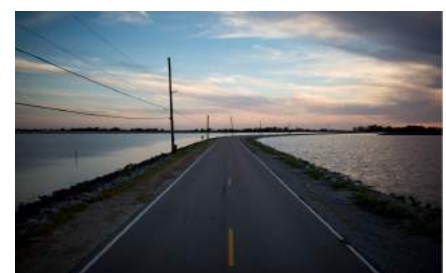
research in the CSC. He takes large-scale grid outputs and uses localized observations to remap the large-scale observations to better estimate future localized temperature and rainfall patterns.

## Upcoming Events

- The South Central - Climate Science Center interns will be coming to Texas Tech University June 5th to the 11th to learn about climate issues, such as water quality, soil temperatures, biometeorology on health, and human habitation. During the SC-CSC internship the students will visit Louisiana State University, Oklahoma University, and will finish at Texas Tech University.
- Our fourth Videos for Science has been released. [Click here](#) to watch the video featuring Kathryn Brautigam, who is a Ph.D. student in the Grisham Climate Response Lab looking at the winter ecology of the Sandhill crane population in the context of land and climate change at Muleshoe Wildlife Refuge. Stay tuned this summer, as we will continue to release Videos For Science videos on our [Facebook](#) and [Twitter](#) page.
- KTTZ has started production on the beginning episodes for the series, Global Weirder starring Katharine Hayhoe. Global Weirder will tackle the arguments of science, politics, religion, culture, and psychology at the intersection of politics and climate change. The series is set to release in the fall of 2016, stay tuned for more information.

### Resettling the First American 'Climate Refugees'

The first climate change refugees on the Isle de Jean Charles were granted \$48 million to relocate. A changing climate potentially comes with rising sea levels, strong storms, increased flooding, and intense droughts, which will cause the most vulnerable communities to relocate due to the lack of resources they have. The United Nations predict 50-200 million people could be displaced by 2050. It is not easy to move a community, the \$48 million given to Isle de Jean will only move 60 people and the plan is expected to face challenges. If we have a hard time moving 60 people how will we move millions of people? It's time to discuss the issue of climate change and prepare for adaptation plans.



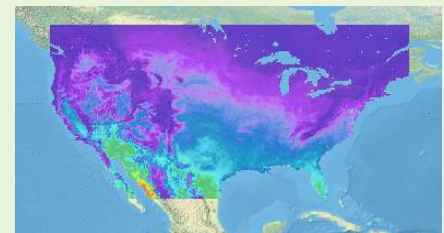
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## Other News

- Our undergraduate video has been released. [Click here](#) to watch 12 undergraduate students from Texas Tech give their opinion on climate change. You may be surprised by some of the answers that we received so check it out!
- The CSC is looking to fill an intern position that starts in August and ends in May. The internship will be 15 hours per week and is paid (\$8.00 per hour). If you know of anyone who would be interested in this position or is interested in science or the environment please send your resume to [breanna.allen@ttu.edu](mailto:breanna.allen@ttu.edu).
- We would like to recognize our CSC intern, Aaron Flores, he just was accepted as a graduate student here at Texas Tech University. He will be pursuing a Master's Degree in Geography in the Department of Geosciences and will be working as a teaching assistant. He plans to minor in Public Administration to help him focus on Environmental Policy as it pertains to climate change.

## CSC Featured Data Set

The high-resolution climate projections generated by the TTU CSC are now online as part of the USGS GeoData Portal. They can be used to make interactive climate maps of a host of variables (shown: days per year with maximum temperatures above 90F). <http://goo.gl/OF49Ep>



## May Seminar Panelists

Three expert panelists discussed their research of invasive species with regards to climate science. Dr. Barnes dived into a demonstration of how much air traffic there is around the world and we need to be aware that it allows plants, animals, and disease vectors to move around the globe to become invasive species. His research focuses on predicting biological invasions by using genetic tools and environmental DNA. Dr. Barnes concluded by going through the framework of the ecology of eDNA which is: origin, state, transport, and fate. Dr. Kahl's introduction focused on the brown tree snake that she studied in Guam. Dr. Kahl's second project focused on climate and habitat suitability for species. Her team is looking at routes and assessing them to tell which route would be best for that ecosystem and where along the roadway different types of planning are needed to accommodate species. Dr. Presley discussed the importance of public health with invasive species. Dr. Presley's team looks at the transmission dynamics in the environment, how things may be exposed, how they get it, and how they transport it. Dr. Presley concluded that we need to be aware of invasive species because we may not be able to control them.





(Featured: Matthew Barnes, Samantha Kahl, and Steve Presley)

