Session Abstracts

El Niño Southern Oscillation and Pasture Shift in the Moche Valley: La Libertad, Peru
Presented by Corey Hoover, Louisiana State University/Louisiana Division of Historic Preservation

Description: This work uses remotely sensed imagery processed through Google Earth Engine and Python as well as data from Sea Surface Temperature (SST) in several Niño regions (ONI, 3.4, 1+2) to explore pasture shift and anomalies in the Moche Valley in order to discuss possible camelid pasturing patterns in the ancient Andes. Camelid use and feeding techniques are discussed as well as networks associated with these processes.
Keywords: *Andes, Environmental Archaeology, Livestock, Camelids, Vegetation Indices, ENSO, El Niño, Pastures*

From Gameboard to Dashboard: Accelerating Climate Action with GIS
Presented by Teresa Townsend, Planning Communities

Description: Climate action planning requires months of analysis, stakeholder engagement, and evaluation of hundreds of potential strategies. This session presents a GIS-enabled approach that accelerates the process using Action to Zero, a collaborative climate action planning game developed by Planning Communities. We will compare the traditional planning workflow with a new interactive approach that integrates GIS before and after gameplay. On the front end, spatial data helps participants understand local conditions and evaluate climate actions that will have the greatest impact. During gameplay, teams prioritize from a curated set of globally vetted climate actions focused on goals such as greenhouse gas reduction, renewable energy, equity, and resilience. On the back end, selected actions are translated into spatial datasets and visualized through KPI tracking applications built in ArcGIS, enabling organizations to monitor climate outcomes and move more quickly from planning to implementation.
Keywords: *gamification, spatial analysis, decision-support, KPIs, climate actions, climate resilience, equity, collaboration*

Urban Development Implications on Land Surface Temperatures and Surface Urban Heat Islands in Nairobi City, Kenya
Presented by Sharon Onyango, Kenya Medical Research Institute

Description: Urban expansion in Nairobi, Kenya has progressively replaced vegetated surfaces with impervious cover, intensifying urban heat island (UHI) effects. This study examined spatiotemporal changes in land use/land cover (LULC) and their impact on land surface temperature (LST) and surface UHI using Landsat imagery from 1988, 2002, and 2018, with a projection to 2033. Supervised classification, NDVI estimation, and the mono-window algorithm were applied for LST retrieval. Results showed a mean LST increase of 4.15°C, a decline in peak NDVI by 0.38, and strong negative LST-NDVI correlations (r = -0.94 to -0.90). Eastern and central Nairobi emerged as persistent heat hotspots. Projections to 2033 indicate continued vegetation loss and intensifying surface temperatures, underscoring the urgent need for evidence-based urban greening strategies to support climate-resilient planning in tropical African cities.
Keywords: *Urban heat island (UHI), Land use/cover (LULC), Land surface temperature (LST), Surface urban heat islands SUHI)*

From maps to vision: nature-based solutions in Georgetown, South Carolina
Presented by Shu-Mei Huang, SC Sea Grant Consortium/College of Charleston

Description: The project aims to demonstrate how nature-based solutions (NBS) can be incorporated into urban planning and development/redevelopment to increase community resilience to flooding impacts in Georgetown County. The project team will propose sites based on flooding risk, feasibility, and visibility and temporal patterns, by ranking and comparing 7000 hexagons (~75.5 acre each) created among Georgetown County, SC. Community workshops will be hosted to share analysis results, ask for feedback and discuss partnerships on implementing designs. The team will select the designs that meet the most needs and goals for each site, and create a detailed plan for design visualization and cost estimation, along with a summary of regulatory requirements and coordination.

The project is expected to finish in 2027, it is led by North Inlet–Winyah Bay National Estuarine Research Reserve and University of South Carolina. Partners include College of Charleston, Robinson Design Engineers, and SC Sea Grant
Keywords: *Nature-based Solutions, Flood Resilience*