



NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM
COASTAL CAROLINAS
 DROUGHT EARLY WARNING SYSTEM

Developing a Hydroclimate Extremes Atlas for the Carolinas

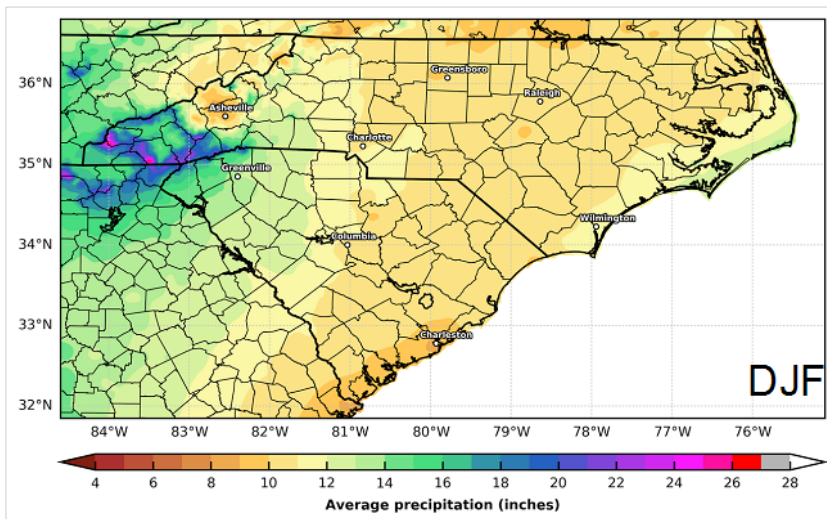
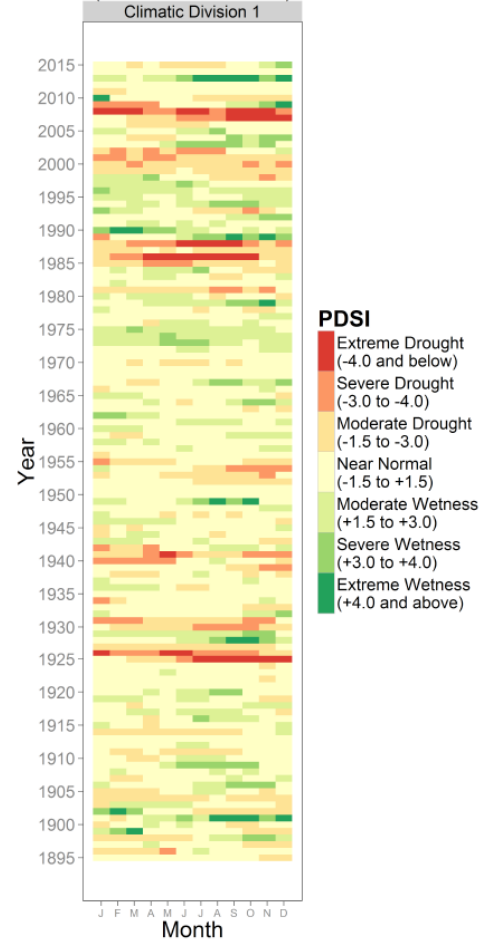
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The Carolinas Integrated Sciences and Assessments (CISA) team is creating a digital atlas of hydroclimate extremes in the Carolinas. The atlas will complement existing information sources on extreme precipitation (e.g. NOAA's Atlas 14) and drought (e.g., products from the National Drought Mitigation Center). It will include maps and figures characterizing various measures of precipitation, drought, and the water balance. Some of the drought indices are those used operationally by resource managers, others are new, or offer spatial or temporal resolution not readily available from other sources. The atlas will allow users to explore probability distributions and recurrence intervals for a large number of stations across the Carolinas by season. It will integrate station and regional products, and photographs, videos, and narratives of drought and heavy precipitation events.

Visual Display of Published Data

Some parts of the atlas will map or graph existing data sets. For example, NOAA's National Centers for Environmental Information and other sources contain raw precipitation data and a suite of indices at the climate division level. Seasonal and annual average precipitation values are mapped for the Carolinas, with precipitation statistics for 135 individual stations. The map below shows long-term average winter (Dec-Feb) rainfall. We have also created graphics to display time series for commonly-used drought indices since 1895. Among them, the Palmer Drought Severity Index (PDSI), the standardized precipitation index (SPI), and the Palmer Hydrological Drought Index (PHDI) are shown on this handout. The example to the right shows a heat map for the PSDI time series in North Carolina, Climate Division 1.

Palmer Drought Severity Index (NC Climate Division 1)



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MORE INFORMATION can be found at http://www.cisa.sc.edu/projects_nidis.html

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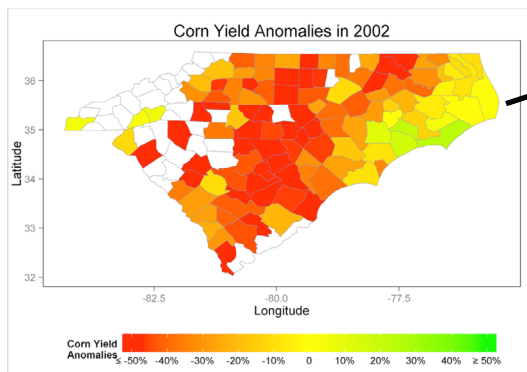
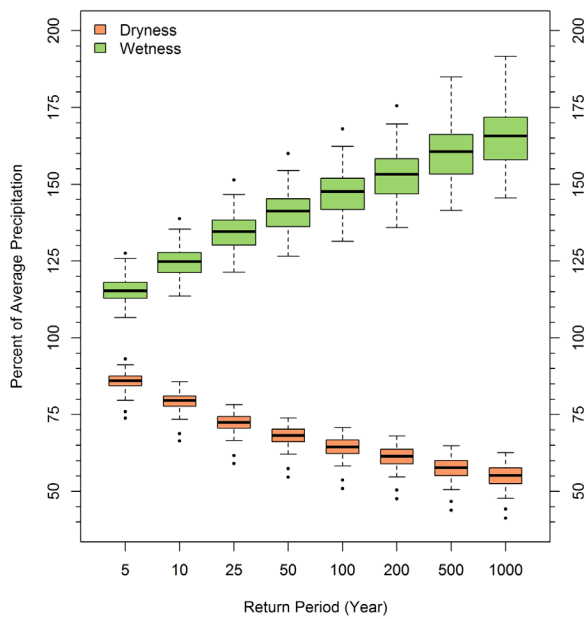
Calculation of Indices for Stations and Grids

To supplement published data, indices have been calculated at different spatial and temporal scales. For example, SPI time series have been created for 135 stations with records of at least 60 years. In addition, we have created SPI-1 to SPI-24 maps from the monthly, 4-km gridded PRISM precipitation data (1895-2015).

Recurrence Intervals

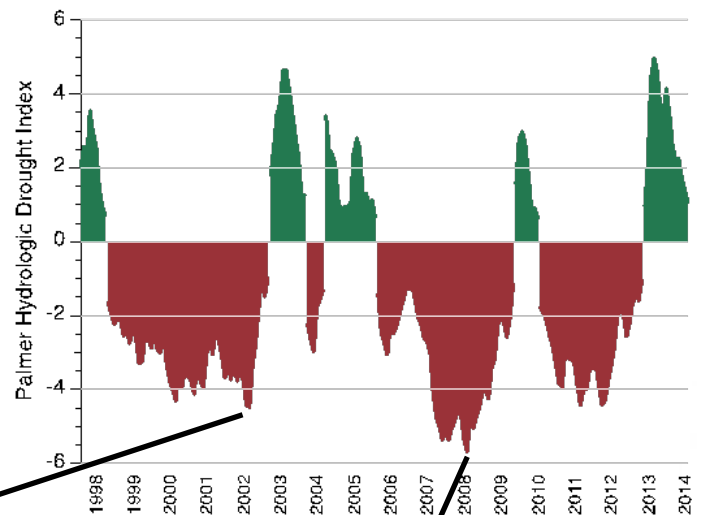
Maps and graphics will show the duration and frequency of wet and dry events at individual stations and the spread across all stations. As an example of the spread, this figure shows that in any given year, there is a 1 in 1000 (0.1%) chance that the previous 12-month precipitation total will be approximately 165% of the long-term average with higher and lower percentages at individual stations.

12-Month Precipitation Recurrence Interval



Impacts

The atlas will link graphics of hydroclimate anomalies with statistical measures of impacts. Below (left) are maps depicting a scaled drought index and consequent corn yield during the 2002 drought. The atlas will also use a series of photos, videos, and newspaper accounts to show various intense droughts and floods.



What is a Drought Early Warning System (DEWS)?

A NIDIS DEWS utilizes new and existing partner networks to optimize the expertise of a wide range of federal, tribal, state, local and academic partners in order to make climate and drought science readily available, easily understandable and usable for decision makers; and to improve the capacity of stakeholders to better monitor, forecast, plan for and cope with the impacts of drought.

What is the Coastal Carolinas DEWS?

A diverse group of stakeholders convened in August 2012 in Wilmington, NC, to identify issues of concern about drought in the coastal regions of the Carolinas. Out of the meeting came the Coastal Carolinas Drought Early Warning System, a collaborative federal, state, and local interagency effort to improve early warning capacity and resilience to drought. CC DEWS activities focus on improving the understanding of drought's effects on coastal environmental resources and developing information to enhance drought monitoring and planning processes.