



Trends

Cooperative Institute for Climate and Satellites—North Carolina
Inspire. Advance. Engage.

Winter 2014/2015

Who We Are

Hosted by North Carolina State University, CICS-NC is a unique center of excellence showcasing a partnership between universities, the private sector, non-profit organizations, community groups, and the federal government. CICS-NC is a multidisciplinary team of experts who collaborate in climate and satellite research to support NOAA NCDC's "research to operations" strategy.

Our Vision

- CICS-NC **inspires** cutting-edge research and collaboration.
- CICS-NC **advances** NOAA's mission to understand and communicate the current and future state of the climate.
- CICS-NC **engages** with business, industry, academia, and the public to enhance decision-making.

[more info](#)

Main Research Activities

[Climate Data Records and Scientific Data Stewardship](#)

[Surface Observing Networks](#)

[National Climate Assessment](#)

[Engagement, Outreach, and Literacy](#)

[Access and Services Development](#)

[Workforce Development](#)

[Consortium Projects](#)

Note from the Director

Welcome to the Winter 2014/2015 issue of the CICS-NC Newsletter. CICS-NC is part of a joint effort between North Carolina State University (CICS-NC) and the University of Maryland (CICS-MD), supported through a cooperative agreement with the National Oceanic and Atmospheric Administration (NOAA). We jointly provide mission-directed support for NOAA's centers in Asheville, NC, and College Park, MD.

Much has happened in the past year. CICS had its mid-term review and was authorized for an additional five years of support, a number of major milestones were achieved as noted in this issue, CICS has a number of new faces, and our NOAA partner is in the midst of a data center consolidation process. However, our activities continue to support the transition of research into operations. In particular, our work in satellite and surface observations and climate-quality datasets provides our nation with our best view of the changing physical environment, while our climate communications, literacy, outreach, engagement, and education efforts help us all better understand and use this information.

The choices for topics in this issue were difficult, as there are many ongoing projects – please visit the CICS-NC website (www.cicsnc.org) for more information. We hope you enjoy our newsletter and encourage you to send us your comments at info@cicsnc.org.



Otis Brown, CICS-NC Director

Climate Engagement, Outreach, and Literacy

CICS-NC continues to build its engagement capabilities through multi-dimensional interactions with business and industry, the scientific and academic communities, non-governmental partners, and the general public. In the past six months, engagement and outreach efforts focused on academia, local and regional stakeholders, and associations.

This fall, [Carl Schreck](#) worked with two NASA DEVELOP interns to study climate forcing and precipitation in the Southwest. He is now working with another group of DEVELOP interns on the use of outgoing longwave radiation data in the energy sector. [Jared Rennie](#), [Ronald Leeper](#), [Jim Biard](#), and [Scott Stevens](#) lectured and led discussions on climate data with Western North Carolina students at the K-12, undergraduate, and graduate levels. [Jessica Matthews](#) is collaborating with the Statistical and Applied Mathematical Sciences Institute.

Thanks to a collaboration with the Facebook Data Center in North Carolina, the North Carolina State Climate Office, Isothermal Community College (ICC), and NCDC, a new climate station was installed at ICC to capture observations for Rutherford County and help the college build a climate curriculum. Other collaborations with business and industry associations continue. For example, [Jenny Disson](#) and [Jesse Bell](#) are currently working with regional and national Air & Waste Management Associations. Watch our Facebook page for more engagement news and events.



Carl Schreck (right) with NASA DEVELOP interns Lance Watkins (left) and Shani Kent-Hall (middle)



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The International Surface Temperature Initiative

Assessing the state of the climate and how it is changing over time requires accurate, reliable data with widespread geographic coverage over long periods of time. Decision makers also require accessible, transparent information about the provenance of the data. The [International Surface Temperature Initiative](#) (ISTI) seeks to meet those needs by providing a more robust global temperature record.

CICS-NC's [Jared Rennie](#) was lead author on an [article in *Geoscience Data Journal*](#) describing the first outcome of the Initiative—a new merged monthly land surface temperature databank, which was released in June of 2014. Jared also described the dataset and methodology in a [guest post on *RealClimate.org*](#). Three years in the making and derived from more than 32,000 stations—some with data going back 300 years—the new databank provides an improved picture of how land surface temperatures have evolved over decades and centuries.

The databank is hosted by NCDC and is [freely available](#), along with the code used to generate the “Stage 3” merged product. Efforts are underway to continue expanding the number of data sources, provide products at higher time-resolutions, and to develop methods for benchmarking the data.

CICS-NC and the National Climate Assessment

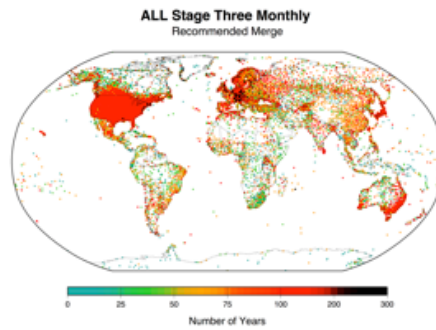
On May 6, 2014, the White House released the [Third U.S. National Climate Assessment \(NCA\)](#). The report represented four years of effort by more than 300 experts and set new standards for clarity, readability, and transparency.

Working as part of NOAA's Assessment Technical Support Unit (TSU) based at NCDC, CICS-NC staff and contractors played pivotal roles in the development and delivery of the report, providing much of the foundational climate science analysis, editorial and graphics support, software engineering, and data management expertise. CICS-NC staff also did the bulk of the development of the very accessible “[Highlights](#)” summary document and made major contributions to the design and build-out of the website.

CICS-NC continues to support the assessment process in a variety of ways, including responding to requests for additional information and by making the data sets used to generate many of the climate science figures available to the public via the [CICS website](#). CICS-NC and the rest of the TSU are already hard at work on the U.S. Global Change Research Program's [Climate and Health Assessment](#), which will be released in early 2016.

Cooperative Agreement Renewed

In July of 2014, the NOAA cooperative agreement supporting the CICS consortium was renewed for another five-year term. The new agreement ensures that the institute will continue to serve as a source of innovation and expertise at NCDC and as a catalyst for an expanding range of public and private climate- and weather-related activities in the Asheville area through 2019.



ISTI land surface temperature coverage map

CICS-NC at AGU and AMS

CICS-NC staff were well-represented at the major AGU and AMS meetings again this winter, contributing a total of 37 presentations, posters, and talks at the two meetings. Details are available on the CICS-NC website: [AGU Fall 2014](#) and [AMS 2015](#).

Big Data and High-Performance Computing

Investment in IT infrastructure and expertise continued this year, with the addition of a second high-performance computing cluster and more storage capacity. The CICS-NC IT team, led by [Jonathan Brannock](#) and [Scott Wilkins](#), also reconfigured many elements of the computing architecture, resulting in significant performance improvements. Together, these advances make it possible for CICS-NC and NCDC to analyze larger data sets than ever before and enable CICS-NC scientists, software engineers, and web developers to continue pushing boundaries.

[Scott Stevens](#) completed the multi-year task of reprocessing NEXRAD radar data for 2001–2011 using the NMQ/Q2 algorithm from NOAA's National Severe Storms Laboratory. The resulting high-resolution precipitation data set will be a valuable research tool, and lessons learned along the way generated improvements in IT processes and infrastructure. Scott also recently “parallelized” an algorithm for reprocessing High-resolution Infrared Radiation Sounder satellite data, shaving the compute time from several years to a few weeks.

[Andrew Buddenberg](#) is also making extensive use of parallel computing techniques for deriving analyses from climate model outputs for use in assessment activities.

[Jim Biard](#) and [Linda Copley](#) are exploring the power of “graph databases” for doing semantic and geographic queries of combined data sets. A proof-of-concept implementation combines VIIRS satellite images, a storm events database, and FIPS geographic data, allowing users to view VIIRS images corresponding to specific storm events.

[Anand Inamdar](#) is working with colleagues from NCDC to transition the International Satellite Cloud Climatology Project (ISCCP) from NASA's GISS center to NCDC, where CICS-NC's computing resources will be used with the rescued, reprocessed, and re-calibrated “B1” data to produce new, higher-resolution cloud data products.

