



NOAA NESDIS National Centers for Environmental Information (NCEI) Center

Services: End-User Access, Engagement, and Applications; Next Generation of Scientists, Engineers, and Data Managers; Provision of Subject Matter Expertise; Technical Support for Scientific Software; Science Centers Data Product Support

Timeline: April 2014 to Present

Location: Asheville, North Carolina

The NESDIS NCEI Center Support contract is a task order under NOAA's Scientific and Technical Support Services Next Generation (SciTech NG) contract and enables Global Science & Technology, Inc. (GST) to work across the NCEI organization. Prior to this contract, GST had been supporting the NOAA's Satellite Climate Data Records Program (CDRP) at the Center since September 2010. The CDRP work is now part of the SciTech NG contract. GST's approach to this task order is characterized by close collaboration with the customer, teamwork, and staff mentoring and training. GST's management approach focuses on anticipating NCEI's needs and identifying nationally recognized experts and placing those people within a matter of days.

Through this task order, GST is providing support in five main areas:

- **End-User Access, Engagement, and Applications** – In order to improve end-user access and ease of use for NCEI data and services, GST leads the ongoing collaborative cross-organization process within NCEI to develop a center-wide engagement strategy and implementation program. This extensive engagement enables NCEI to better understand its users and their needs. GST develops, executes, and updates an engagement implementation plan that includes a focus on identifying and then translating user requirements into improvements to NCEI products and services that are increasingly used and valued by a broad array of sectors and stakeholder groups. GST measures the effectiveness of the process through the development and use of a tracking and collaboration toolkit to monitor the progress, trends, and results of this engagement effort. These results feed the development of success stories and business cases that further justify the important work and investments being pursued across NCEI. The success stories are documented in nine in-depth case studies (Value of the Data - Success Stories) that examined user engagement with NCEI environmental data. The case studies demonstrated the value that the free and publicly available provision of NCEI's data has provided to key sectors utilizing this service, and also to society at large. Take a more in-depth look here: www.ncdc.noaa.gov/success.

CUSTOMER ENGAGEMENT POSTER PRESENTATION 2018 AMS



Annette Hollingshead with Najimah Jones at the 98th Annual American Meteorological Society (AMS) Conference in Austin, Texas

- **Provision of Subject Matter Expertise** – GST contributes subject matter expertise (SME) at NCEI in configuration management (CM) and scientific systems engineering. Our CM SME provides consulting, training, and integration support in all five areas of CM (Planning, Configuration Item Identification, Configuration Control, Status and Accounting, and Verification/Audits). The Scientific Systems Engineering SME develops, documents, and helps implement best practices at NCEI by defining processes, enabling reviews of products/processes/services, mentoring and training NCEI staff, and providing support to resolve scientific software engineering issues.

- **Next Generation of Scientists, Engineers, and Data Managers** – GST also leads several initiatives that focus on the next generation of scientists, engineers, and data managers through hands-on NOAA NASA DEVELOP internships. Since 2014, 50 interns have participated in this program developing 3 operational products for NCEI and its regional partners, completing 2 intensive vulnerability analyses for the United Nations, and producing 12 one-time analyses on a variety of topics from water resource availability to disaster response. In addition, two of GST’s team members – GST Chief Climatologist Dr. DeWayne Cecil and Senior Scientist Annette Hollingshead – are founders of Destination Space (Satellite Program for Aerospace-Centered Education) through the Asheville Museum of Science, a program designed to cultivate long-term interest in STEM disciplines.

DESTINATION SPACE – SATELLITE WEEK CAMP



Dr. DeWayne Cecil working with students to build their ground systems built during Destination Space - Satellite week

- **Technical Support for Scientific Software** – GST has been at the forefront of NCEI’s software evolution through its technical support for NCEI’s scientific software reengineering efforts. GST evaluates each reengineering candidate for NCEI staff. Upon candidate selection, GST executes the reengineering efforts using state-of-the-art programming languages and documentation within NCEI’s three-tiered IT architecture (development, testing, and production). We also design and capture quality assurance artifacts in order to duplicate results of the legacy code. These efforts improve automation and reliability and reduce cost and maintenance by developing easy-to-use and easy-to-maintain scripts. In one example, our refactoring of the Pairwise Homogeneity Algorithm (PHA) reduced the complexity of the code by 75%, cut the number of global variables from 108 to 4, and reduced the executable lines of code from 7,050 to 3,970, making the code far more maintainable and portable.
- **Science Centers Data Product Support** – GST supported the Climate Data Records (CDR) Program with climate data records dating back to their initial definition in 2010 and has played a central role in the development of CDRs at NCEI from its inception. GST provides CDR support in four core areas: program management, research-to-operations, operations and maintenance, and science and technology. GST’s efforts in these core areas were so successful that NCEI has adopted and expanded the CDR Program’s best practices throughout the Center. GST has also provided significant support to other NCEI processes in the technical areas of large data system management, access to cloud, and lifecycle maintenance and reengineering of scientific software.