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1. Introduction

The National Oceanic and Atmospheric Administration's (NOAA's) National Climatic Data Center (NCDC) recently expanded their customer service activities to include sectoral user engagement. As a starting point, NCDC identified 12 user sectors which represent a majority of the users requesting climate data and information from NCDC. These sectors include: Agriculture, Civil Infrastructure, Coastal Hazards, Energy, Health, Insurance, Litigation, Marine and Coastal Ecosystems, National Security, Transportation, Tourism, and Water Resources. Each sector has a team dedicated to learning more about and serving the needs of its users.

2. Activities

Activities within each sector include the development of sectoral fact sheets, hosting or co-hosting sectoral workshops, attending and/or participating at sectoral conferences, partnering on research activities, and representing NCDC at sectoral trade shows, just to name a few.

The following sections provide information on some user engagement activities that have recently occurred.

2.1 User Engagement Fact Sheets

User engagement fact sheets have been developed to serve as an introduction to each sector (Figure 1). These fact sheets provide an overview of the sector, key stakeholders, examples of sector needs, and NCDC data and products of particular interest to the sector. The fact sheets can be found on NCDC's user

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engagement website at <http://www.ncdc.noaa.gov/oa/userengagement/userengagement.html>.

2.2 User Workshops

Another way that NCDC is engaging users is by sponsoring or co-sponsoring user workshops. These workshops serve as an opportunity for climatologists and climate-sensitive users to sit at the same table to discuss the types of climate data and information that are needed and available, as well as to identify any gaps of information that may exist. This type of dialog continues to be important as we learn each other's terminology and discuss ever-changing needs.



Figure 1. The front page of the user engagement fact sheet for the Insurance sector.

In 2007, NCDC hosted its first workshop that focused on specific sectors of users; in this case energy, insurance, and transportation. In addition to highlighting the products and services that NCDC provides, the workshop gave an opportunity for NCDC to learn from users by way of user presentations and sector focused breakout discussions. This method of engaging the users proved to be quite successful and has led NCDC to host or co-host several additional workshops aimed at various sectors.

One such workshop titled *Climate, Weather, and Tourism in North Carolina: Issues and Opportunities* was co-sponsored by the Center for Sustainable Tourism at East Carolina University, North Carolina Sea Grant, and NCDC. Tourism is a major economic driver for North Carolina with \$17.1 Billion in travel expenditures, \$4.2 Billion in payroll, and employing 198,900 residents. Despite the fundamental influence climate and weather have on tourism services across the state, there is limited understanding of the relationship between these phenomena and day-to-day business operations and long-term economic and environmental sustainability. The workshop served as a springboard for collaboration between tourism groups, government agencies, and academia. More information about this workshop can be found at the on the workshop website at <http://www.ecu.edu/cs-acad/sustainabletourism/Climate-Weather-and-Tourism-Initiative.cfm>.

Another workshop, aimed at landscape architects, golf course architects, nurseries, and similar industries, was titled *Climate Change and the Plant Sector: A Growing Interest*. This workshop, co-sponsored by the Institute for Global Environmental Strategies, the North Carolina Arboretum, the University Corporation of Atmospheric Research, and NCDC, provided an important first step in building a critical information bridge between the climate science community and the numerous, diverse business sectors and public interests that rely on the health and well-being of plants. More information about this workshop can be found on the workshop website at <http://www.agrowinginterest.com/index.htm>.

International experts in global tropical cyclone best track data met at NCDC to discuss a variety of topics concerning the International

Best Track Archive for Climate Stewardship (IBTrACS). NCDC hosted the workshop for the World Meteorological Organization's (WMO) Regional Specialized Meteorological Centers Tropical Cyclone Programme. Attendees included ten international representatives from agencies and forecast centers worldwide, including federal and U.S. attendees. More information about this workshop can be found at the on the workshop website at <http://www.ncdc.noaa.gov/oa/ibtracs/index.php?name=workshop>.

NOAA and the International Trade Administration (ITA) partnered together to co-host two workshops aimed at the manufacturing sector. The first workshop, *Climate and Sustainability: U.S. Department of Commerce Services for the Business Community*, contained panel discussions from both agencies as well as a panel discussion with NOAA business customers who shared the importance and usefulness of NOAA data and services. Workshop presentations can be found at <http://web.ita.doc.gov/ete/eteinfo.nsf/0f8e6ea2534d7621852568d30003ba76/9450289a372725fa8525759f006586fc?OpenDocument>. Building on the success of this workshop, NCDC and ITA again partnered together to co-host a workshop titled *Water and Energy Conservation: U.S. Department of Commerce Services for Agribusiness*. This workshop was held in two locations in California with local and regional speakers who were knowledgeable and sensitive to the water issues in California.

A workshop titled *Climate Change and Human Health: Assessing the Climate Information Gap* was held to bring together a small number of experts from both the climate and health communities to discuss data needs related to a variety of climate-sensitive vector, water, and air borne diseases. This workshop was co-sponsored by the Centers for Disease Control and Prevention, the U.S. Environmental Protection Agency, the national Institute of Environmental Health Sciences, NCDC, and NOAA's Southeast Regional Climate Center. More information about this workshop can be found on the workshop website at http://www.sercc.com/climate_health.

2.3 Other Activities

In addition to the workshops co-hosted by NCDC, user engagement team members have engaged users in a variety of other ways. Over the past year, team members attended over 40 conferences and workshops. Participation at these events included giving presentations, serving as session chairs, and participating in various outreach activities. Each of these events provided NCDC the opportunity to inform users of the types of climate data and information that is available, learn about user needs and identify potential gaps, as well as develop partnerships for further collaboration.

3. Conclusion

NCDC has actively been interacting with users from a wide range of climate sensitive sectors to learn more about their data needs and any gaps that may exist. Developing fact sheets, organizing sectoral workshops, and presenting at sectoral conferences and workshops are just a few ways NCDC has engaged with users.