



## **North Olympic Peninsula Solutions Network**

### **How NASA Activities Benefit RC & D Members**

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**NOPSN REPORT  
08-01**

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- Clallam County
- Dungeness River Management Team
- Elwha Research Consortium
- Idaho National Laboratory
- National Aeronautical and Space Administration
- National Association of RC&D Councils
- National Resources Conservation Service
- National Water and Climate Center
- North Olympic Peninsula RC&D Council
- Olympic National Park
- Pacific Northwest National Laboratory
- Pacific Northwest Regional Collaboratory
- Peninsula College

# North Olympic Peninsula Solutions Network HOW NASA ACTIVITIES BENEFIT R C & D MEMBERS

## NOPSN Report 08-01

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### North Olympic Peninsula Solutions Network

Generating new ideas and engaging new users and potential partners of NASA Earth Science products (decision support tools, missions, and models) is a primary focus of the North Olympic Peninsula Solutions Network (NOPSN). We believe that working collaboratively with national, regional, state, and local networks will enable us to better understand current and emerging environmental issues and fully explore the best way to bring NASA tools and technologies to user groups. Please visit our website at <http://pcnasa.ctc.edu> to learn more.



### The Center of Excellence at Peninsula College

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# HOW NASA ACTIVITIES BENEFIT RC&D MEMBERS

The National Aeronautical and Space Administration's (NASA's) Earth Science Program is designed to help develop a better scientific understanding of the earth and how it responds to both human and environmentally induced changes. NASA utilizes satellites, aerial platforms and models to view the earth and its processes and to measure and predict changes. NASA's Applied Science Program harnesses large quantities of NASA data and information and provides it to various institutions and the public, thereby allowing us to better understand and manage these processes and changes. This program is currently focused on providing data and information in the six priority areas below.

## Agricultural Efficiency

NASA works with the U.S. Department of Agriculture (USDA) and the National Oceanic and Atmospheric Administration (NOAA) to better understand seasonal climate variability and to evaluate critical agricultural parameters such as crop production, water availability, solar radiation, and vegetation health over large areas. It also teams with the USDA's Foreign Agricultural Service and the National Agricultural Statistics Service to provide space-based data for modeling, monitoring and forecasting global and domestic agricultural production. In addition, many plant and animal diseases are related to climate and environmental conditions. For example, the establishment and/or migration of agricultural pests are often linked to climate variables, such as temperature and moisture, and environmental variables, such as the location of water bodies, the presence of vegetation and soil moisture. NASA satellite data and models can be utilized to evaluate the likely occurrence or migra-



tion of vectors such as ticks and mosquitoes, which can transport animal diseases, and wind, rain or other vectors which can transport plant pathogens.

## Water Management

NASA works with many agencies, including the U.S. Department of Interior's Bureau of Reclamation (BOR), the Environmental Protection Agency (EPA) and the USDA to determine where supplies of fresh water are located, to quantify how much water is available, and to figure out how fast water supplies are increasing or decreasing. Increased water use and climate changes threaten to deplete and/or modify the quality, quantity, timing and location of these precious water resources. Therefore, accurate information is needed to support decision-making that meets the needs of both humans and the environment. NASA satellite data can help to improve our understanding of evaporation, refine our ability to track changes in surface soil moisture, monitor aquifer water storage changes from space, and track water quality changes over time. Incorporating all of this information into decision support systems will lead to improved capability to predict water availability, protect water quality, and plan for water conservation.

## Public Health

NASA satellite data and models help predict and track conditions that may support and or cause the migration of diseases and disease vectors. Like agricultural diseases, many chronic and infectious human diseases (e.g. West Nile virus) are related to climate and environmental conditions. Vectors such as ticks and mosquitoes transport human pathogens. Variability in rainfall and temperature has a major influence on the distribution and quantity of both pests and diseases. In addition, high concentrations of atmospheric pollutants can worsen respiratory diseases such as asthma and emphysema. NASA's goal is to help determine how weather, climate, and other key environmental factors, such as vegetation, forests, flooding, wetlands, soil moisture, surface ultraviolet radiation, and surface temperatures correlate with the occurrence of chronic and infectious diseases.

## Disaster Management

NASA works collaboratively with the Federal Emergency Management Agency (FEMA), NOAA, the USDA, and the U.S. Geological Survey (USGS) to provide data to support FEMA decision support systems

that are utilized by planners, early warning systems and first responders. NASA data contribute to disaster forecasting, impact assessments, risk communication, disaster mitigation, and implementation of relief efforts related to wildfires, hurricanes and tornados, floods and other weather-related disasters.

## **Ecological Forecasting**

NASA utilizes satellite data and models to forecast the impact of environmental changes on local and regional ecosystems. These forecasts help us manage and preserve essential ecosystem services such as clean air, fresh water, fertile soils, waste removal, and biodiversity while building and maintaining our agricultural economies. Satellite imagery combined with other data in geographic information systems is used to generate visualization products for decision-makers. With this information, decision-makers can detect and evaluate such things as wild fires and major changes in land cover, track rainfall and weather patterns, and monitor coastal margins and coral reefs. NASA models help us understand the poorly understood connection between changes in land cover and climate variation.

## **Air Quality**

NASA is working with the EPA to help better fulfill its air quality management responsibilities and to make air quality forecasts. NASA utilizes atmospheric chemistry and dynamics models and satellite data to conduct air quality studies related to ozone mapping and transport, and pollutants like sulfur dioxide, particulate matter (aerosols), carbon monoxide, and methane. It is also utilizing satellite data to study the chemistry of our atmosphere, and key atmospheric constituents and how these constituents change over time.

Each of these areas has some relevance to agriculture and Resource Conservation and Development Councils in the United States. Which areas are most relevant to an individual or organization will depend on the specific location, activities, issues and needs of a particular individual or organization. However, it is NASA's desire to make its data and tools accessible to all individuals and organizations who can utilize them to better understand and manage their natural resources and protect the environment. Additional information on each of these and other NASA Applied Sciences priority areas can be found at: <http://science.hq.nasa.gov/earth-sun/applications/>

