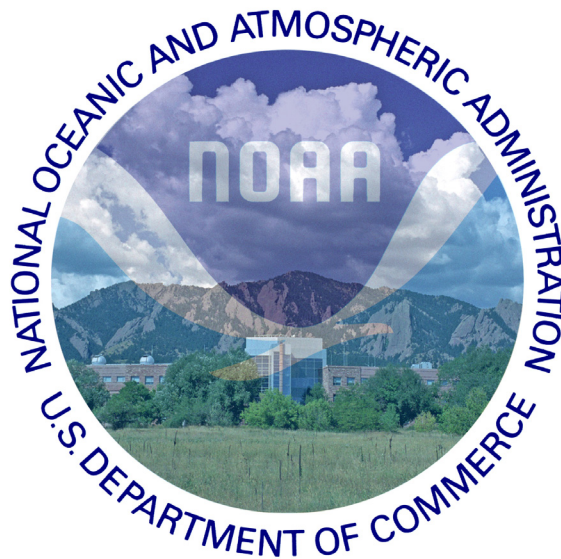


H. Collaborations



ESRL Physical Sciences Laboratory Review

David Skaggs Research Center
Boulder, Colorado
March 9-12, 2010

GSD Collaborations

Evidence of collaboration with other national and international research groups both inside and outside of NOAA as well as reimbursable support from non-NOAA sponsors

International Government Agencies

Australia Bureau of Meteorology
Bureau of Meteorology Research Centre, Melbourne, Victoria, Australia
Centre National d'Etudes Spatiales, France
Central Weather Bureau, Taiwan, Republic of China
Centro de Previsão de Tempo e Estudos Climáticos
Finnish Meteorological Institute
German Aerospace Center (DLR)
Korea Meteorological Administration, Republic of Korea
McGill University
Meteorological Service of Canada
Service d'Aéronomie–Institut Pierre-Simon Laplace, CNRS-UPMC-UVSQ, Paris, France
Shanghai Meteorological Bureau, Shanghai, People's Republic of China
Soil and Water Conservation Bureau, Taipei, Taiwan, Republic of China
Spanish Meteorological Association, Spain
State Oceanic Administration, National Marine Data and Information Service, Tianjin, People's Republic of China
United Kingdom Meteorological Office
University of Chile, Santiago de Chile
Water Resources Agency, Taipei, Taiwan Republic of China

International Private Companies

China National Huayun Technology Development Corporation, People's Republic of China
Heureka, The Finnish Science Centre
Højbygaard Paper Factory, Denmark
Korea Water Resources Corporation, Republic of Korea
Korean Broadcasting System, Republic of Korea
NAV Canada
Sigong Tech, Republic of Korea
Vaisala Corporation, Helsinki, Finland

International Non-Profit Organizations

American Institute in Taiwan

Bass Sea Solution, Holeby, Denmark

China Beijiko Meteorological Museum, Nanjing, People's Republic of China

Cite de l'espace, Toulouse, France

Gwacheon National Science Museum, Gwacheon, Republic of Korea

Huafeng Group, People's Republic of China

La Cité des Sciences et de l'industrie, France

Max Planck Institut, Mainz Germany

National Museum Of Natural Science, Taichung, Taiwan, Republic of China

Natural History Museum, Mexico City, Mexico

U.S. Government Organizations

Cooperative Institute for Meteorological Satellite Studies at the University of Wisconsin

Federal Aviation Administration

NASA Ames Research Center

NASA Goddard Space Flight Center

NASA Kennedy Space Center

NASA Langley Research Center

NASA Stennis Space Center

NASA Wallops Flight Facility

NASA Visitor Center, Wallops Island, VA

National Centers for Environmental Prediction

National Interagency Fire Center

National Renewable Energy Lab, Golden, CO

National Science Foundation

NOAA Air Resources Laboratory

NOAA Atlantic Oceanographic and Meteorological Laboratory

NOAA Center for Satellite Applications and Research

NOAA Geophysical Fluid Dynamics Laboratory

NOAA Great Lakes Environmental Laboratory

NOAA Office of the Chief Information Officer

NOAA National Climatic Data Center

NOAA National Geophysical Data Center

NOAA National Severe Storms Laboratory
NOAA National Weather Service
NOAA Pacific Marine Environmental Laboratory
Ted Stevens Marine Research Institute (NMFS), Juneau, AK
U.S. Astronaut Hall of Fame, Titusville, FL
U.S. Air Force Base Vandenberg
U.S. Air Force Research Laboratory
U.S. Air Force Space and Missile Command
U.S. Air Force Technical Applications Center
U.S. Air Force Weather Agency
U.S. Army Natick Soldier Center
U.S. Defense Technical Information Center
U.S. Department of Agriculture – Office of the Chief Information Officer
U.S. Department of Agriculture – Forest Service
U.S. Department of Energy – National Renewable Energy Laboratory
U.S. Department of Energy – Office of Human Capital Management
U.S. Department of Homeland Security – Federal Emergency Management Agency
U.S. Department of Homeland Security – Science and Technology Directorate
U.S. Department of the Interior – Bureau of Land Management
U.S. Environmental Protection Agency
U.S. Forest Service
U.S. National Geodetic Survey
U.S. Geological Survey
U.S. National Park Service
U.S. Weather Research Program

State Government Organizations

Alaska State Museum, Juneau, AK
California Department of Water Resources
Colorado State University
Iowa State University
Fiske Planetarium and Science Center of Colorado University, Boulder, CO
Florida State University
Imiloa, Astronomy Center of Hawaii, Hilo, HI

James Madison University, Harrisonburg, Virginia
Louisiana Spatial Reference Center, Louisiana State University
State of Colorado
New Mexico Institute of Mining and Technology
North Carolina State University
North Carolina A&T University
The Pennsylvania State University
University of Alaska Southeast
University of California, Berkeley
University of Colorado
University of Hawaii
University of North Dakota
University of Oklahoma
University of Wyoming

U.S. Private Companies

Atmospheric and Environmental Research, Inc.-
AvMet Corp
Black and White Color Prints, LLC
Boeing Corporation
Devon Energy Production Company, LP
ENSCO, Inc.
Global Imagination
Iberdrola Renewables, Inc.
ImagiCorps
ITT, Corp.
Lockheed Martin Corporation
Microsoft Visitor Center, Redmond, WA
Pelmorex, Inc.
Planning Systems, Inc.
Potomac Aviation Technology Corporation
Weather Decision Technologies, Inc. (WDT)

U.S Non-Profit Organizations

Bishop Museum, Honolulu, HI
Boonshoft Museum of Discovery, Dayton, OH
Castle Challenger Learning Center
Clark Planetarium, Salt Lake City, UT
Climate Institute
Denver Museum of Nature and Science
Discovery Science Center, Santa Ana, CA
Experience Learning Center
Great Lakes Maritime Heritage Center, Alpena, MI
Harsco Science Center, Harrisburg, PA
Houston Museum of Natural Science
International Museum of Art & Science
Lawrence Hall of Science, Berkeley, CA
McWane Science Center, Birmingham, AL
Massachusetts Institute of Technology/Lincoln Laboratories
Mitre Corp.
(Mitretek) Systems, now Noblis
National Center for Atmospheric Research (NCAR)
National Museum of Surveying, Springfield, IL
National Zoo, Washington, D.C.
Nauticus - The National Maritime Center, Norfolk, VA
North Carolina Aquarium, Manteo, NC
Ocean Explorium, New Bedford, MA
Oregon Museum of Science and Industry, Portland, OR
Orlando Science Center, Orlando, Florida
Science Museum of Minnesota
Smithsonian Institution
The Maryland Science Center, Baltimore, MD
The Museum of Science and Industry, Chicago, IL
The Science Fiction Museum, Seattle, WA
The Science Museum of Minnesota, St. Paul, MN
The Tech Museum of Innovation, San Jose, CA

The Wildlife Experience

University Corporation for Atmospheric Research (UCAR)

Science On a Sphere® Installations

Listed chronologically in order of installation

The Science Fiction Museum, Seattle, WA

Nauticus - The National Maritime Center, Norfolk, VA

The Science Museum of Minnesota, St. Paul, MN

Bishop Museum, Honolulu, HI

The Tech Museum of Innovation, San Jose, CA

The Maryland Science Center, Baltimore, MD

NASA Goddard Space Flight Center, Visitors Center, Greenbelt, MD

Great Lakes Maritime Heritage Center, Alpena, MI

Imiloa, Astronomy Center of Hawaii, Hilo, HI

James Madison University, Harrisonburg, VA

McWane Science Center, Birmingham, AL

Fiske Planetarium and Science Center of Colorado University, Boulder, CO

Orlando Science Center, Orlando, Florida

The Museum of Science and Industry, Chicago, IL

NOAA's National Severe Storms Laboratory, Norman, OK

Ocean Explorium, New Bedford, MA

Clark Planetarium, Salt Lake City, UT

Lawrence Hall of Science, Berkeley, CA

National Museum Of Natural Science, Taichung, Taiwan, Republic of China

Gwacheon National Science Museum, Gwacheon, Republic of Korea

National Renewable Energy Lab, Golden, CO

Smithsonian National Museum of Natural History, Washington, D.C.

International Museum of Art & Science, McAllen, TX

Microsoft Visitor Center, Redmond, WA

Ted Stevens Marine Research Institute (NMFS), Juneau, AK

NASA Visitor Center, Wallops Island, VA

National Museum of Surveying, Springfield, IL

Boonshoft Museum of Discovery, Dayton, OH

Climate Institute, Puebla, Mexico
Harsco Science Center, Harrisburg, PA
North Carolina Aquarium, Manteo, NC
National Zoo, Washington, D.C.
Alaska State Museum, Juneau, AK
Stennis Space Center, MS
The Wildlife Experience, Parker, CO
Cite des Sciences et de l'Industrie, Paris, France
Oregon Museum of Science and Industry, Portland, OR
Heureka, The Finnish Science Centre, Vantaa, Finland
Houston Museum of Natural Science, Houston, TX
Discovery Science Center, Santa Ana, CA
Castle Challenger Learning Center, Atwater, CA
Natural History Museum, Mexico City, Mexico
US Astronaut Hall of Fame, Titusville, FL
China Beijiko Meteorological Museum, Nanjing, People's Republic of China
Cite de l'espace, Toulouse, France

PSD Collaborations

Evidence of collaboration with other national and international research groups both inside and outside of NOAA as well as reimbursable support from non-NOAA sponsors

Virtually all efforts within PSD are collaborative in nature. PSD NOAA partners include other ESRL divisions, other OAR laboratories and programs, and other NOAA Line Offices. PSD non-NOAA collaborators include individuals and groups associated with local, regional, and national organizations spanning the public, academic and private sectors, as well as international organizations and programs. It would be very difficult to capture all collaborations here. A representative sampling from a few larger PSD efforts and various individual researchers is presented. Details are available upon request.

International Collaborators

All-Union Hydrometeorological Information Research Institute – World Data Center
Atmospheric Circulation Reconstructions over the Earth
Australian Bureau of Meteorology
Australian Commonwealth Scientific and Research Organization
Austria Central Institute for Meteorology and Geodynamics
British Antarctic Survey
Canadian Meteorological Centre
Canadian Network for the Detection Atmospheric Change
Chinese Academy of Sciences Institute of Atmospheric Physics
Danish Meteorological Institute
Deutscher Wetterdienst
EADS Astrium
École Polytechnique Fédérale de Lausanne
Environment Canada
European Centre for Medium-Range Weather Forecasts
Finnish Meteorological Institute
Global Climate Observing System
Global Ocean Ecosystem Dynamics Program
Hong Kong Observatory
Hydrologic Ensemble Prediction Experiment
HydroMeteorological Service of the Emilia-Romagna Regional Agency for Environmental Protection
Instituto Geofísico da Universidade do Porto
Inter-American Institute for Global Change Research
International Comprehensive Ocean-Atmosphere Data Set

International Environmental Data Rescue Organization
International Polar Year
Japanese Agency for Marine-Earth Science and Technology
Max-Planck Institute for Chemistry
Météo France
Norwegian Meteorological Institute
Portuguese Meteorological Institute
Proudman Oceanographic Laboratory
Royal Meteorological Institute of Belgium
Royal Netherlands Meteorological Institute
South African Weather Service
Sustained Arctic Observing Network
Russian Arctic and Antarctic Research Institute
Russian Federation Service for Hydrometeorology and Environmental Monitoring
Swedish Polar Research Secretariat
The Observing System Research and Predictability Experiment
United Kingdom Met Office
Universitat Rovira i Virgili
University of East Anglia
University of Cambridge
University of Heidelberg
University of Ireland
University of Leeds
University of Lisbon
University of Milan
University of New South Wales
University of Oxford
University of Stockholm
Vaisala, Inc.

National Collaborators

Inter- and Other-Agency

Brookhaven National Laboratory
Federal Climate Change and Water Working Group
NASA Dryden Flight Research Center
NASA Goddard Institute for Space Studies

NASA Goddard Space Flight Center
NASA Jet Propulsion Laboratory
NASA Langley Research Center
National Integrated Drought Information System
National Science Foundation Arctic Observing Network
Naval Research Laboratory
Office of Naval Research
Study of Environmental Arctic Change
U.S. Air Force
U.S. Army
U.S. Army Corps of Engineers
U.S. Bureau of Reclamation
U.S. Climate Variability and Predictability Research Program
U.S. Department of Agriculture
U.S. Department of Energy/Atmospheric Radiation Measurement Program
U.S. Department of the Interior/U.S. Geological Survey
U.S. Fish and Wildlife Service
U.S. Forest Service
U.S. Navy
U.S. Weather Research Program

Other

California Air Resources Board
California Applications Program
California Department of Water Resources
California Energy Commission
Climate Assessment for the Southwest
Climate Impacts Group
Colorado Climate Center/State Climatologist's Office
Colorado Water Conservation Board
Denver Water
Desert Research Institute
Exploratorium
FIRST RF Corporation
Institute of Arctic and Alpine Research
National Center for Atmospheric Research
North Carolina's Renaissance Computing Institute

Northwest Research Associates
Sacramento Area Flood Control Administration
Scripps Institution of Oceanography
Sonoma County Water Agency
Southern Nevada Water Authority
State of Jersey Meteorological Department
Surrey Satellite Technology Limited
Texas Commission on Environmental Quality
Western Governors' Association
Western States Federal Agency Support Team
Western Water Assessment
Woods Hole Oceanographic Institute
Wyoming State Climate Office

NOAA

NESDIS Center for Satellite Applications and Research
NESDIS National Climatic Data Center
NMFS (Northeast, Northwest, and Southwest Fisheries Science Centers)
NOAA Aircraft Operations Center
NOAA Climate Program Office
NOAA Climate Test Bed
NOAA Coastal Services Center
NOAA Hydrometeorology Testbed
NOAA Joint Radar Planning Team
NOAA National Climatic Data Center
NOAA Office of Climate Observation
NOAA Regional Climate Centers (High Plains, Midwest, Western)
NOAA Sea Grant
NOAA Southeast and Caribbean Regional Collaboration Team
NOAA West: NOAA Western Region Collaboration
NWS National Centers for Environmental Prediction (Climate Prediction Center, Environmental Modeling Center, Hydrologic Prediction Center, Tropical Prediction Center)
NWS National Operational Hydrologic Remote Sensing Center
NWS Office of Climate Weather and Water Services
NWS Office of Hydrologic Development
NWS Office of Science and Technology
NWS Regional Headquarters (Eastern Region, Southern Region, Western Region)

NWS River Forecast Centers (California-Nevada, Colorado Basin, Northwest, Southeast)
NWS Weather Forecast Offices in California, Maine, Massachusetts, Nevada, North Carolina,
Oregon, Pennsylvania, Texas, Washington
OAR Air Resources Laboratory
OAR Atlantic Oceanographic and Meteorological Laboratory
OAR Earth System Research Laboratory
OAR Geophysical Fluid Dynamics Laboratory
OAR National Severe Storms Laboratory
OAR Pacific Marine Environmental Laboratory

Universities

Colorado Sate University
Columbia University
Consortium of Universities for the Advancement of Hydrologic Science Incorporated
Cornell University
Duke University
Florida State University
Massachusetts Institute of Technology
Michigan Technological University
North Carolina State University
Oregon State University
Purdue University
University of Arizona
University of California Los Angeles
University of California San Diego
University of Colorado
University of Connecticut
University of Hawaii
University of Illinois
University of Massachusetts
University of Miami
University of New Hampshire
University of North Carolina
University of Oklahoma
University of Rhode Island
University of Washington
University of Wyoming

Cooperative Institutes

PSD, and ESRL as a whole, has a very longstanding collaborative relationship with the University of Colorado Cooperative Institute for Research in Environmental Sciences (CIRES). The CIRES mission statement reads:

CIRES researchers explore all aspects of the earth system and search for ways to better understand how natural and human-made disturbances impact our dynamic planet. Our focus on innovation and collaboration has made us a world leader in interdisciplinary research and teaching. We're committed to communicating our research in ways that help inform decision-makers and the public about how we can best ensure a sustainable future environment.

One-third of PSD's staff is made up of CIRES affiliates. Three PSD senior scientists (the PSD Director, Deputy Director for Research, and Weather and Climate Physics Branch Lead) serve on the CIRES Council of Fellows and help with CIRES strategic planning and management. A PSD CIRES Affiliate serves as the Director of the CIRES Climate Diagnostic Center. The PSD Deputy Director for Research serves as the Director of the Weather and Climate Dynamics division. PSD federal staff, CIRES affiliates, and contractors work hand-in-hand to advance the understanding of weather and climate processes.

Reimbursable Support

PSD's reimbursable non-NOAA funding of \$3.3M comprised approximately 17% of PSD's \$19.3M FY09 operating budget. A breakdown of primary sponsors is listed below. Details are available upon request.

NASA

U.S. Department of Defence/Air Force

U.S. Department of Defense/Army

U.S. Department of Defense/Navy

U.S. Department of Defense/Office of Naval Research

U.S. Department of Homeland Security

U.S. Department of the Interior/National Park Service

U.S. Department of the Interior/U.S. Geological Survey

Vaisala