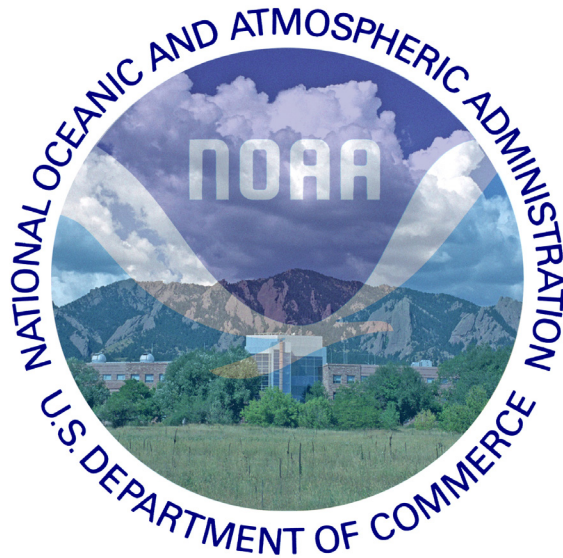


# Field Projects



**ESRL Physical Sciences Division  
Science Review  
May 12-14, 2015**

# PSD Field Programs

Field Program	Sponsoring Agency/Org	Scope	Description/Goal	PSD Role	PSD Principal Investigator(s)	Dates
Acoustic Tomography of the Atmosphere	ARO	Local	Build and operate the array of acoustic tomography of the ASL	Build and operate the array of acoustic tomography of the ASL	Ostashev, Wolfe	2010-present
ACSE (Arctic Clouds in Summer Experiment)	Stockholm University	International	Investigate clouds, atmospheric structure, surface energy budget, and related processes in variable sea-ice conditions of the Arctic Ocean	Contributed cloud radar, microwave radiometer, ceilometer, wind profiler, and other measurements. Engaged in process-based research.	Persson	2014
BAO (Boulder Atmospheric Observatory)	Various	Local, Regional	The Boulder Atmospheric Observatory (BAO) sits on 100 acres of land on the eastern plains of Colorado near the town of Erie. Its centerpiece is a 300m instrumented meteorological tower. The BAO has played a key part in numerous boundary layer studies and supports long-term climate baseline measurements. Associated studies have been reported in over 200 scientific publications and have included partnerships with local, state, and federal agencies, as well as university and commercial organizations.	Technical site support and program/project coordination for ground- and aircraft-base in-situ and remote sensor measurements.	Wolfe	Ongoing
CALNEX 2010	NOAA	National	Investigation of air pollution in the LA basin, the coast of California, and the Sacramento basin	Air-sea Flux and W-band radar cloud observations on the R/V Atlantis II	Fairall	2010
CalWater 2014	NOAA	National	Investigation of Atmospheric Rivers with NOAA G-IV aircraft	PI on the G-IV	Spackman, Fairall, White	2014
CalWater 2015	NOAA, DOE, NASA, NSF, ONR	Regional (West Coast US)	Aircraft-, ship-, and ground-based study of atmospheric rivers and the role of aerosols in cloud and precipitation processes	PSD scientists provided leadership roles as platform scientists, mission scientists, and forecast team members	Spackman, Fairall, White, Intrieri, Darby Gaggini, Wolfe Creamean	2015
CAMPS (Colorado Airborne Multi-Phase Study)	NSF	Regional	Investigate mixed-phase clouds and precipitation in an orographically forced region (Colorado).	Coordinate aircraft operations with a collaborative ground-based field project, oversee aircraft data analysis towards understanding spatial cloud structure and processes.	Shupe	2010-2011
COALA (Coordinated Observations of the Lower Arctic Atmosphere)	DOE	Local	Unmanned aircraft measurements of lower atmospheric thermodynamic state during sea ice freeze up	Operation and supply of unmanned aircraft, data preparation	de Boer	2014

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Denver-Julesburg Basin Air Quality Study	EDF, NOAA, NSF	Regional	To observe and characterize methane and non-methane hydrocarbon emissions from oil and natural gas operations in the Colorado Denver-Julesburg Basin	PSD deployed a network of wind profilers/RASS and surface meteorology sensors along the Colorado front range to support this major study led by NOAA/GMD during the spring/summer of 2012	White	2012
DYNAMO (Dynamics of the Madden-Julian Oscillation)	NOAA ONR NASA	International	Investigation of Madden-Julian Oscillation (MJO) in the Indian Ocean	FLux, sonde, and W-band radar measurements on R/V Revelle; flux observations from NOAA P-3	Fairall	2011-2012
FRAPPE (Front Range Air Pollution and Photochemistry Experiment)  DISCOVER/AQ (Deriving Information on Surface conditions from Column and Vertically Resolved Observations Relevant to Air Quality)	Colorado Department of Public Health, University of Colorado, Colorado State University, UC Berkeley, NASA, NOAA, NCAR	Regional	Characterize the local to regional chemical environment including photochemistry, oxidant and aerosol formation and fate, flow and recirculation patterns and large-scale inflow  Provide cal/val data for Earth-observing satellites measuring air quality to help them distinguish between pollution high in the atmosphere and that near the surface where people live and breathe	PSD deployed a network of wind profilers/RASS and surface meteorology sensors along the Colorado front range to support these two major aircraft-based air chemistry field campaigns during the summer and early fall of 2014.	White	2014
HIWINGS (High Wind Gas Exchange Study)	NSF, NOAA	National	Investigation of air-sea trace gas fluxes in high wind speeds	Air-sea Flux and wave observations on the R/V Knorr	Fairall	2013
HMT (NOAA Hydrometeorology Testbed)	NOAA, CA-DWR, NASA	National	Observation-based process understanding and modeling research on high-impact regional precipitation, weather and land surface conditions. The applied research fosters transition of scientific advances and new tools into forecasting operations to better balance water resource demands and flood mitigation strategies in a changing climate.	HMT was managed by PSD. It is currently implemented at both PSD and NOAA's Weather Prediction Center. The observation-based process understanding research employs a variety of field instruments, including wind profiler, precipitation, and snow level radars, surface met, soil moisture and GPS-met.	White, Cifelli, Mahoney	Ongoing
HS3 (Hurricane and Severe Storm Sentinel)	NASA, NOAA	National	HS3 is a five-year mission specifically targeted to investigate the processes that underlie hurricane formation and intensity change in the Atlantic Ocean basin.	Operational, technical & engineering support of dropsonde syst. for Global Hawk. Real-time data provision to NWS & NHC.	Wick, Spackman, Jackson, Costa	2010-2014

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IASOA (Intl Arctic Systems for Observing the Atmosphere)	DOE, NSF, CANDAC, NOAA, Environment Canada, NILU, WMO, WCRP, ICSU, IOC	Regional, (Arctic)	To advance coordinated and collaborative research objectives from independent pan-Arctic atmospheric observatories through strategically developing comprehensive observational capacity, facilitating data access and usability through a single gateway, and mobilizing contributions to synergistic science and socially-relevant services derived from IASOA assets and expertise ( <a href="http://www.esrl.noaa.gov/psd/iasoa/home2">http://www.esrl.noaa.gov/psd/iasoa/home2</a> )	Program coordination, instrument deployments, Arctic measurements (air-sea-ice flux, boundary layer dynamics, clouds)	Starkweather, Uttal	Ongoing
ICECAPS (Integrated Characterization of Energy, Clouds, Atmospheric state, and Precipitation at Summit)	NSF DOE NOAA	International	Investigating the atmospheric state, clouds, and precipitation over the Greenland Ice Sheet and their influences on mass accumulation and surface energy budgets	Radar, lidar, precipitation, and radiosonde measurements. Process research.	Shupe	2010-present
Integrated Study of San Juan Basin Methane Emissions	NOAA	Regional (4-Corners)	Instrumented aircraft, mobile laboratory vehicle, and ground-based observations investigation of the source of a recently published US methane anomaly viewed from space.	PSD deployed wind profilers and Radio Acoustic Sounding Systems (RASS) to better constrain boundary layer winds, vertical temperature profiles, boundary layer thickness)	White	2015
MC3E (Midlatitude Continental Convective Clouds Experiment)	DOE, NASA	National	Observed convective cloud lifecycle to help parameterize precipitation processes in weather models and improve satellite rainfall estimates	Deploy and operate 449-MHz and S-band vertically pointing Doppler radars; analyze collected datasets.	Williams	2011
RV Mirai Arctic Mission 2014	JAMSTEC, NOAA	International	Obtain surface fluxes in open waters of Beaufort/Chukchi Seas during autumn	Provided surface flux instrumentation, including sonic anemometers and radiometers. Mounted them on the bow of the Japanese ship Mirai. Had CIRES/PSD staff maintain equipment during 6 week cruise.	Fairall	2014
San Juan Mountain Seed Study	UM, NASA	Local	Investigate impacts of dust aerosols on cloud and snow formation in the San Juan Mountains of Colorado	Collect aerosol and snow samples	Creamean	2015

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Sea State	ONR	National	Improve understanding of roles of waves during ice expansion.	Obtain data on surface energy fluxes, waves, atmospheric boundary layer, and ice conditions in the marginal ice zone during autumn freeze-up.	Fairall	2015
SHOUT (Sensing Hazards with Operational Unmanned Technology)	NOAA	National	Quantify the significance of unmanned observations to high impact weather prediction through data impact studies using Observing System Experiments (OSE) using unmanned observations collected during prototype operational field missions and Observing System Simulation Experiments (OSSE) based on expected unmanned observing capabilities.	Project scientist; mission science support; operational, technical and engineering support of the Global Hawk dropsonde system	Wick, Jackson	2014-2016
StormVEx (Storm Peak Cloud Properties Validation Experiment)	DOE	Regional	Investigate mixed-phase clouds and precipitation in an orographically forced region (Storm Peak).	Oversee on-site operations of DOE equipment, communicate with coordinated aircraft, general mission planning, and data analysis.	Matrosov, Shupe	2010-2011
SWERUS-C3/ACSE Swedish-Russian-U.S. Arctic ocean Investigation of Climate Cryosphere Interactions/Arctic Clouds in Summer Experiment)	University of Stockholm, NOAA	International	Collect data to improve understanding of clouds, boundary-layer structure, and air-ice/air-ocean interactions in the marginal ice zone	CIRES members of PSD provided cloud and boundary-layer observations with remote sensors and had 4 scientists/engineers on board the Swedish icebreaker Oden for 3 months; NOAA/PSD provided instrumentation	Persson	2014
TORERO (Tropical Ocean Tropospheric Exchange)	NSF, NOAA	International	Measurements of volatile organics in the equatorial Pacific	Air-sea flux measurements of carbon monoxide	Fairall	2012
UBWOS (Uinta Basin Winter Ozone Studies)	UIMSSD, Western Energy Alliance, Questar, Energy Products, BLM, NOAA, EPA, Environment Canada, DEQ	Regional (Uinta Basin, UT)	UBWOS was initiated in the first quarter of 2012 to identify the emissions sources and the unique photochemical processes that cause elevated winter ozone concentrations, and to identify the most effective strategies to reduce winter ozone. UBWOS included measurements of ozone and ozone precursor concentrations and meteorological conditions throughout the Basin.	Provided tall tower measurements of surface fluxes, ground based measurements of net irradiance, standard surface meteorological variables	Zamora	2012-2014

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WFIP (Wind Forecast Improvement Project)	NOAA, DOE	Regional (Upper Midwest, TX)	Improve wind forecasts for wind energy applications through assimilation of new observations and through the development of improved model parameterization schemes	Deploy instrumentation, observe and understand meteorological processes, develop new physical parameterization schemes for numerical forecast models	Wilczak	2010-present
WFIP2 (Wind Forecast Improvement Project - 2)	NOAA, DOE	Regional (Pacific Northwest)	Improve wind forecasts for wind energy applications in regions of complex terrain through the development of improved model parameterization schemes	Deploy instrumentation, observe and understand meteorological processes, develop new physical parameterization schemes for numerical forecast models	Wilczak	2014-present
WHOTS (Woods Hole Oceanographic Institution Hawaii Ocean Timeseries Site) and STRATUS	NOAA	International	Climate observations: Flux reference buoy sites	Annual cruises to each site. Ship-buoy intercomparisons and air-sea fluxes at the Chilean and Hawaiian Flux Reference buoy sites	Fairall	2010-present
WISPAR (Winter Storms and Pacific Atmospheric Rivers)	NOAA	National	Initial demonstration of the research and operational applications of the Global Hawk unmanned aircraft to observe winter storms and Pacific atmospheric rivers	Mission scientist; dropsonde system operations; scientific data analysis	Wick, Spackman	2011
XPIA (Experimental PBL Instrumentation Assessment)	NOAA, DOE	Local (Boulder County)	Determine the applicability of new state-of-the art remote sensing instrumentation for wind energy	Deploy and test new remote sensing instrumentation at the NOAA Boulder Atmospheric Observatory (BAO) tall tower facility	Wilczak, McCaffrey	Ongoing