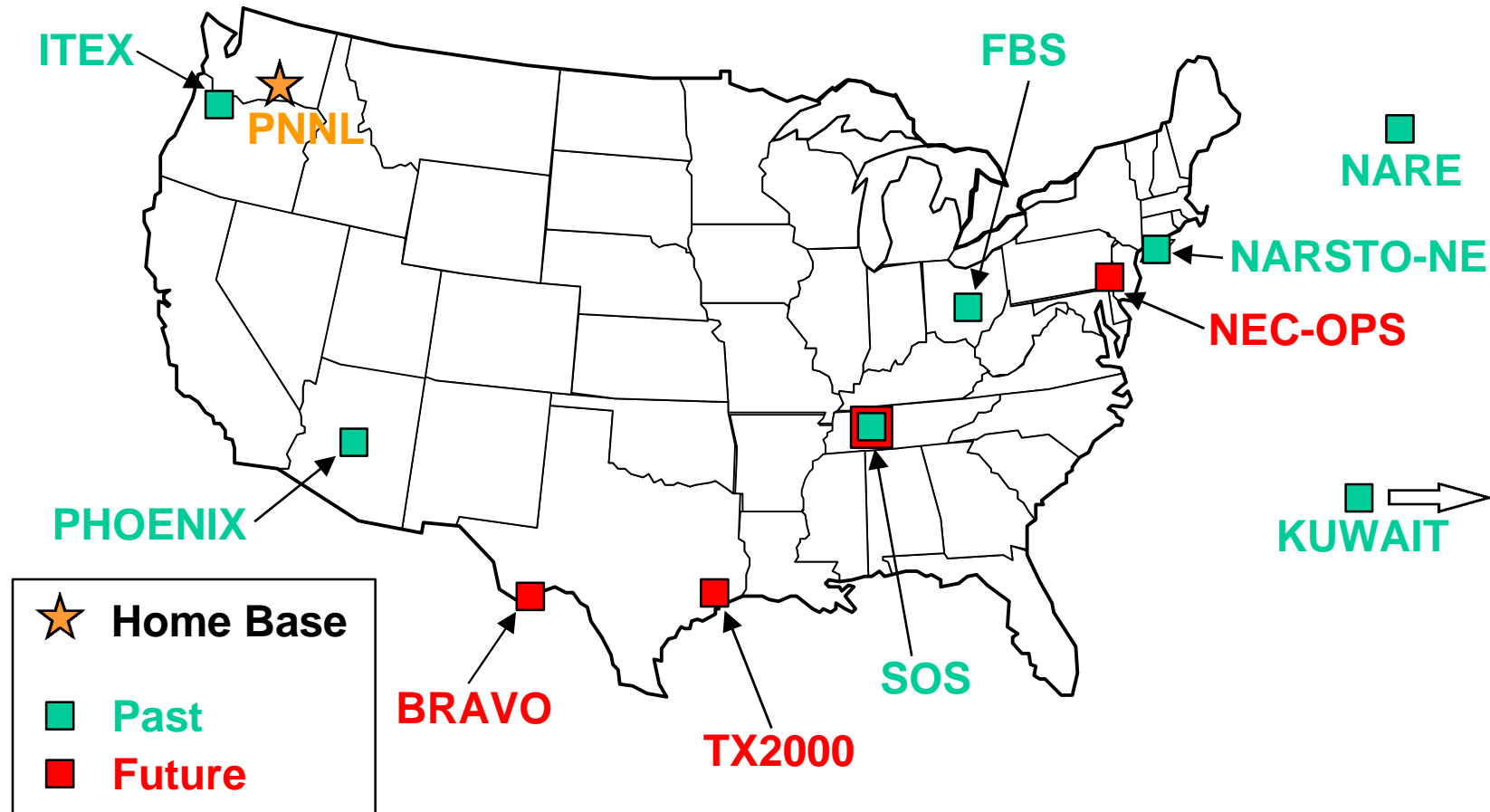


DOE Research Aircraft Facility Field Campaigns: Past and Future



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Locations of ACP Projects Using the DOE RAF G-1



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PNNL - Home Base

1987- Present

Pasco, Washington

- Base of DOE RAF operations with hangar for G-1 and laboratories for instrument development and calibration.
- Local flight testing of new instrumentation and data systems.
- Aircraft instrumentation configuration in preparation for field studies.

FBS - Frontal Boundary Study

October 1989

Columbus, Ohio

- Last field study of the predecessor to the Atmospheric Chemistry Program.
- Examined precipitation chemistry across warm frontal boundaries on the scale of a regional model grid cell.
- Surface precipitation chemistry network and aircraft sampling aloft.
- ANL, BNL, PNNL

Kuwait - Oil Fire Smoke

Baharain

- Airborne study of chemistry and physics of oil fire smoke plumes.
- Determined rate of transformation of SO_2 to sulfate within plume.

NARE - North Atlantic Regional Experiment

Summers of 1992 and 1993

Halifax, Nova Scotia

- Measured outflow of pollutants from North America over the western North Atlantic Ocean.
- Found distinct layers of high O₃ aloft that had origins in continental convective mixing and stratospheric injection.
- Investigation of new particle nucleation using a tandem mass spectrometer to measure H₂SO₄ and DMS.
- **AES-CA, ANL, Battelle Columbus, BNL, PNNL, SUNY-OW**

NARSTO-Northeast Summers 1995 and 1996 West Hampton (Long Island), New York

- Examined how entrainment of residual layer into growing convective boundary layer affects near-surface O_3 .
- Application of mass spectrometer for airborne detection of halogens in the atmosphere.
- Study of major urban pollution source (New York City) on downwind rural pollutant levels.
- **ANL, Battelle Columbus, BNL, EML, PNNL, SUNY-OW**

SOS - Southern Oxidants Study

Summers of 1995 and 1999

Nashville, Tennessee

- NO_x , VOC and O_3 chemistry in urban and power plant plumes.
- Role of boundary layer dynamics on pollutant concentrations.
- Nocturnal heterogeneous and gas-phase reactions of NO_x , oxidants and aerosols.
- Oxidant and aerosol chemistry at surface and aloft over a full diurnal cycle.
- Extensive surface air chemistry measurements support observations aloft by several aircraft
- **ANL, Battelle Columbus, BNL, GIT, NOAA, PNNL, TVA, SUNY-OW**

Phoenix

Spring 1998

Phoenix, Arizona

- Investigation of O₃ photochemistry and particle formation in an arid urban environment.
- Study of boundary layer dynamics on O₃ and particle production in urban basin.
- Aircraft observations supported by surface air quality sites, radar wind profiler and radiosondes.
- **ANL, BNL, PNNL, AZ-DEQ, SUNY-OW**

ITEX - Instrument Test Experiment

Summer 1998

Portland, Oregon

- Test of new atmospheric pressure inlet mass spectrometer for measuring HNO_3 and HONO.
- Test of PAN/ NO_2 detection method.
- First nighttime aircraft investigation of residual layer from an urban pollutant plume.
- **ANL, Battelle Columbus, PNNL**

**NEC-OPS - Northeast Corridor
Ozone and Particle Study
Summer 1999
Philadelphia, Pennsylvania**

- Role of urban VOC and NO_x sources on O_3 and particle production within and downwind of urban area.
- Role of rural-urban-rural transport of O_3 and particles and their precursors.
- **ANL, BNL, Harvard, Millersville, PNNL, PSU, Rutgers, SUNY-OW, U-MD**

BRAVO - Big Bend Regional Aerosol and Visibility Observational Study Fall 1999

Big Bend National Park, Texas

- Impact of emissions from major fossil fuel power plants on air quality and visibility within the Park.
- Perfluorocarbon tracers released at power plants to be detected with surface network and in real-time on aircraft.
- Interaction of regional scale and mesoscale meteorology on long-range and transboundary transport of pollutants.
- **BNL, DRI, EPA, INE-Mexico, PNNL, NPS, TNRCC**

TEXAS 2000

Summer of 2000

Houston - Galveston, Texas

- O₃ and particle formation in an extended urban area with land/sea breeze recirculation.
- Diurnal cycle in chemistry and meteorology in a complex emissions source region.
- Role of boundary layer meteorology on O₃ and particle formation and concentration.
- Extensive network of surface chemistry sites, radar wind profilers, radiosondes support multiple aircraft measurements aloft.
- **ANL, BNL, EPA, NOAA, PNNL, TNRCC, SUNY-OW**