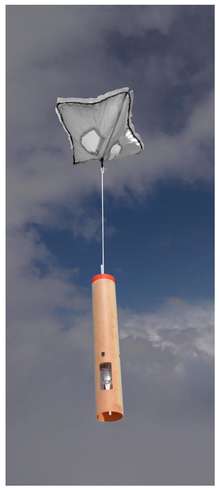
NCAR AVAPS Dropsonde Systems for Atmospheric Science

Holger Vömel, Terry Hock, Mack Goodstein, Clayton Arendt, Isabel Suhr, Justin Hicks, Jacquie Witte
National Center for Atmospheric Research, Earth Observing Laboratory

Dropsonde NRD41



Dropsondes released from research aircraft into hurricanes, winter storms, and other scientifically interesting meteorological conditions provide high resolution measurements of pressure, temperature, humidity, and winds.

These observations are used in fundamental research and operational forecasts of severe weather (hurricanes, atmospheric rivers, winter storms.)

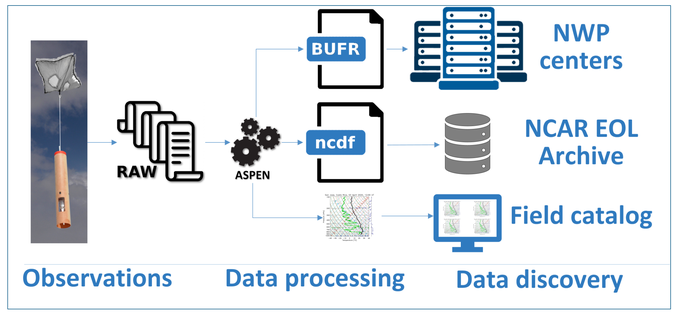
Platforms

NCAR dropsonde systems are installed on many different research aircraft:

- NSF/NCAR: GV and C-130
- USAF: WC-130
- NOAA: WP-3D AND G-IV
- NASA: King Air, P-3, DC-8, Global Hawk
- NPS/CIRPAS: Twin Otter
- UWYO: King Air
- DLR: G550
- FAAM: BAe-146
- CWB: G100
- KMA: King Air
- HKO: CL-605
- …

and have been used on long duration balloons

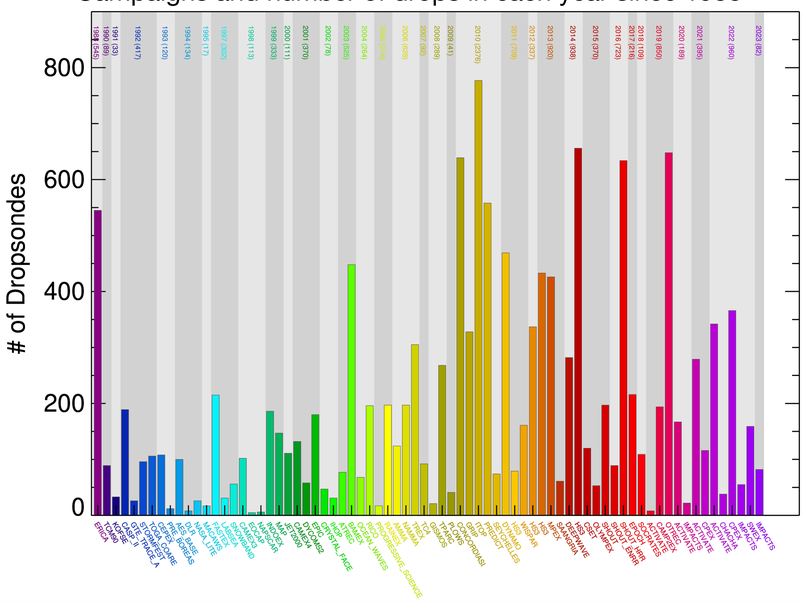
NCAR Data Support



- Collect data in the field and support other organizations in data collection
- Processes all data and perform data QC using ASPEN and other tools
- Archive and distribute all data
- Support research using these data

Dropsonde Campaigns

Campaigns and number of drops in each year since 1988



Nearly 14,000 dropsondes developed at NCAR were launched in 70 field campaigns led or supported by NCAR over the last 35 years.
Over 60,000 dropsondes launches by NOAA and USAF are not included here.

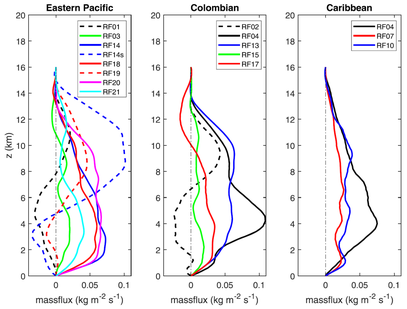
Dropsonde campaigns have taken place over all oceans, over Antarctica, and over the continental US.

Science

Dropsonde observations provide essential data to study a large range of atmospheric phenomena and to validate remote sensing instrumentation, e.g.:

- Tropical cyclones (e.g. Aberson et al., 2023)
- Downslope wind storms, SWEX (Carvalho et al., 2023)
- Validation of water vapor radar, CPEX (Millan et al., 2023)
- Convection, OTREC (Vömel et al., 2021)
  https://www.eol.ucar.edu/field_projects/otrec
- Aerosol-cloud interaction,
  ACTIVATE (Soroshian et al., 2023),
  SOCRATES (McFarquhar,et al., 2021)

Mass flux in convective events derived from dropsonde observations during OTREC (Fuchs-Stone et al., 2020)



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The dropsondes developed at NCAR are manufactured and marketed by Vaisala.

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