Atmospheric Dispersion and Boundary Layer Research Summary

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Air Resources Laboratory Review

May 3-5, 2011

Atmospheric Dispersion and Boundary Layer Posters and Demonstrations

Topic	Presenter
ARL Work Supporting Wind Energy	Chris Vogel
Harvard Flux Work	Ed Dumas
READY & WOC Tool	Glenn Rolph
HYSPLIT Decision Support Tool for INL EOC	Brad Reese
Atmospheric Tracer Technologies	Roger Carter
Balloon Technologies	Randy Johnson
Extreme Turbulence (ET) Probe	Rick Eckman
Best Aircraft Turbulence (BAT) Probe	Ed Dumas

Summary of ARL's Atmospheric Dispersion Research Program

- Two components: modeling and measurements
- Two world-class examples:
  - HYSPLIT model
  - Atmospheric Tracers
- Many other program elements
  - Decision Support Tools
  - Mesonets
  - Custom Instrument Development
- Collaborate with and support other NOAA entities, DOE, DOD, DHS, FAA, USGS, ICAO, NASA, etc.
- The program is in transition

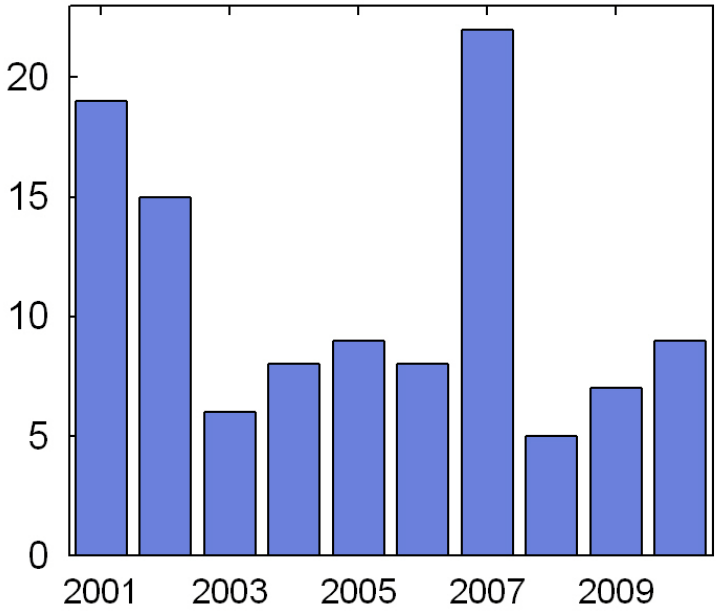
Summary of ARL's Boundary Layer Research Program

- New field of endeavor, and outgrowth from dispersion research
- ARL-developed instruments
  - ET Probe
  - Smart Balloon
  - BAT Probe
- Urban and complex terrain mesonets
- Renewable wind energy forecast research

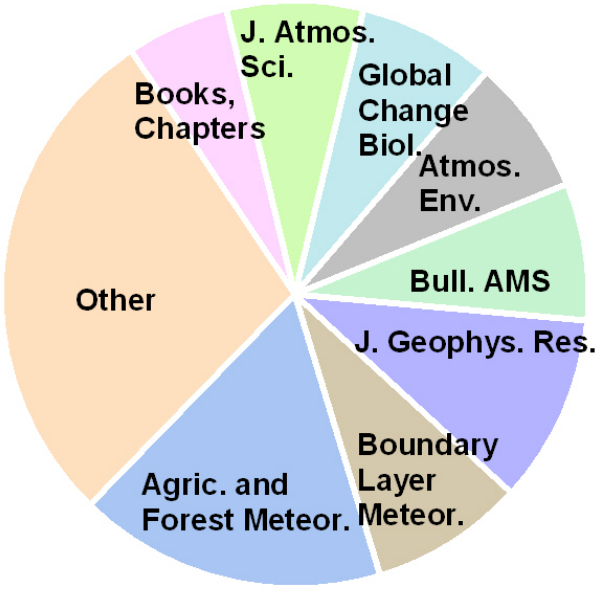
Indicators of Preeminence

ARL Dispersion and Boundary Layer Publications 2001-2010

Total = 109; Average = 11/year



Journals



Indicators of Preeminence (cont.)

- Department of Commerce Gold, Silver and Bronze Medals
- National and international recognition, adoption and use of research, tools and data
- Long-term funding relationships that have existed for more than 60 years
- Requests by funding agencies for our participation in highly visible experiments and modeling efforts
- Frequent mention in journal articles and scientific meetings
- Widespread media coverage

Future Plans

- Dispersion Research & Development
  - Increase integration and enhancement of a NOAA-wide plume prediction capability
  - Closer coupling of dispersion and meteorology models
  - Dispersion model integration into AWIPS-II
  - Improved HYSPLIT initialization with observations as given in Volcanic Ash Advisory
  - Develop new tracers with lower GWP
  - Develop lower cost autonomous fast-response measurements

Future Plans

- Boundary Layer Research & Development
  - Develop urban observatory for in-situ vertical observations of mean and turbulent winds and temperature
  - Continue long-term collaboration and partnerships with federal agencies
  - Support renewable energy weather-related research, particularly wind energy
  - Improve satellite calibration & validation algorithms for land surface temperature and soil moisture using *in situ* measurements
- Continue and increase cross-divisional collaborations

Questions?