

Challenges for the Weather Academic Community

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Meeting Objectives

- **Examine the strengths and weaknesses of the U.S. weather prediction enterprise**
- Discuss who is the weather prediction community and how community decisions should be made
- Examine the need for a more cooperative and coordinated approach to weather prediction operations and research
- **Discuss concrete next steps, consistent with the consensus of the meeting**

Background

- University community is diverse
 - Hard to generalize (e.g., state, land grant, private)
- Evolved over 50 years since end of WW II
 - Initial research focus – synoptic and dynamic meteorology (Golden Age: Chicago)
 - Entry level preparation for federal career (remains common thread to this day)
 - Train more scientists
- Developed in three or so episodes of growth in U.S. science generally
- Many programs “small” (~60), only a few (~10) can be considered “large”

Strengths

- Pool of extraordinary intellectual talent
 - Faculty
 - Research staff, career as well as post-docs
 - Students, undergraduate as well as graduate
 - International
- Scattered nationwide → understanding of local weather
- AMS + UCAR → common meeting grounds
- 50+ years of research → much of the foundation of modern meteorology originated in the nation's universities

Weaknesses

- Many programs small
 - Lack “critical” mass to tackle large problems
 - Can not afford to take risks → conservative, reluctant to embrace change (e.g., GIS slow to take hold)
- Reward structure still follows traditional single investigator model, encourages *science for science’s sake*
 - Primary bench mark of success is published papers
 - Quick return on time invested
- Gradually narrowing focus: ***observation and measurement, cloud physics, planetary boundary layer meteorology*** are not strong

Weaknesses

- Dichotomy often exists between faculty members' professional interests and student and employer desires and/or expectations
- Dependency on foreign graduate students to drive research enterprise
- Weak in linkages to “customers”, meteorological and non-meteorological
- Weak in technology transfer; lack capacity to do this effectively
- Low expectations, small dreams

Challenges

- CLIMATE Research dominates WEATHER Research these days
- Perception: wx prediction “good enough”, no real challenges left
 - Lack of federal research funding focused on weather research: observing, forecasting, post-analysis

Way Forward → Culture Change

- Good basic science remains central, however, recognize *true legacy is in the application of knowledge to solve real world problems*
 - In R&D, “D” is as important as “R”
- Entrepreneurial spirit, with high expectations → big dreams
 - Lead, not follow
 - Articulate possibilities
 - Search out new audiences

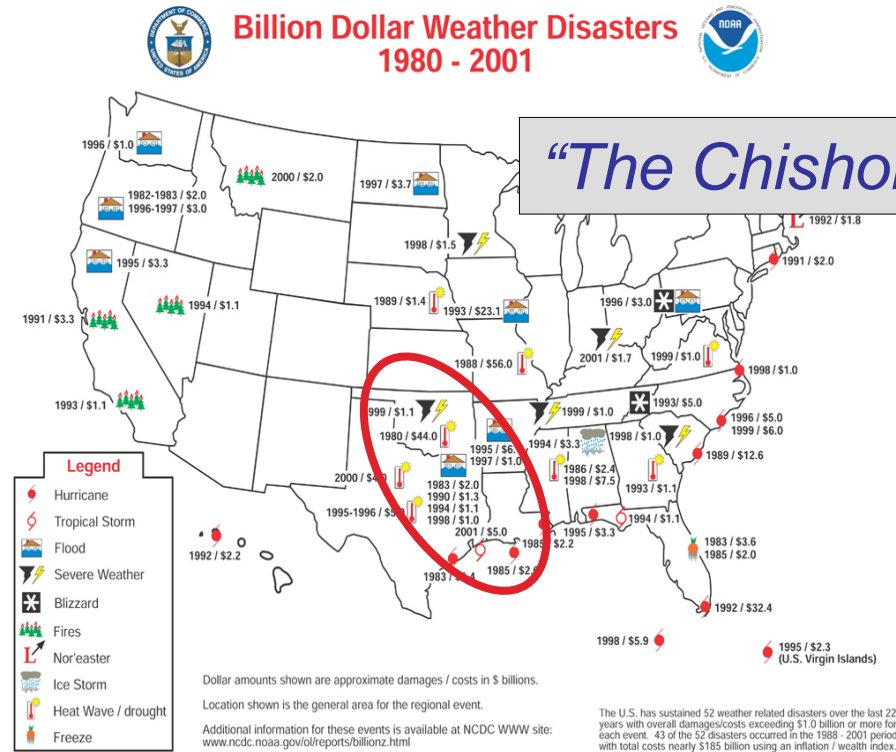
Way Forward → Culture Change

- Resolve the dichotomy with student (and employer) expectations and recognize we produce three types of graduates
 - Tomorrow's atmospheric scientists
 - “Meteorological engineers” → **design** of products and services
 - “Meteorological technologists” → **delivery** of products and services
- Connections to users, industry integral to the program
- Suggests that future of meteorological research and education will become more engineering-like
 - Hard for scientists to do

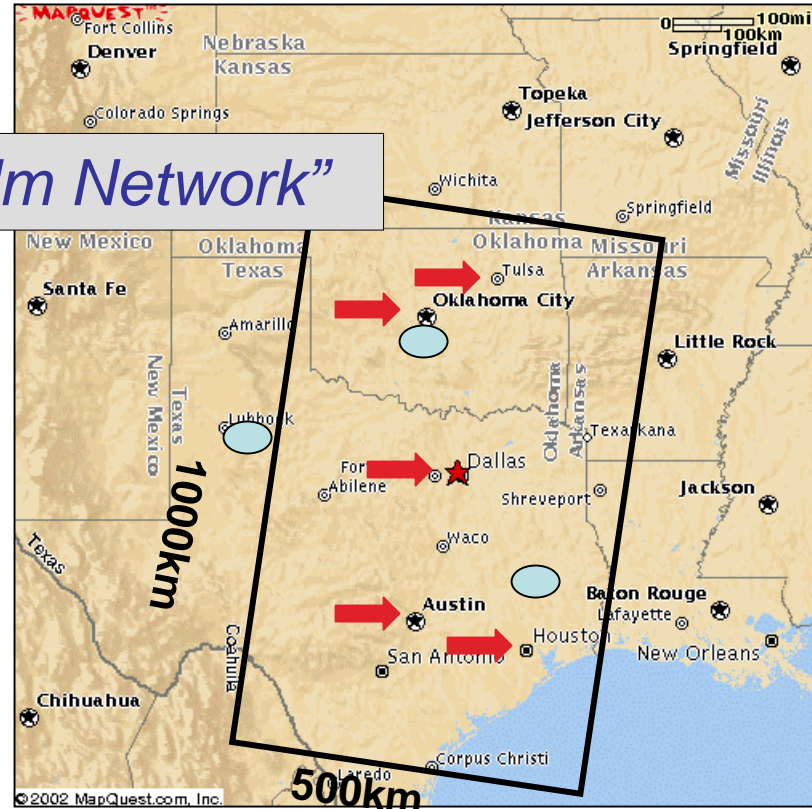
Way Forward → A Specific Proposal

- Multi-industry – multi-university regional consortia for ...
 - Experimental forecast facilities
 - Regional observing test beds → effective technology transfer
 - Academic partners beyond meteorology: geography, civil and electrical engineering

A Possible Prototype Network/Testbed?



"The Chisholm Network"



Major Cities included: Dallas-Ft. Worth; Houston; Austin; Oklahoma City; Tulsa

Adapted from a talk by Walt Dabberdt (2002)

