

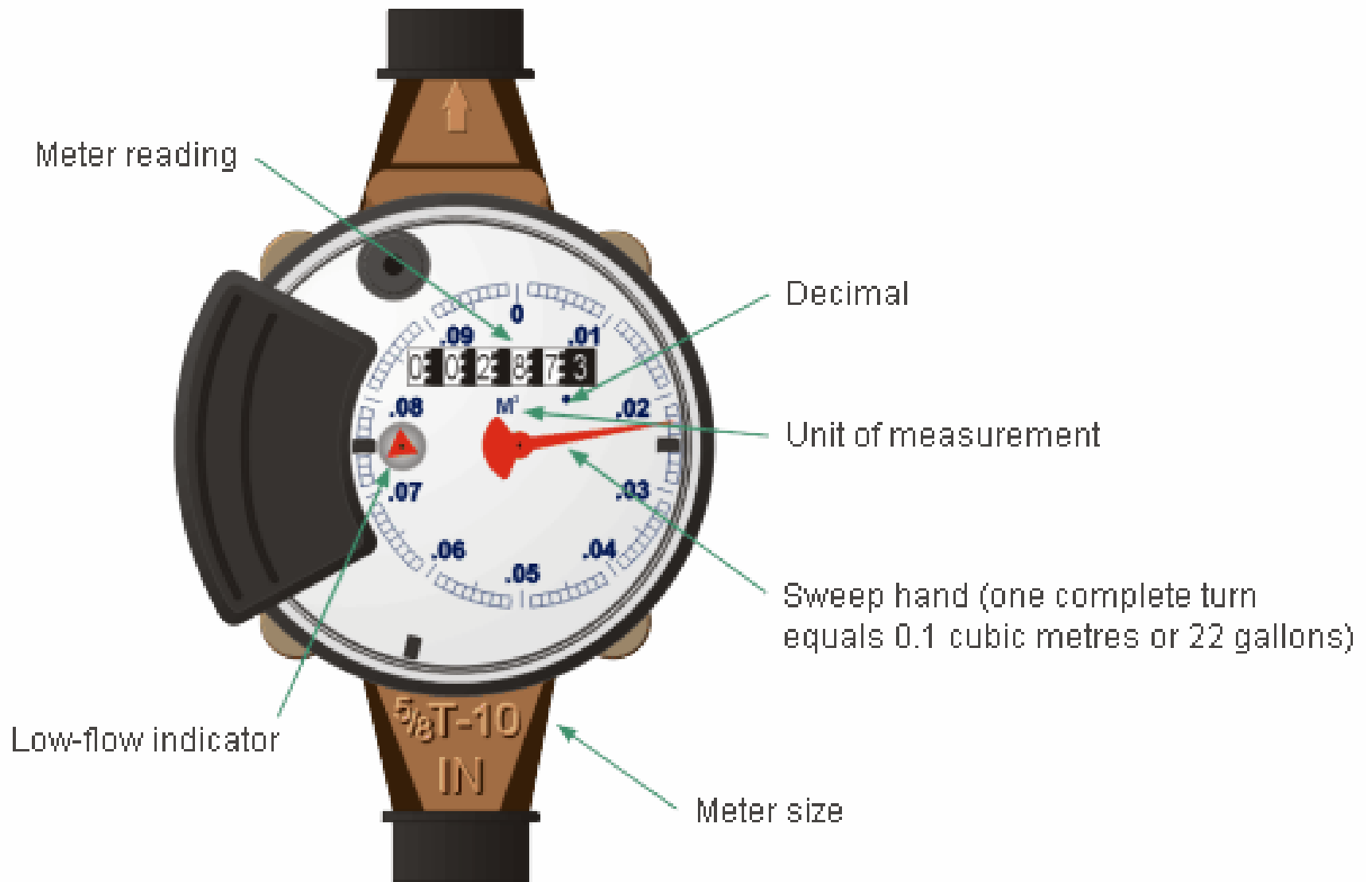
Paraglider and Tropical Storm Fay Corner canyon

- <http://www.youtube.com/watch?v=72i0Z42ru-o&feature=related>
- <http://hk.youtube.com/watch?v=3ljX-J-7VFc&feature=related>
- http://www.ksl.com/?nid=148&sid=4097842&auto_start=y
- <http://utube.smashits.com/video/M8bgLepJhV0/Corner-Canyon-Fire-Draper-UT.html>

What's the Difference Between a
Meteorologist and an Atmospheric
Scientist?



The Holsinger Meteorite is the largest discovered fragment of the 150-foot (45-meter) meteor that created Meteor Crater.





An atmospheric scientist is an individual with specialized education who uses scientific principles to explain, understand, observe or forecast the earth's atmospheric phenomena and/or how the atmosphere affects the earth and life on the planet.

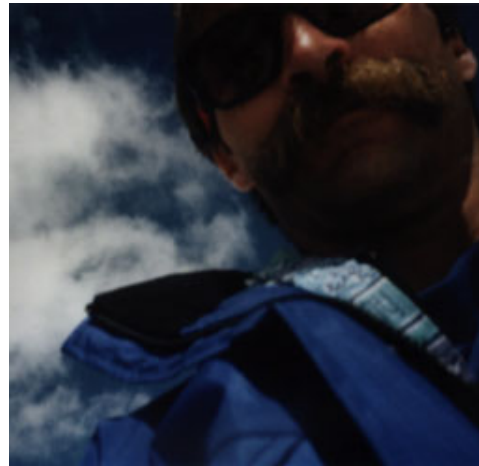
American Meteorological Society

Who ARE Meteorologists?



Careers

- Core Areas
 - NWS
 - Research
 - Education
 - Private Industry
 - Broadcasting
- Interdisciplinary opportunities
 - Avalanche forecasting
 - Road weather
 - Fire weather
 - Air quality
 - Hydrologic forecasting



Check Out the Alumni

- http://www.met.utah.edu/alumni/Directory_Registry



Current Salaries

- Median annual earnings of atmospheric scientists in May 2006 were \$77,150
- The middle 50 percent earned between \$55,530 and \$96,490
- The average salary for meteorologists employed by the Federal Government was \$84,882 in 2007
- Many meteorologists in the Federal Government with a bachelor's degree received a starting salary of \$35,752

Bureau of Labor Statistics

Future Trends: 2016 Careers

- Broadcasting: +10% (600)
- Professional & Technical Services +25% (4500)
- Education +11% (800)
- Government -5% (3300)
- Bureau of Labor Statistics. <http://www.bls.gov/oco/ocos051.htm#outlook>
- Atmospheric and space scientists

TABLE 3. Career choices of bachelor's degree recipients in meteorology from the 2000 *Curricula* and the current online *Curricula*. Boldfaced numbers indicate the largest single career choice for each time period.

Period of record	No. of graduates included	Civilian government	Military service	Private sector	Further university education	University employment	Other	Unknown
1997–99	711	9.99%	9.85%	28.69%	19.83%	0.56%	4.36%	26.72%
2003–05	624	7.69%	10.10%	18.59%	29.33%	0.48%	6.09%	27.72%

Department of Meteorology: University of Utah

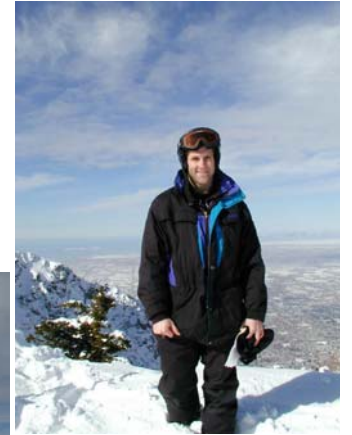


A meteorology department with
global reach, regional expertise, and
world-class educational and research
opportunities

- 13 Academic and Research Faculty
- 14 Emeritus, Adjunct, and Auxiliary Faculty
- 10 Staff
- 30 Graduate Students
- 100 Undergraduate Students
- 800+ alumni & friends

The Students

- 100+ undergraduates
 - 6-15 graduate per year
 - Mixture of
 - in-state/out-of-state
 - Straight from high school/return after employment
- 30 graduate students
 - 5-10 new students per year
 - Most from out of state

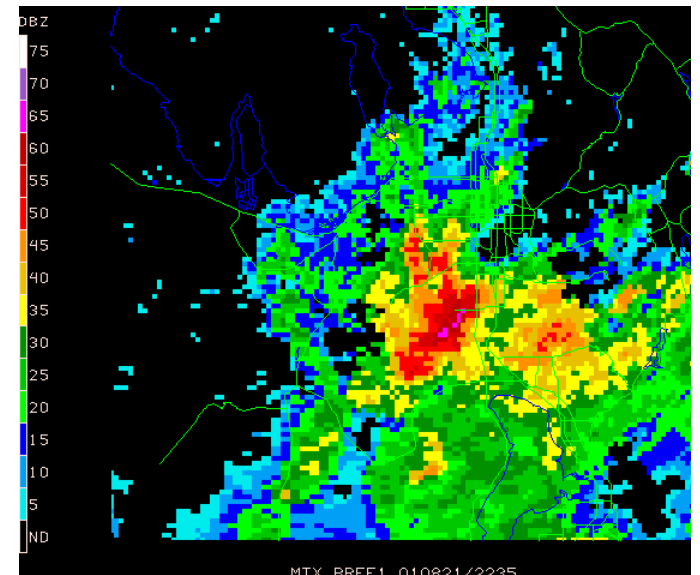
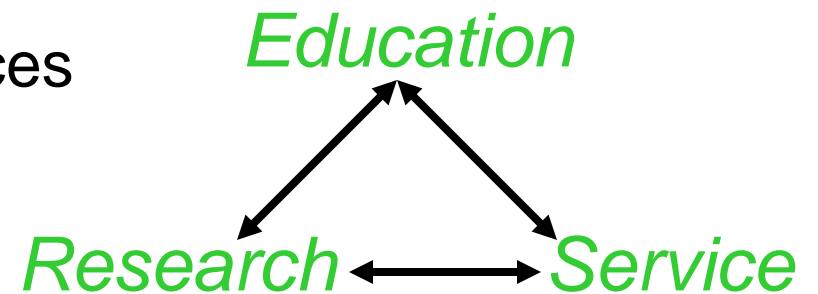


Why Study Meteorology?

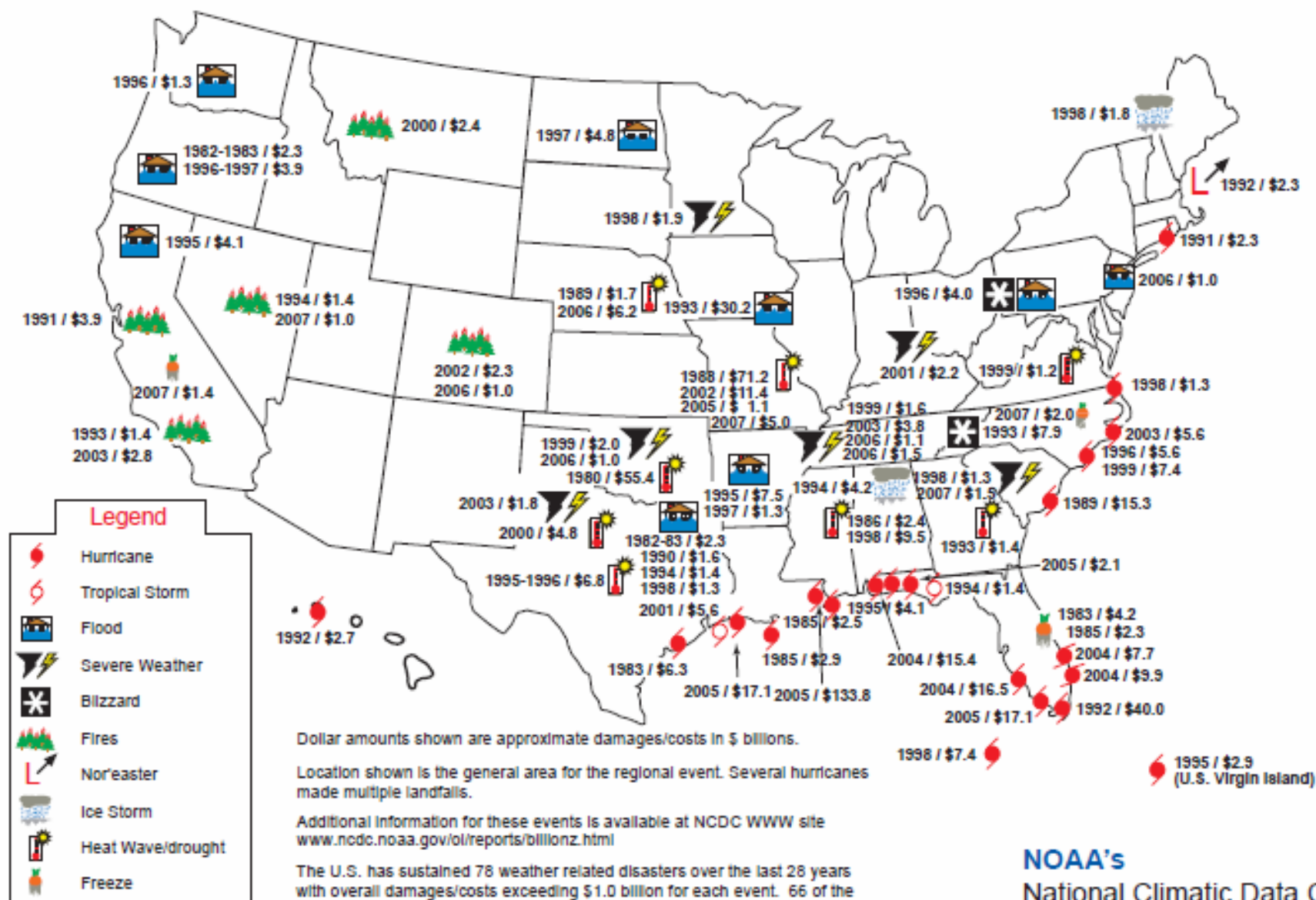
- Weather junkie since elementary school?
- Interested in the environment?
- Like to be outdoors?
- Like computers and graphics?
- Like math and science?
- Not sure why?
 - That's the purpose of this course

Mission of Department of Meteorology

- Educate undergraduates on fundamentals of atmospheric sciences
- Provide educational and research foundation in the atmospheric sciences for graduate students
- Conduct research that expands the knowledge base in the atmospheric sciences
- Serve the atmospheric science community and conduct basic and applied research that benefits the public



Billion Dollar Weather Disasters 1980 - 2007



1992 / \$2.7

1996 / \$1.3

1982-1983 / \$2.3
1996-1997 / \$3.9

1995 / \$4.1

1991 / \$3.9

2007 / \$1.4

1993 / \$1.4
2003 / \$2.8

2000 / \$2.4

1997 / \$4.8

1998 / \$1.9

1989 / \$1.7
2006 / \$6.2

1993 / \$30.2

2002 / \$2.3
2006 / \$1.0

1988 / \$71.2
2002 / \$11.4
2005 / \$ 1.1

1999 / \$2.0
2006 / \$1.0

1980 / \$55.4

2003 / \$1.8

2000 / \$4.8

1982-83 / \$2.3

1990 / \$1.6
1994 / \$1.4
1998 / \$1.3

1995-1996 / \$6.8

2001 / \$5.6

1995 / \$7.5
1997 / \$1.3

1994 / \$4.2

1986 / \$2.4
1998 / \$9.5

1999 / \$1.6
2003 / \$3.8
2006 / \$1.1
2006 / \$1.5

2001 / \$2.2

1999 / \$1.2

2007 / \$2.0

1993 / \$7.9

1998 / \$1.3

2003 / \$5.6
1996 / \$5.6
1999 / \$7.4

1989 / \$15.3

2005 / \$2.1

1983 / \$4.2
1985 / \$2.3

2004 / \$7.7
2004 / \$9.9

1994 / \$1.4

2004 / \$15.4
2004 / \$16.5
2005 / \$17.1

1992 / \$40.0

1998 / \$1.8

1992 / \$2.3

1991 / \$2.3

2006 / \$1.0

1998 / \$1.3

2003 / \$5.6
1996 / \$5.6
1999 / \$7.4

1998 / \$1.3

2007 / \$1.9

1998 / \$7.4

1995 / \$2.9
(U.S. Virgin Island)

Learning Through Course Work

- Structured program that builds on foundation of prerequisite courses
- Mix of required courses and elective courses tailored to your interests
- Incorporate current understanding and also areas where further research is necessary



Learning Through Doing

Utah Ski Weather.com - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://www.utahskiweather.com/

NWS-SLC CSA Internet Database... AMS Journals Glossary Royal Meteorological ...

UNIVERSITY OF UTAH DEPARTMENT OF METEOROLOGY - AMERICAN METEOROLOGICAL SOCIETY

UtahSkiWeather.com

home
forecasts
conditions
discussions
contact us

❄️ Forecasting the Greatest Snow on Earth™ ❄️

CURRENT CONDITIONS

- Alta/Snowbird
- Brighton/Solitude
- Snowbasin
- Park City
- The Canyons
- Sundance

LIVE CAMERAS

- Park City
- Alta
- Snowbird
- Solitude
- Brighton
- Snowbasin

DISCUSSIONS

- Weather Discussion
- Snow Conditions Discussion
- Powder Meter

NEWS

March 31st, 2006

Well, a truly epic winter season is winding down. You wouldn't know it from the weather. Frequent storms continue to dump snow on the mountains of northern Utah as they have all winter, bringing us tons of powder days!

(more news)

CLICK ON A RESORT TO SEE ITS FORECAST

image courtesy of skiutah.com

Park City Resort - Brighton - Sundance - Alta - Snowbird - Solitude - Backcountry
Powder Mountain - Deer Valley - The Canyons - Beaver Mountain - Snowbasin

CURRENT RADAR

CURRENT SATELLITE

ROAD CONDITIONS

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home | forecasts | conditions | discussions | contact us

Research that's out of this world



Research in places that seem out of this world



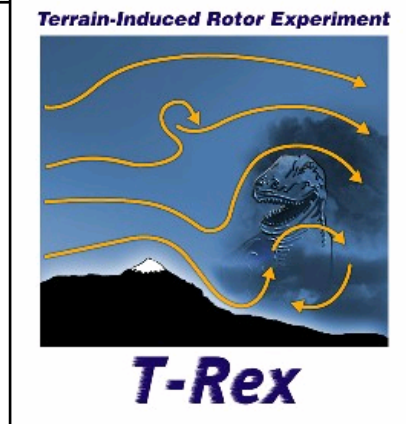
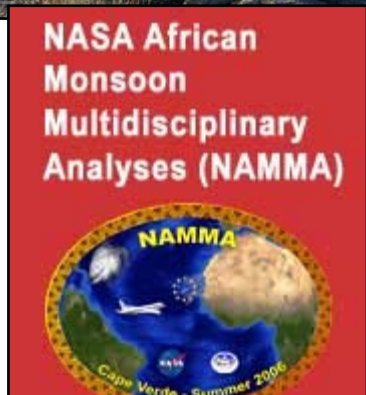
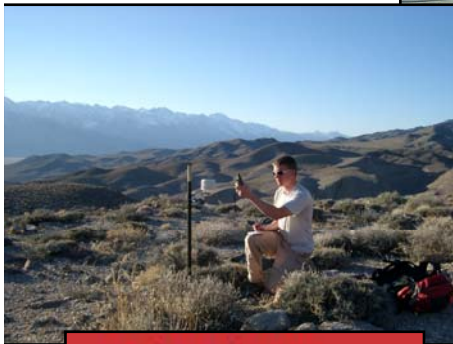
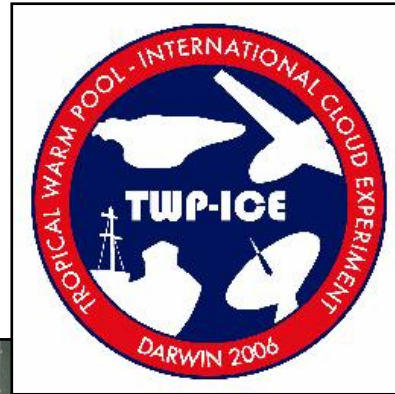
Mars or ...?

The Meteor Crater Experiment

METCRAX 2006

<http://www.met.utah.edu/whiteman/METCRAX/>

Field Work



Research with global reach



Vol 440|6 April 2006|doi:10.1038/nature04636

nature

LETTERS

Increased Arctic cloud longwave emissivity associated with pollution from mid-latitudes

Timothy J. Garrett¹ & Chuanfeng Zhao¹

BREVIA

Enhanced Mid-Latitude Tropospheric Warming in Satellite Measurements

Qiang Fu,^{1,2*} Celeste M. Johanson,¹ John M. Wallace,¹ Thomas Reichler³

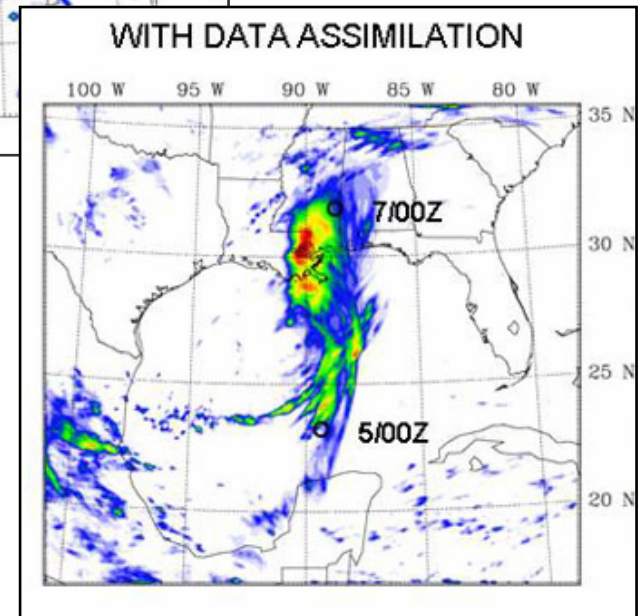
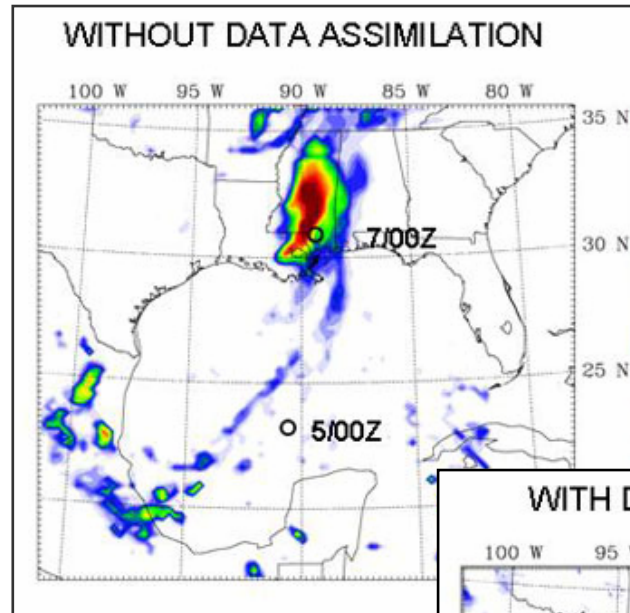
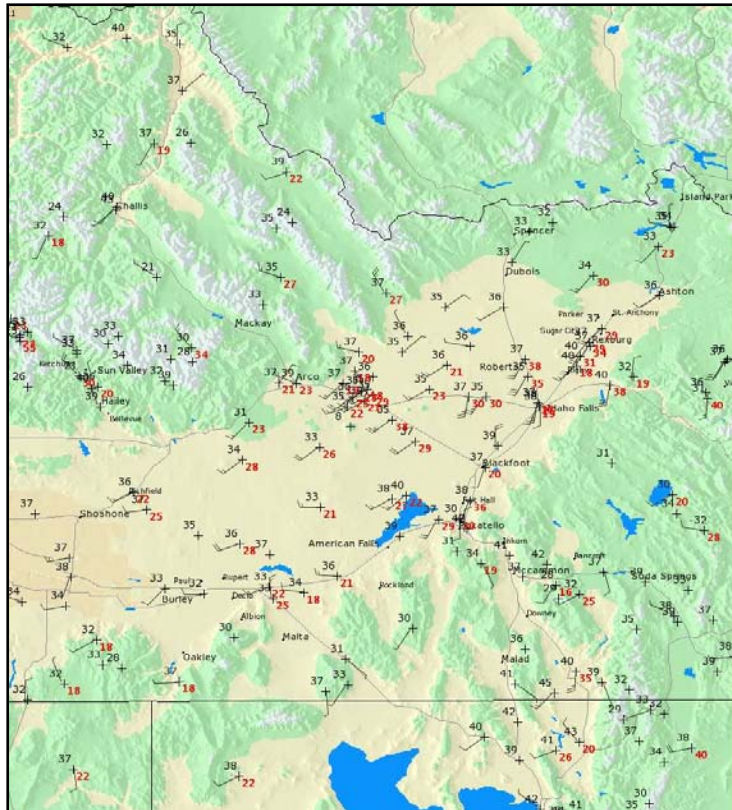
Boreal summers that follow strong El Niño events, like the one that occurred in 1997, are often characterized by anomalous tropospheric warmth in mid-latitudes of both the Northern and Southern Hemisphere. This warmth occurs in response to El Niño/Southern Oscillation (ENSO)-induced, positive-sea-surface temperature (SST) anomalies in the

spheric and tropospheric temperature trends for 1979 to 2005 and the corresponding zonal mean latitudinal profiles. To emphasize the spatial gradients in the trends, the reference (white) values in the color bars in (Fig. 1, A and B) are set equal to the respective global mean trends. The most pronounced feature is the enhanced stratospheric cooling and tropospheric warming

a systematic poleward shift of the jet streams implies that the tropical circulation has widened by $\sim 2^\circ$ latitude during this 27-year period (7). (Our analysis of the National Centers for Environmental Prediction/National Center for Atmospheric Research reanalyses suggests that sea-level pressures near 30°N and 30°S have risen relative to surrounding latitudes. Such pressure rises, if real, would cause an additional poleward shift in the jet streams.)

In contrast to the seasonally dependent circulation changes reported in association with the Northern and Southern Hemisphere annular modes, the changes reported here are occurring at somewhat lower latitudes, and the Northern Hemisphere trends are no less pronounced during the warm season (fig. S4) than during the cold season.

Research with relevance to society



Public Service



Lis Cohen "down under"
at an aboriginal school



Shelby Sharples (BS '06) in
a Utah classroom



The Academic Faculty

- Tim Garrett. Cloud/climate interactions
- John Horel. Mesoscale observation and analysis
- Steve Krueger. Numerical simulation of clouds
- Jay Mace. Cloud properties
- Kevin Perry. Aerosols and air chemistry
- Zhaoxia Pu. Data Assimilation
- Thomas Reichler. Large-scale atmospheric dynamics
- Jim Steenburgh. **Chair**. Synoptic and complex terrain meteorology
- Ed Zipser. Tropical Convection



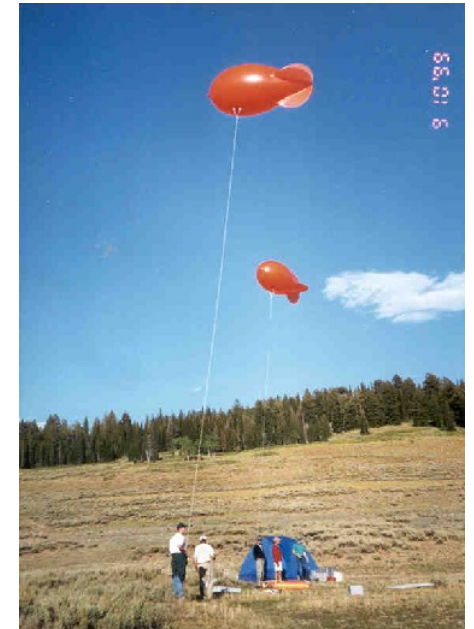
Other Faculty and Staff

- Other Faculty
 - Nori Fukuta. Emeritus. Cloud physics
 - Mary Ann Jenkins. Fire weather
 - Chuntao Liu. Remote sensing
 - Jan Paegle. Emeritus. weather prediction
 - Julia Paegle. Emeritus. Climate dynamics
 - Gene Robl. Instructor
 - Vince Solomonson. Remote sensing
 - Dave Whiteman. Mountain meteorology
- Department Office- 819 WBB
 - Leslie Allaire
 - Kathy Roberts
- Computer Support- Bryan White



Research

- ~4 million dollars in research funding
- Major Emphases
 - Mountain Weather
 - Clouds, aerosols, and climate
 - Numerical weather prediction
 - Atmospheric dynamics and climate variability
 - Tropical convection
 - South American weather and climate



Philosophy of Undergraduate Program

- Atmospheric sciences requires solid foundation in mathematics, physics, computer science, and chemistry
- Information technology skills are increasingly recognized as being important
- NOT a specific career training program- average individual changes careers 3 times during their lifetime
- Obtain skills to be a future leader in the profession

A B.S. degree from our department
will mean you know...

- How to communicate effectively orally and in writing
- Basic concepts in the atmospheric sciences
- Can apply knowledge to a variety of applications
- Be a problem solver

Programs of Study

- Professional Meteorologist
- Environmental Scientist
- Meteorology with a business minor
- Atmospheric Scientist

Undergraduate Program

- Prerequisites for upper-division standing
 - Math- Calculus (1210, 1220), Linear algebra, diff eqns (2250, 2210)
 - Chemistry 1210 (1215)
 - Physics- 2210 (2215), 2220 (2225)
 - Comp Sci 1000, 1010
 - Wrtg 2010
- Meteorology courses
 - 1010, 1020, 2810, 3000, 3100



Upper Division Courses

- 1st year
 - 3110, 3410, 5110
 - 5410 (Remote Sensing) or 5120 (Stat)
 - Writing
- 2nd year
 - 5530, 5540, 5810 (Synoptic)
 - 5210 (Physical), 5140 (Meso)
 - 5410 (Remote Sensing) or 5120 (Stat)
- Electives
 - Other opportunities: Avalanche, hydrology, Communications, Math, Computer Science, GIS, business
- Schedule designed to be either MWF or TH IF on track



Student Involvement

- Student chapter of AMS. First meeting Sept. 3 beginning at 12:30 PM
- Weather discussions
- Weather on web page
- Campus weather forecast
- Service to department: faculty reviews & planning
- Undergraduate research projects
- Field projects

Perception and Trends

- Undergraduate degree programs around the U.S.
 - ~30 Atmospheric Science
 - 6 Meteorology
 - ~11 Environmental or Earth Science
 - ~8-10 others

In the next couple of years...

- Department may be renamed the Department of Atmospheric Sciences
- New faculty member
- Changes to undergrad curriculum to increase flexibility of course offerings- fewer required classes, more electives
- Increased emphasis on capstone course

Meteorology 2810

- Opportunity to meet other undergraduates, graduate students, staff, faculty
- Learn about:
 - department activities
 - the academic program
 - career opportunities through seminars and tours
 - Academic-year and summer intern programs and part-time jobs
- See web page for more info:
 - <http://www.met.utah.edu/class/jhorel/2810/>

Tentative Seminar Schedule

- August 27. John Horel. What's the Difference Between a Meteorologist and an Atmospheric Scientist? [Reading assignment: Bachelor's degree in atmospheric science](#)
- September 3. Student AMS chapter. 12:30 PM
- September 10. Meteorological Solutions tour. Leave at 12:30 return at 2:15.
- September 17. Randy Julander. Utah Snow Survey. Snow Survey and Water Resource Management- do you really get paid to ski?
- September 24. NWS tour. Leave at 12:30 return at 2:15 [NWS map](#)
- October 1. Fire Weather. Ed Delgado. BLM
- October 8. TV station tour. Leave at 12:30 return at 2:30
- October 15. Fall Break
- October 22. Open
- November 5. From Earth to Air to Sky. Confessions of a Hanggliding Hydrologist. Lisa Verzella. Central Utah Project.
- November 12. Forecasting Your Career- Rather than Chasing Your Career. Jim White. Asst. Director Career Services Office. And Advising Opportunity for Spring Semester with John & Kevin
- November 19. Tour of UDOT Traffic Operations Center. Leave at 12:30 return at 2:30.
- November 26. Thanksgiving Week. No seminar
- December 3. Open
- December 10. John Horel. Course wrap up

What is Required for 2810?

- Show up for all scheduled events
- Some tours will require starting early and going longer
- Sign the roll sheet
 - Arrive on time and stay for the entire class period
 - Notify me by email (john.horel@utah.edu) if you are going to miss class BEFORE the class period
 - Be courteous to the presenters
- Attend at least 1 weather discussion during the semester: T H 490 INSCC 12:55- 1:30
 - Contact me if you have a scheduling conflict

Advising Issues

- Talk to me before/after class
- Send email to meteo-advising@lists.utah.edu
- Students A-L: Horel
- Students M-Z: Perry



Photo: M. Splitt

Your role...

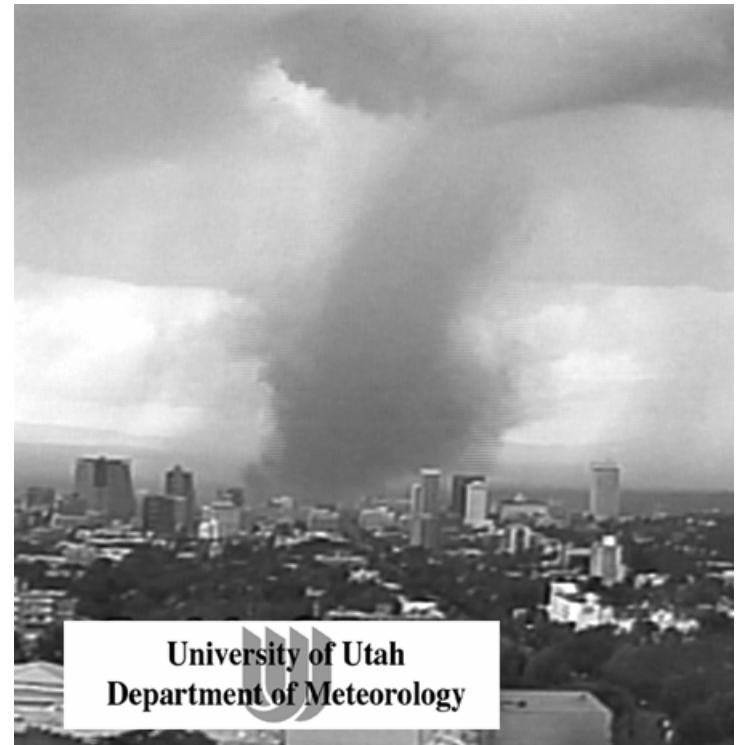
- Be an active learner...
- Recognize that there is a purpose for prerequisites- all classes are important
- Be an active participant in the department...
- Begin to identify what are your strengths, weaknesses, and interests
- Seek out internships and employment opportunities

Questions?



Photo: Dick Denning

Ed Zipser



**University of Utah
Department of Meteorology**