

New Cross-Directorate Program on Disaster Resilience, Vulnerability and Risk Reduction



**Mel Shapiro
NCAR Boulder CO**

.....enable rational decisions that reduce human, economic and environmental losses,

and also maximize socioeconomic opportunities.

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BAMS →

Bulletin of the American Meteorological Society



PUTTING IT ALL TOGETHER

An Earth-System Prediction Initiative

An Earth-system prediction initiative for the 21st century*

M. A. Shapiro, *et al.*

Addressing the complexity of the Earth system*

Carlos Nobre, *et al.*

**Toward a seamless process for the prediction of weather and climate:
the advancement of sub-seasonal to seasonal prediction***

Gilbert Brunet, *et al.*

**Climate prediction from weeks to decades in the 21st century: towards a new
generation of world climate research and computing facilities**

J. Shukla, *et al.*

A holistic approach

Earth-system sciences, mitigation and adaptation strategies require a suite of diagnostic and prediction models, and services. The proposed approach is:

Spatially and Temporally Continuous, spanning highly-localized cloud systems to global circulations, from minutes to millennia; linking mesoscale weather life cycles and climate variability and change.

Integrated Across the Disciplines of physics, mathematics, biology, chemistry, social and decision sciences, and their Earth-system elements.

Coordinated and Supported across academic institutions, government research and service agencies, private enterprise providers, hazard risk-reduction and adaptation agencies, and humanitarian organizations.

Bridges Political Boundaries, municipalities to nations to the world.

Socioeconomic and environmental requirements play a leading role in the design and implementation of a new generation of science-based global to regional early-warning and planning systems.

Community perspectives for accelerating advances
in weather, climate and Earth-system monitoring,
prediction and services.



Town Hall : 8:00-9:00 pm, 24 January 2011
Annual Meeting of the American Meteorological Society
Seattle, Washington

Chet Kablinski: Director, Climate Program Office, Office of Oceanic and Atmospheric Research, National Oceanic and Atmospheric Administration.

William T. “Kim” Curry: Deputy Technical Director Office of the Oceanographer of the Navy.

Timothy Killeen: Assistant Director for the Geosciences (GEO), National Science Foundation (NSF)

Michael Morgan: Director of the Atmospheric and Geospace Sciences Division of NSF
He is on leave from the University of Wisconsin-Madison where he is a professor in the Department of Atmospheric and Oceanic Sciences.

Jack Kaye: Associate Director for Research, Earth Science Division, Science Mission Directorate

Gilbert Brunet: Chair of the World Weather Research Programme

Is there a willingness, readiness and capacity to establish an Earth-system Prediction Initiative to provide the research and services required to accelerate advances in weather, climate and Earth-system prediction, and the use of this information by global and national societies ?

It will take a decade or longer to achieve the ambitious goals detailed in the four BAMS papers, Belmont Report, and recent parallel articles and reports.

We must convey the excitement and timely opportunity for young scientists to embrace a multidisciplinary and interdisciplinary approach to the scientific challenges before them and society. Most are resistant to take on this challenge, as it involves a higher degree of career risk than traditional single discipline research. They take the position that, "Socioeconomic engagement/applications are not of great interest to me. People can read my papers and apply my results".

Agency leaders are moving in this new direction.

Curiosity-driven science is no longer the leading justification for initiating and supporting major new Earth-system programs..

Elder scientists and can pioneer the pathway, but only if there is an overwhelming community commitment to embark on this journey.

Vulnerability: UK Floods July 2007



Irish Resiliency



Crowds panic as flooding threatens Ireland...



Hurricane Katrina 2006: New Orleans, Louisiana



IMPACT YOUR WORLD



Food crisis spreads across the globe

Rising food prices have transformed food into an international political issue. Riots have erupted in Egypt, Haiti and Bangladesh. People fought over bags of rice in West Africa. The causes and the solutions to the food crisis are complex.



Ethanol

Ethyl Alcohol

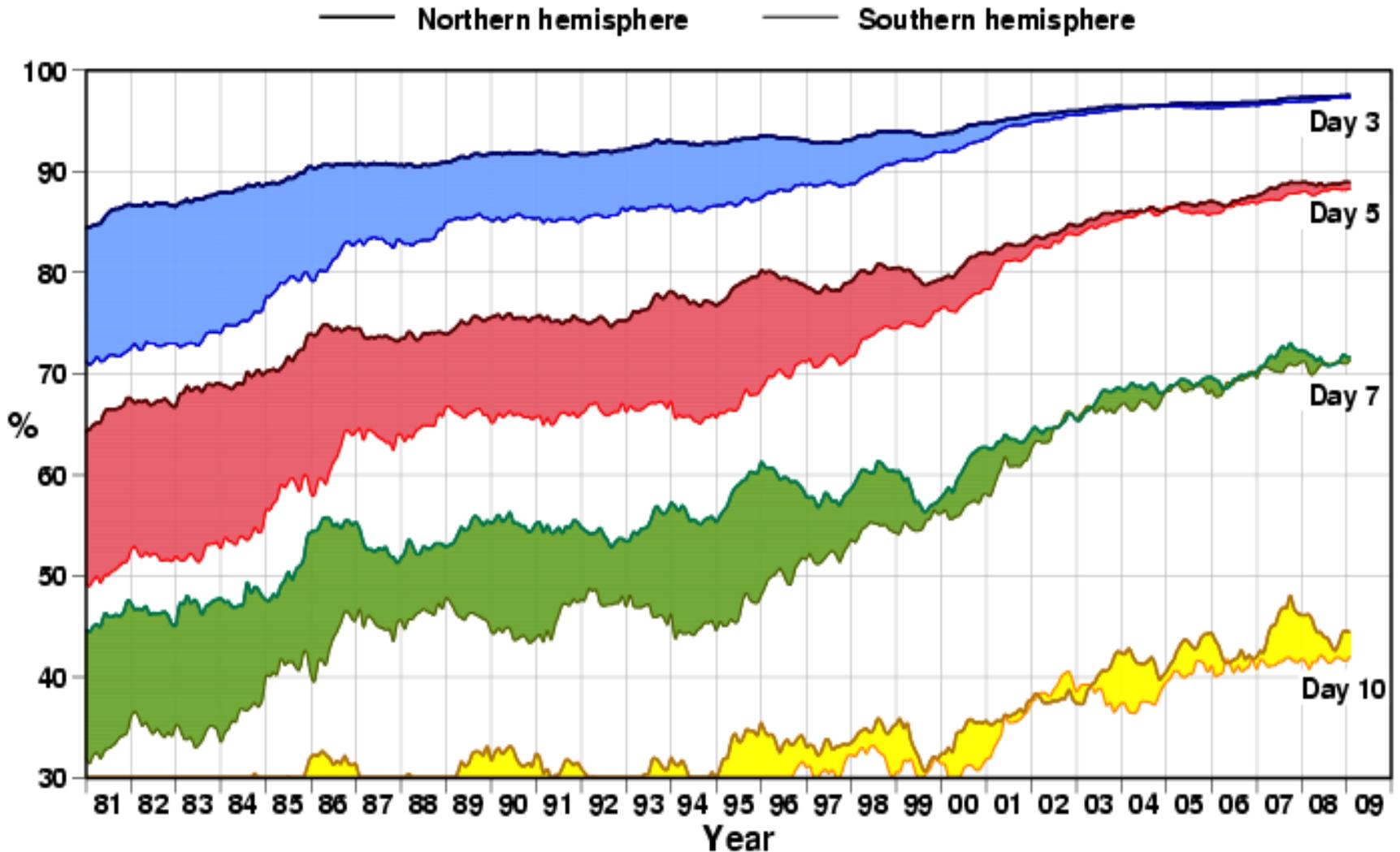
In order for weather, climate and earth-system information to impact socioeconomic activities, several elements must be attained:

- **Content:** accuracy and precision in space and time with relevance of product information to the users
- **Distribution:** product dissemination on spatial and temporal scales sufficient for action
- **Communication:** product formats that users can comprehend and interpret
- **Recognition:** recognition by users that the information has value
- **Response:** actions taken by users in response to the information

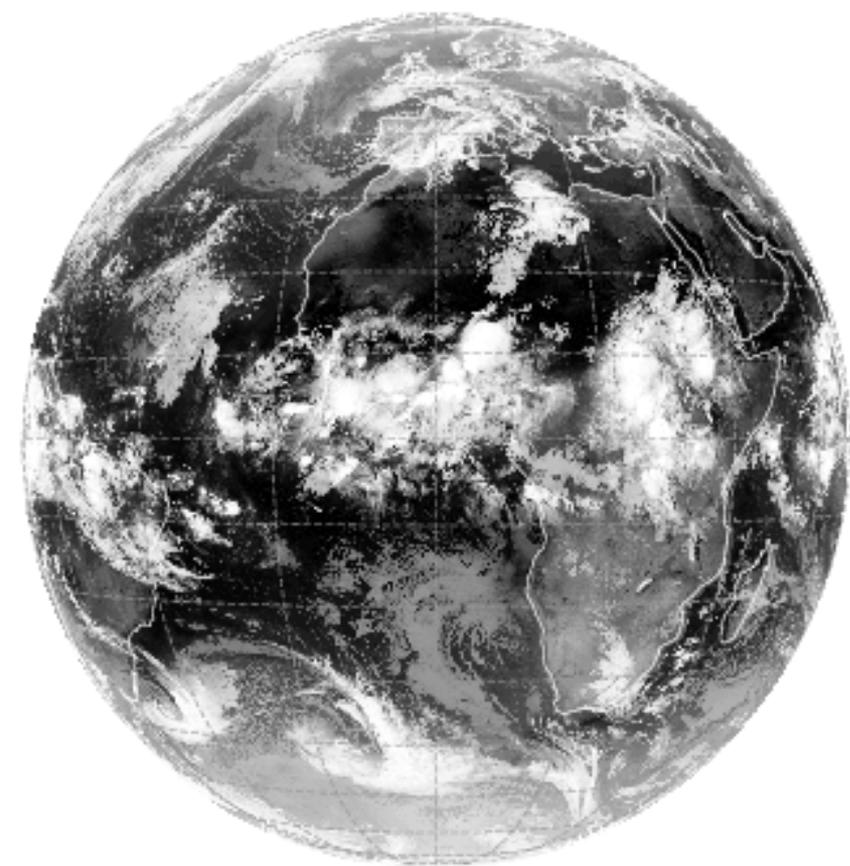
These elements are links along a chain of action. If any one link is broken, then the impact and the value of the weather/climate information will be diminished. Socioeconomic research and its applications can identify weaknesses in these links and lead to the development of new methods for enhancing the use and value of weather and climate information.

RISK REDUCTION

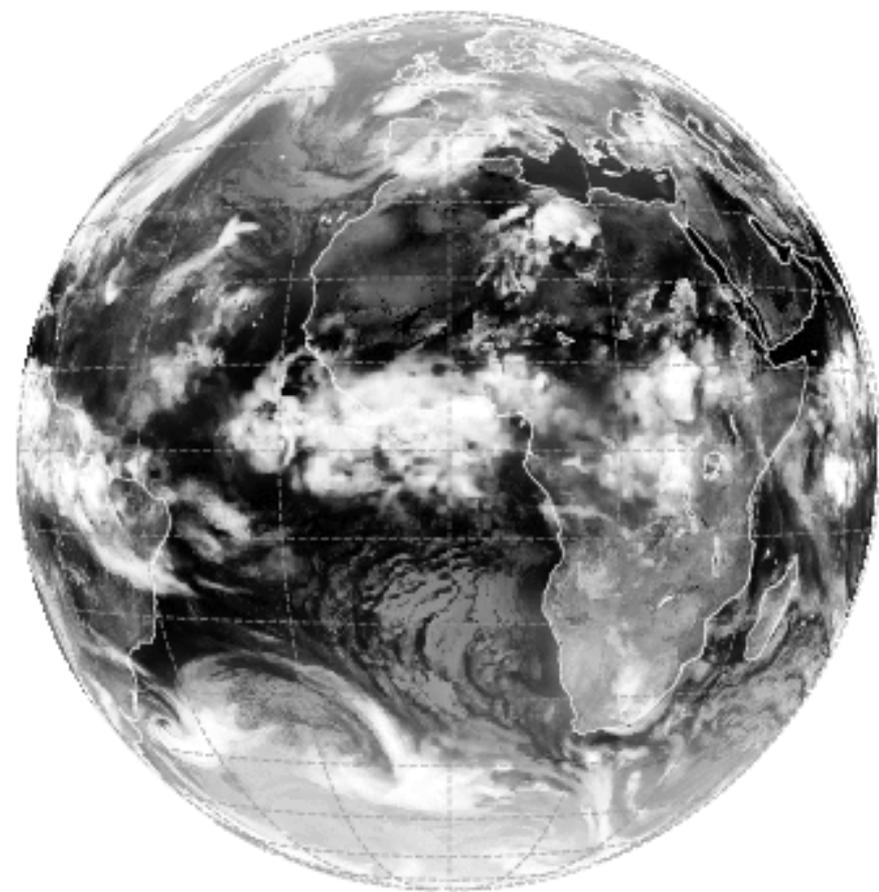
Anomaly correlation of 500hPa height forecasts



Meteosat 9 IR10.8 20080525 0 UTC



ECMWF Fc 20080525 00 UTC+0h:



Seamless Prediction



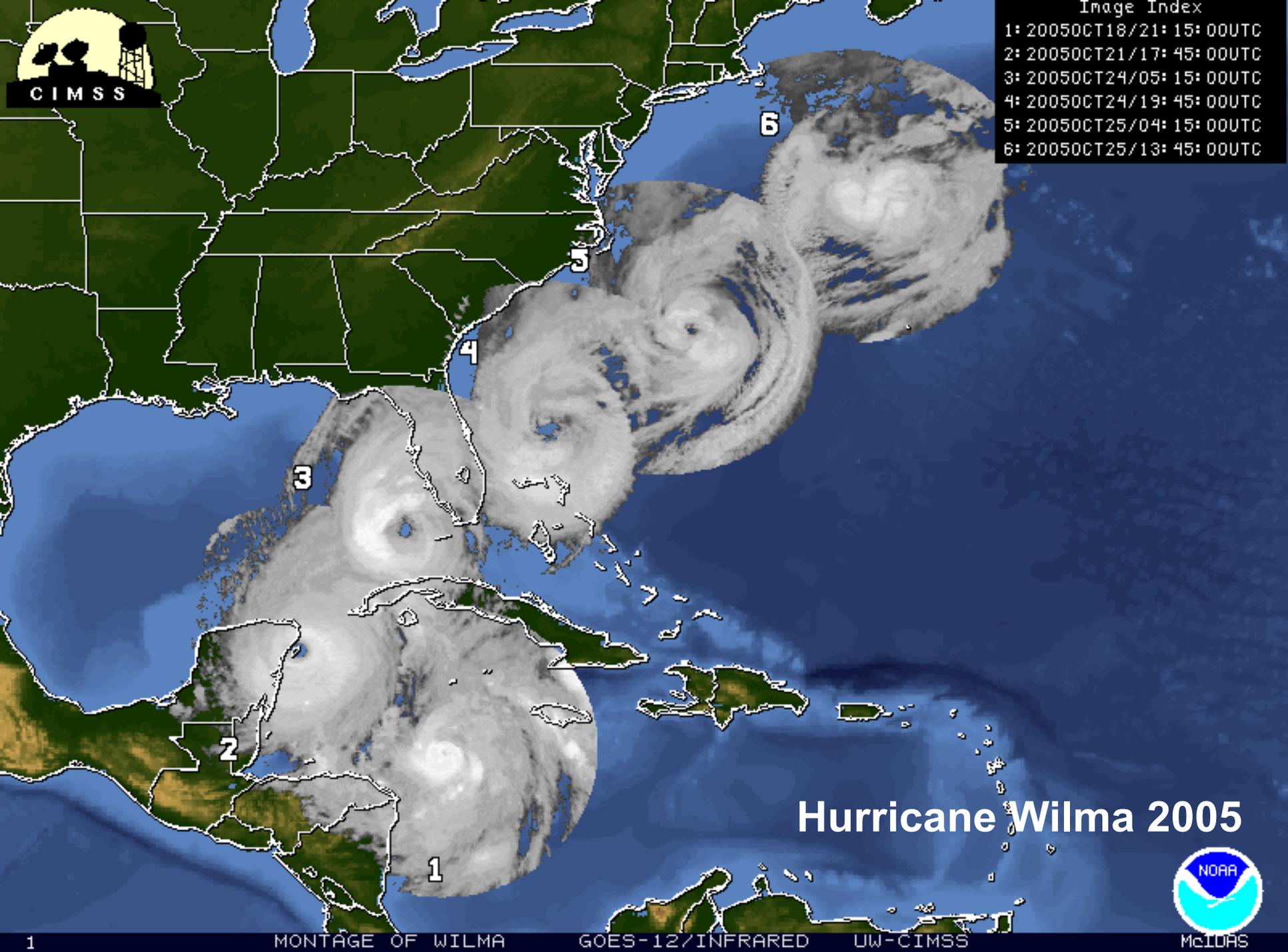
Document 22:

Task CL-07-01 White Paper prepared under Co-Leadership of
WWRP and WCRP



Image Index

1:	2005OCT18/21: 15: 00UTC
2:	2005OCT21/17: 45: 00UTC
3:	2005OCT24/05: 15: 00UTC
4:	2005OCT24/19: 45: 00UTC
5:	2005OCT25/04: 15: 00UTC
6:	2005OCT25/13: 45: 00UTC

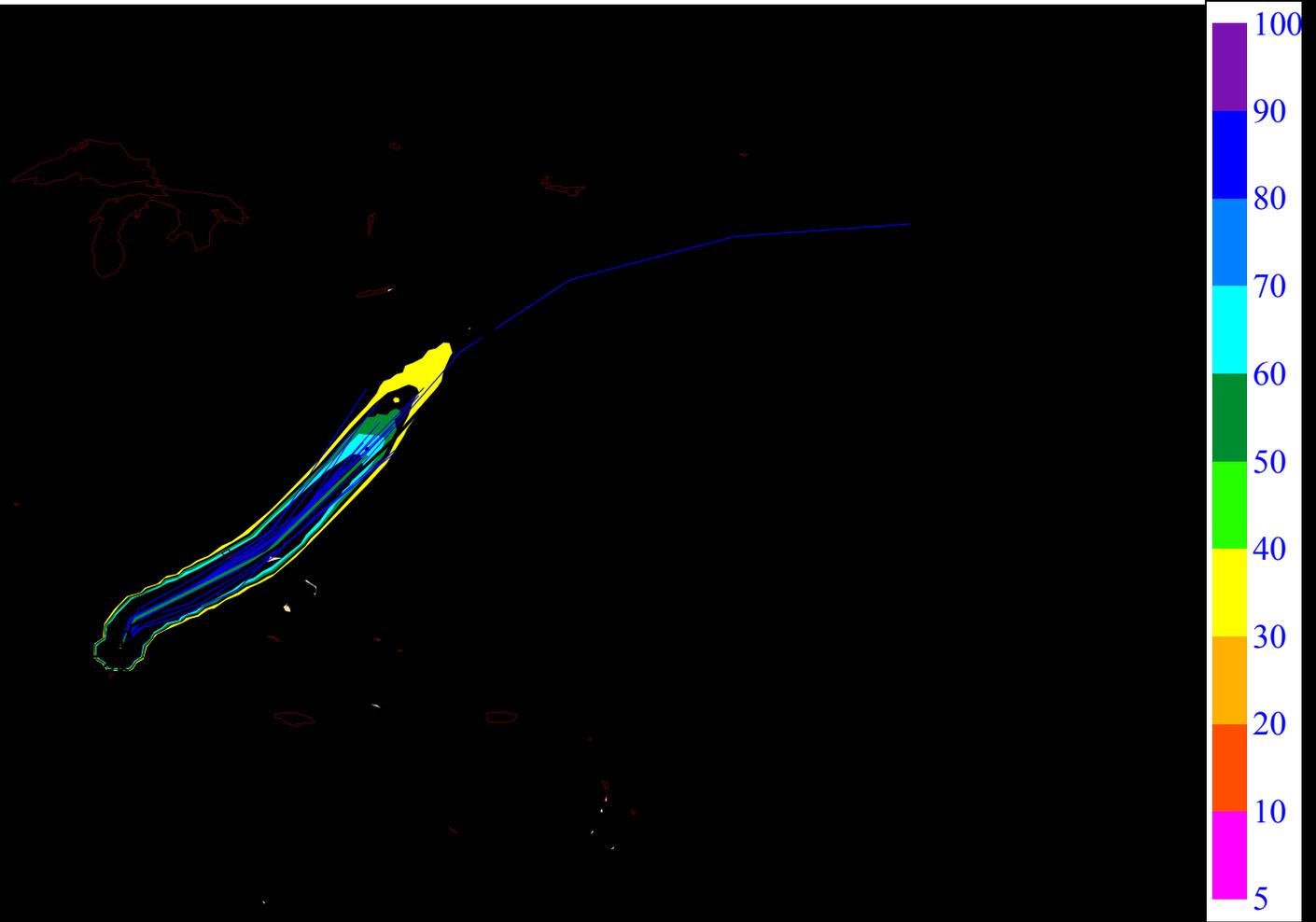


Hurricane Wilma 2005



20051023 12 UTC

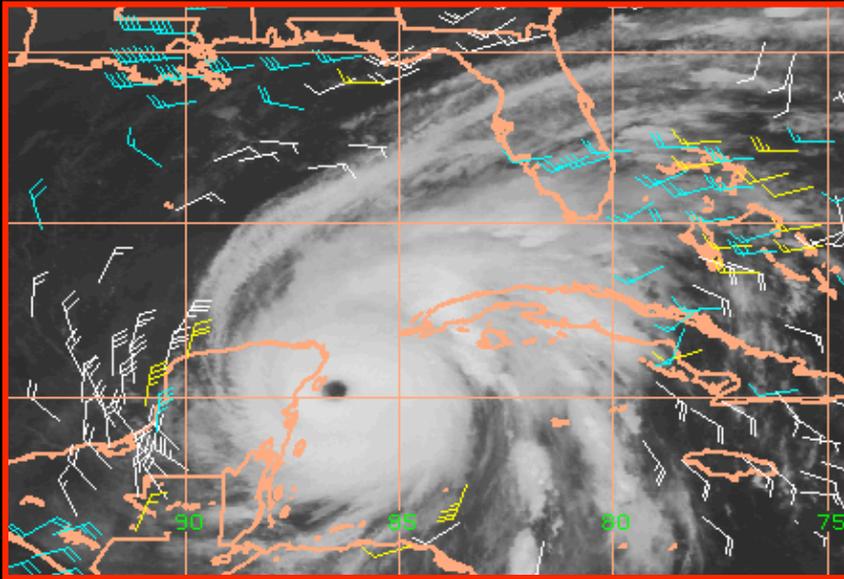
Probability that WILMA will pass within 120km radius during the next 120 hours
tracks: black=OPER, green=CTRL, blue=EPS numbers: observed positions at t+..h



Wilma Hits Florida as Category 3 Storm

Written by [Lesly C. Simmons](#), Staff Writer, Red Cross.org

Monday, October 24, 2005 — ORLANDO



Despite everything the U.S. has seen during this year's hurricane season, and the mandatory evacuation orders issued by state officials, only about 10 percent of residents in the Florida Keys chose to evacuate. "We had law enforcement encouraging people to leave, but unfortunately we cannot make them go," said Irene Toner, director of emergency management for Monroe County, which includes the Florida Keys. "We are very discouraged about the low number of people evacuated."

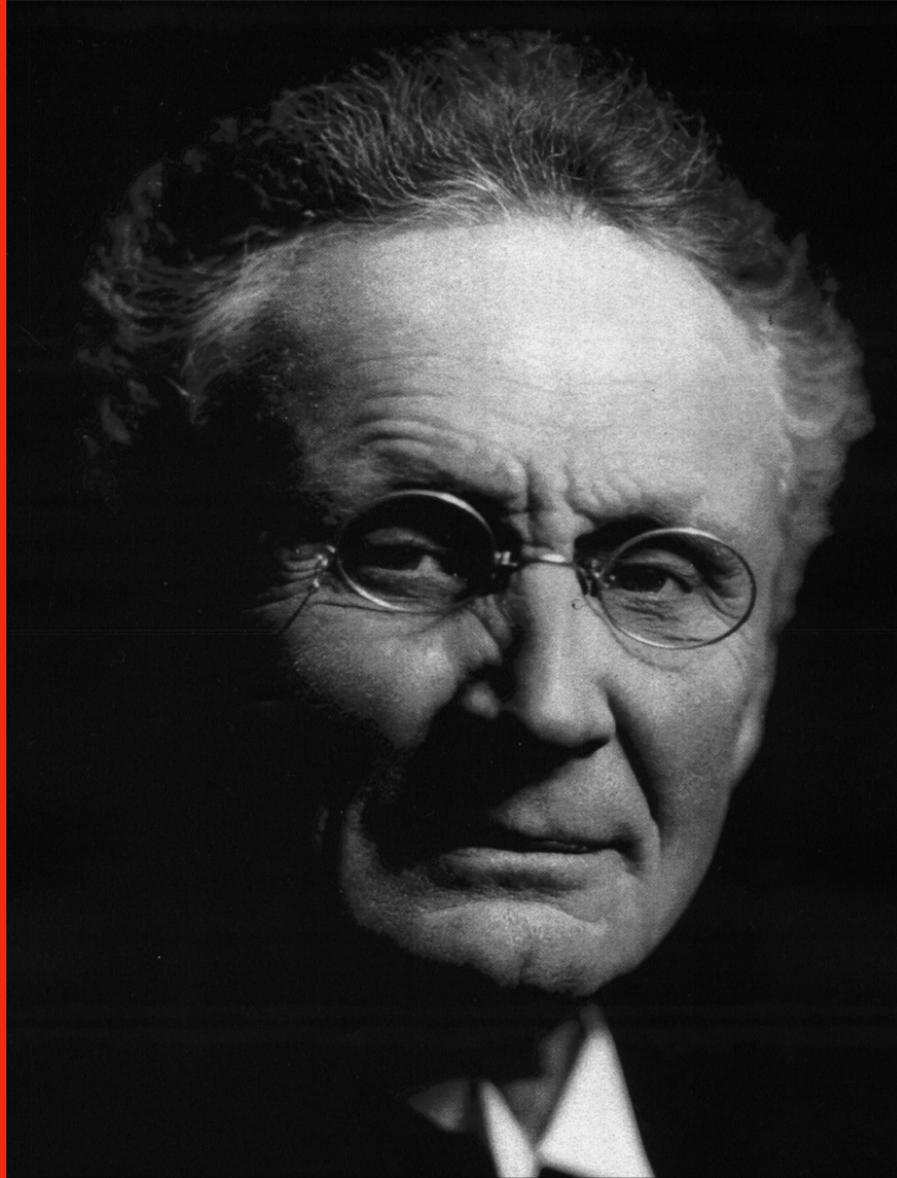
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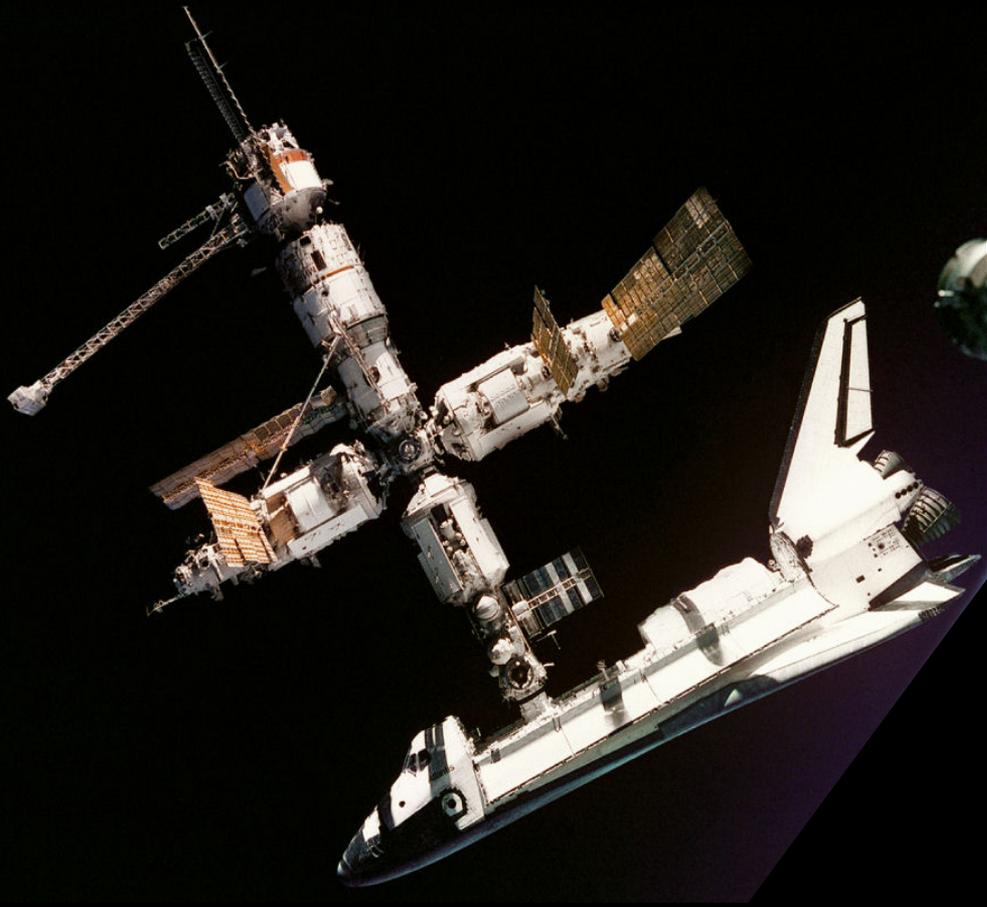
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The scientific and technological expertise to realise quantum advances in monitoring and predicting atmospheric and oceanic circulations and the two-way interactions with the Earth system resides in no one nation. Advancing the skill of weather and climate prediction for a sustainable Earth system is a Global Enterprise for the 21st century and beyond.

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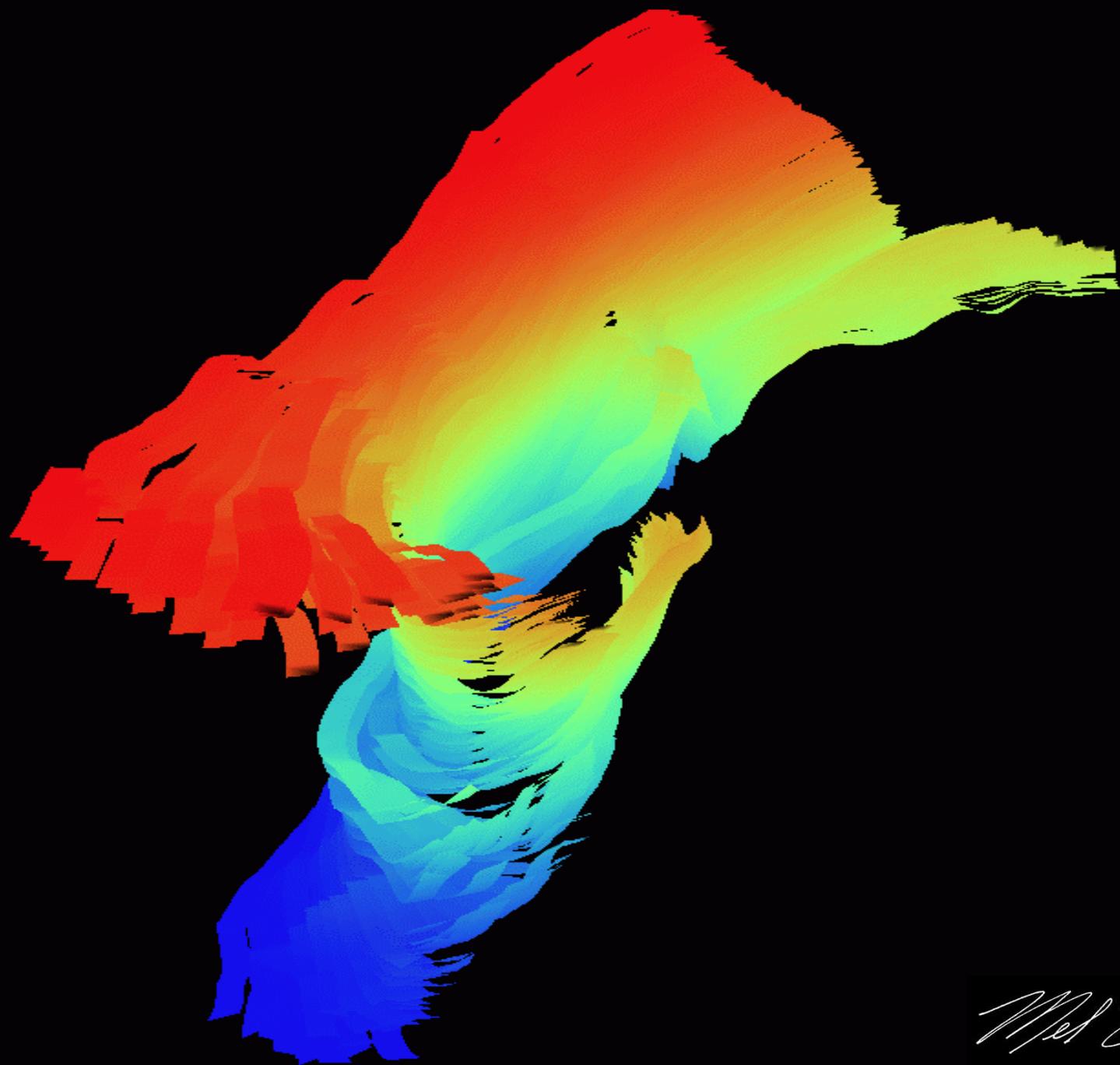


“All mariners steer by the stars knowing that they may never reach them.” *V. Bjerknes, 1933*









Met Shepard