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# North American Regional Climate Change Assessment Program

L. O. Mearns and  
the NARCCAP Team

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National Center for Atmospheric Research

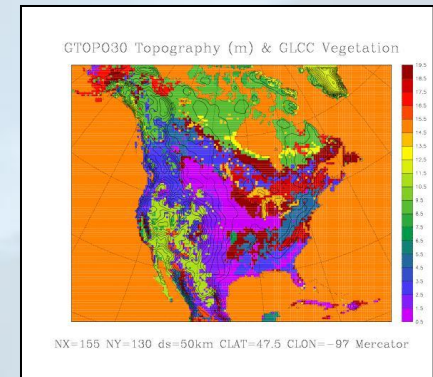
# The North American Regional Climate Change Assessment Program (NARCCAP)



Initiated in FY05, it is an international program that will serve the climate scenario needs of the United States, Canada, and northern Mexico.

Climate scenarios phase starts February 2007.

- Exploration of multiple uncertainties in regional model and global climate model regional projections.
- Development of multiple high resolution regional climate scenarios for use in impacts assessments.
- Further evaluation of regional model performance over North America.
- Exploration of some remaining uncertainties in regional climate modeling (e.g., importance of compatibility of physics in nesting and nested models).
- Program has been funded by NOAA-OGP, NSF, DOE – 3-year program



# NARCCAP - Participants



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# Regional Modeling Strategy

Nested regional modeling technique

- Global model provides:
  - initial conditions – soil moisture, sea surface temperatures, sea ice
  - lateral meteorological conditions (temperature, pressure, humidity) every 6-8 hours.
  - Large scale response to forcing (100s kms)

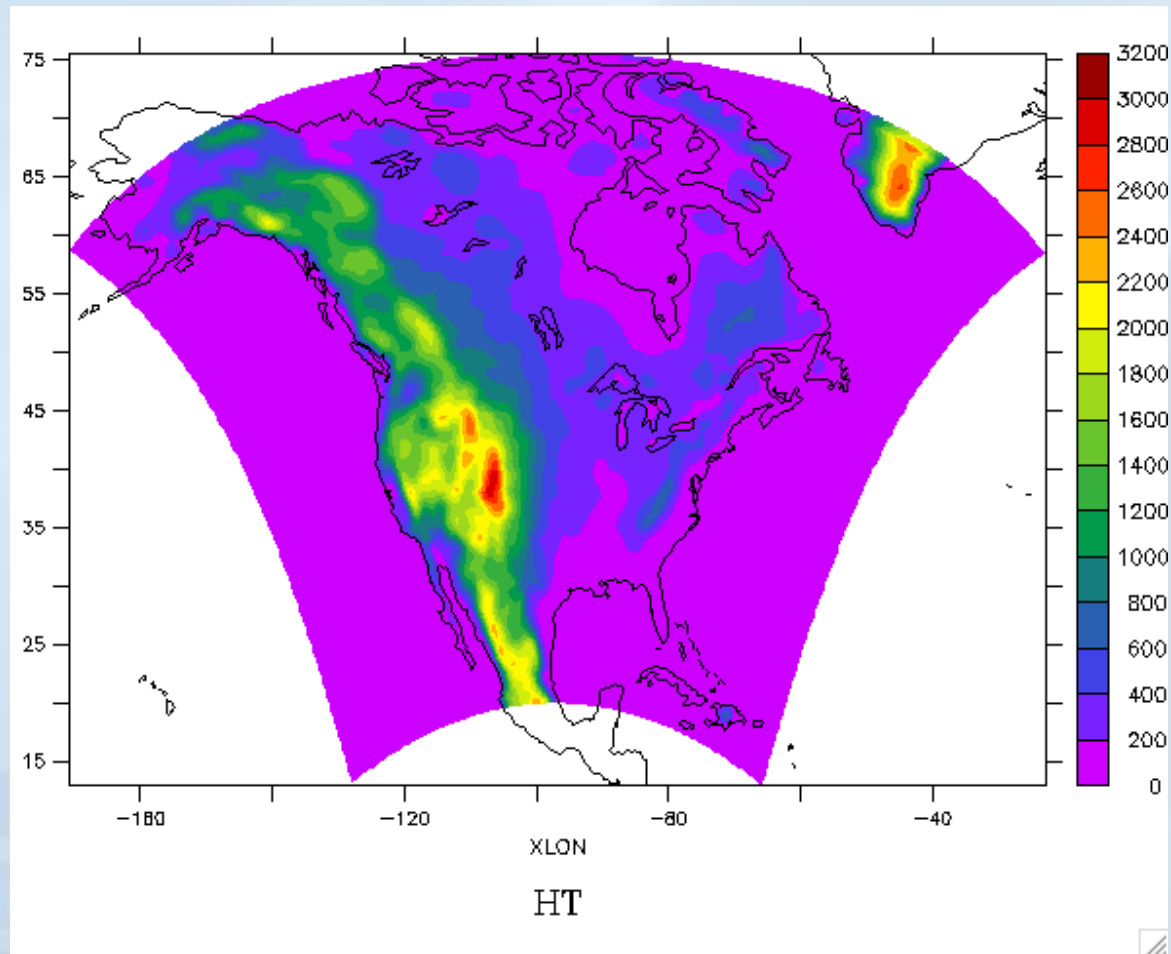
Regional model provides finer scale response (10s kms)



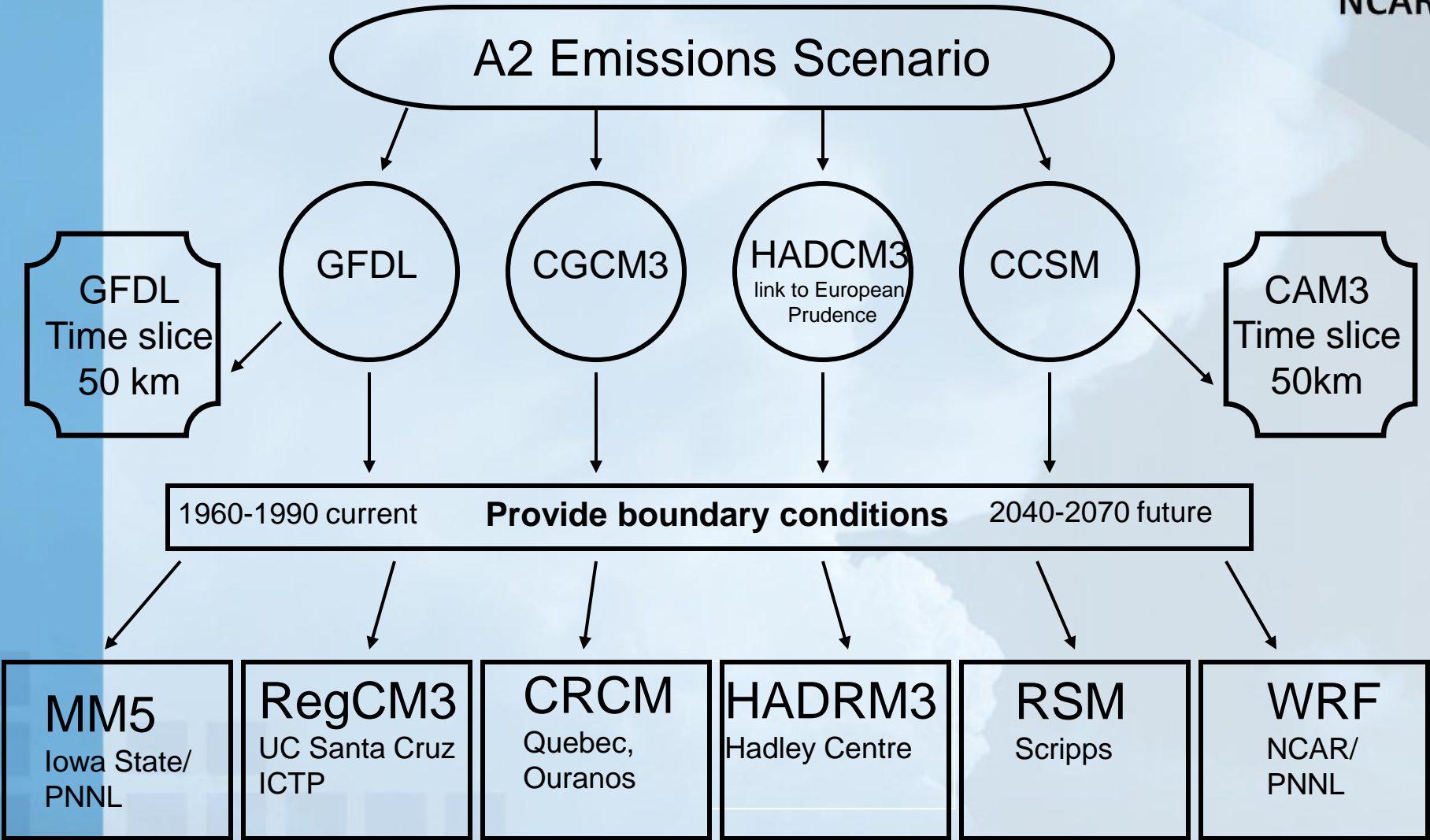
# Physical Contexts for Regional Modeling

- Regions with small irregular land masses (e.g., the Caribbean)
- Complex topography (mountains)
- Complex coastlines (e.g., Italy)
- Heterogeneous landscapes

# NARCCAP Domain



# NARCCAP PLAN





# Organization of Program



- **Phase I: 25-year simulations using NCEP boundary conditions.**
- **Phase IIa: RCM runs (50 km res.) nested in AOGCMs (current and future)**
- **Phase IIb: Time-slice experiments at 50 km res. (GFDL and NCAR CAM3). For comparison with RCM runs.**
- **Opportunity for double nesting (over specific regions) to include participation of other RCM groups (e.g., for NOAA OGP RISAs, CEC, New York Climate and Health Project).**
- **Scenario formation and provision to impacts community led by NCAR.**

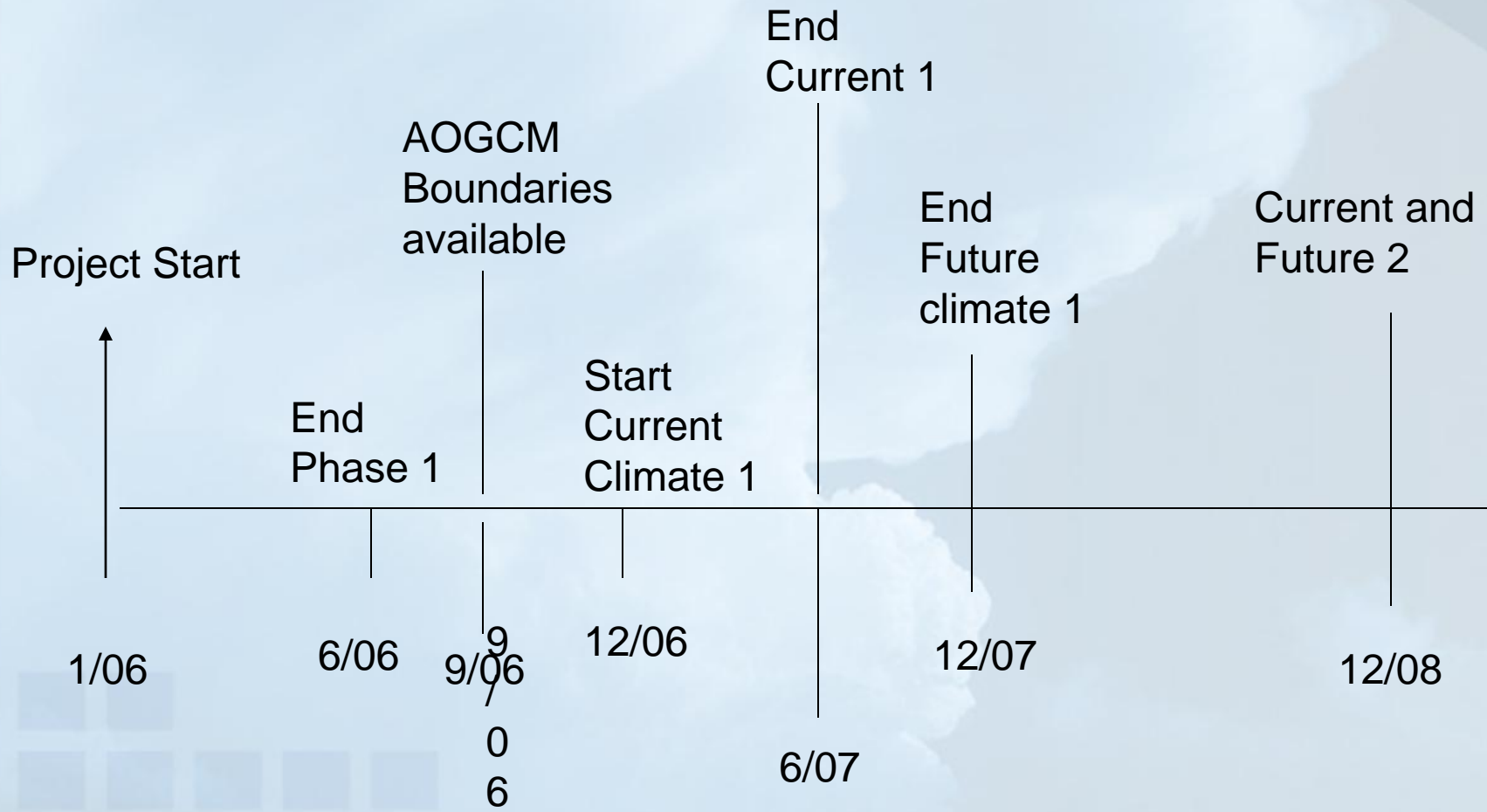


# GCM-RCM Matrix

	GFDL	CGCM3	HADCM3	CCSM
MM5			X	X1
RegCM3	X	X		
CRCM		X1	X	
PRECIS	X	X	X1	X
RSM	X			X1
WRF	X	X		X1
CAM3				X
GFDL/AM2.	X			

1 = chosen first GCM  
N = necessary for factorial design

# NARCCAP Project Timeline



# USERS



- Illinois Water Survey – Ken Kunkel - DS (WRF and MM5)
- CEC - Guido Franco - DS (N. Miller)
- Climate Impacts Group, NASA – Cynthia Rosenzweig – DS – MM5
- Barry Lynn – Columbia U. – DS
- U. North Carolina – Larry Band – impacts (hydrology)
- CLIMAS - Greg Garffin – output (impacts)
- Climate Impacts Group, UW – Ed Miles – impacts, climate analysis, and DS
- Western Water Assessment – Brad Udall – impacts



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