Overview of Draft Strategic Plan

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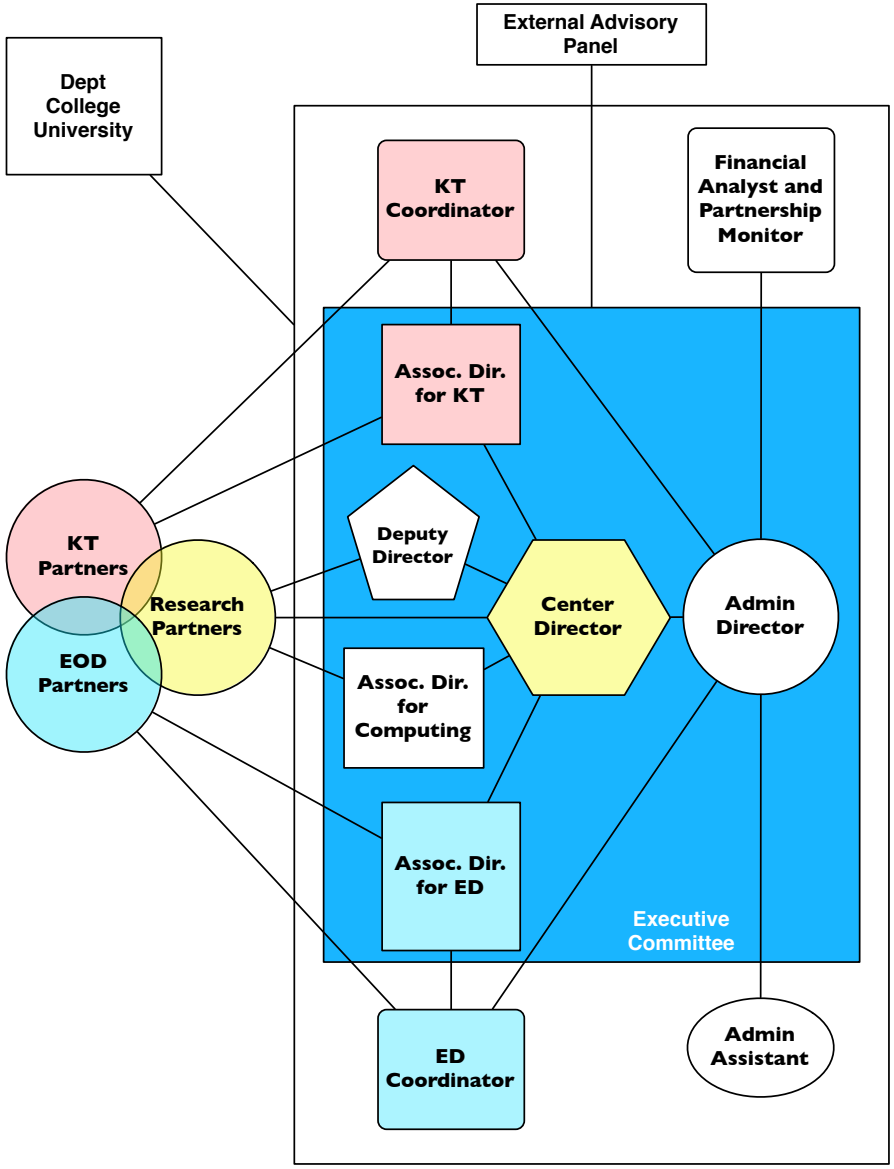
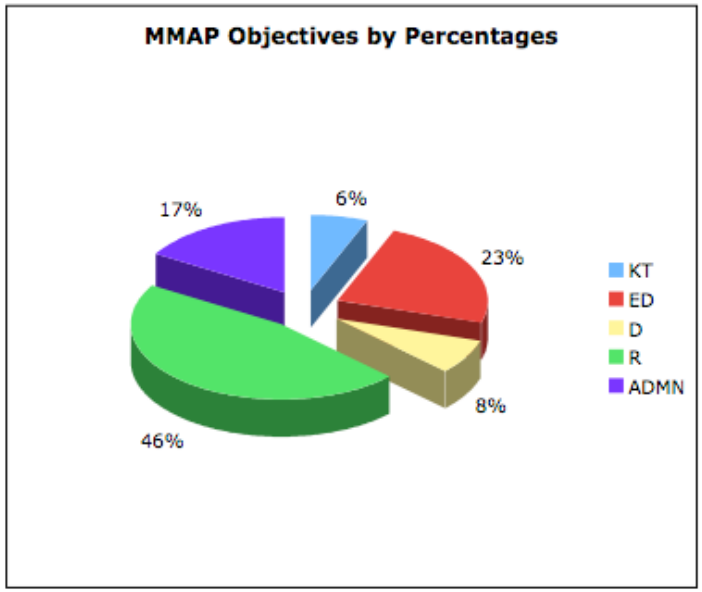
CSU Atmospheric Science

Institution/Organization	Subaward	Partner	Collaborator
University of California, Los Angeles	X	X	
University of California, San Diego	X	X	
Hampton University	X	X	
University of Washington	X	X	
University of Maryland	X	X	
City College of New York	X	X	
University of Utah	X	X	
Colorado College	X	X	
University of Colorado	X	X	
Catamount Institute	X	X	
National Center for Atmospheric Research	X	X	
Pacific Northwest National Laboratory		X	
Lawrence Livermore National Laboratory		X	
Scripps Institution of Oceanography		X	
Frontier Research Center for Global Change, Japan		X	
Center for Climate System Research, University of Tokyo		X	
Bureau of Meteorology Research Center, Australia		X	
Meteorological Service of Canada		X	
European Centre for Medium Range Weather Forecasting			X
Apple Computer	X		X
International Business Machines			X
NASA Goddard Space Flight Center			X
NASA Langley Research Center			X
NOAA Geophysical Fluid Dynamics Laboratory			X
NOAA National Centers for Environmental Prediction			X
University Corporation for Atmospheric Research	X		X
Poudre School District			X
Thompson School District			X


External Advisory Panel
Dept College University
KT Coordinator
Financial Analyst and Partnership Monitor
Assoc. Dir. for KT
Deputy Director
KT Partners
Research Partners
EOD Partners
Center Director
Admin Director
Assoc. Dir. for Computing
Assoc. Dir. for ED
Executive Committee
ED Coordinator
Admin Assistant


MMAP Objectives by Percentages
6%
23%
8%
46%
17%
KT
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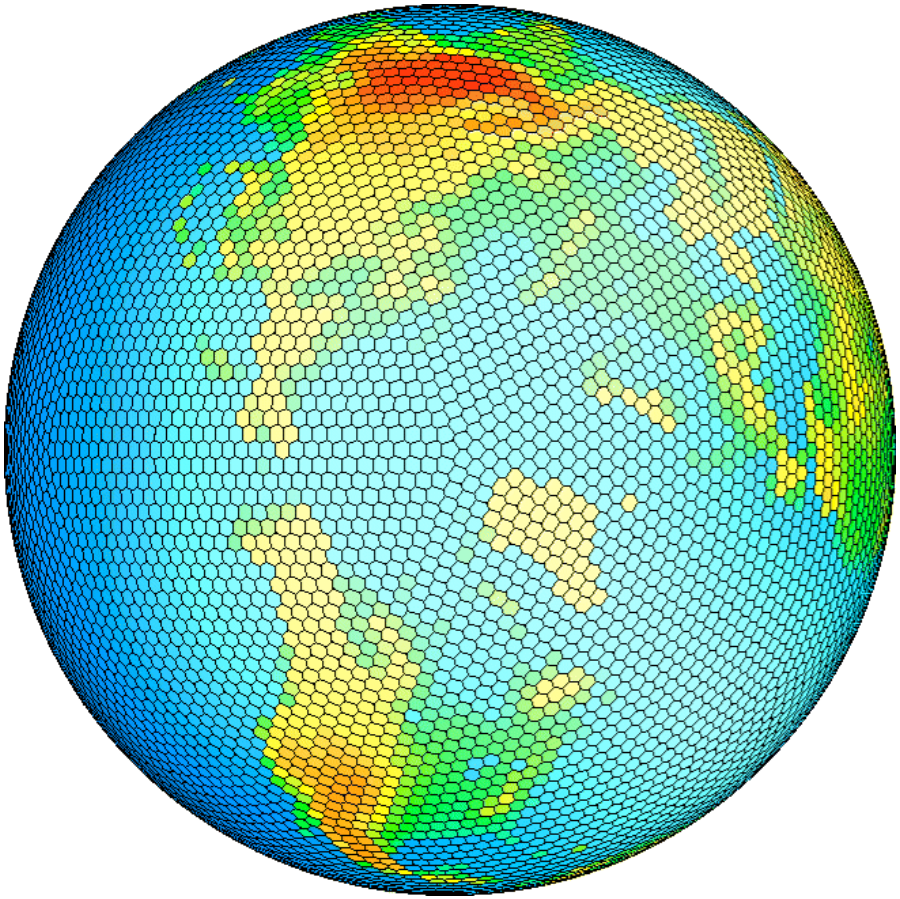
Research



1. Vision Statement for Research

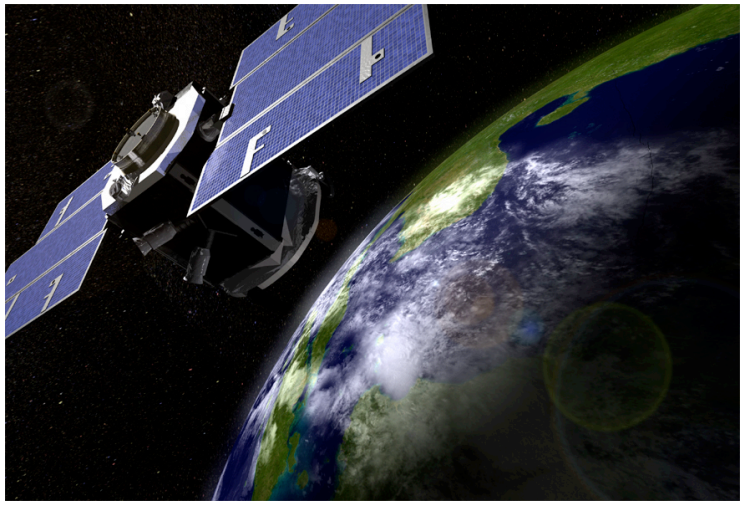
To understand and predict the effects of clouds on a wide range of Earth-system processes.

2. Mission Statement for Research

The research mission of MMAP is to develop a new kind of global atmospheric model that can represent the effects of clouds on weather and climate with greatly improved realism; to evaluate the new model by comparison of model results with observations; and to apply the model to understand the interactions of clouds with other components of the Earth system, including the atmosphere, the vegetated land surface, and the oceans.

Objective	Action Steps	Responsible Person & Team	Location	Time-frame
Extensions, evaluations and applications of the prototype MMF	Perform and analyze AMIP simulations with the prototype MMF	Khairoutdinov DeMott Ackerman	CSU CSU PNNL	Year 1
	Perform and analyze coupled ocean-atmosphere simulations with the prototype MMF	Khairoutdinov	CSU	Year 2
	Create and test a geodesic version of the prototype MMF	Dazlich Khairoutdinov	CSU CSU	Year 2
Development of a second-generation MMF	Develop and test Quasi-3D MMF	Arakawa Jung Konor	UCLA CSU CSU	Year 3
	Develop and test a global cloud-resolving model	Arakawa Jung Konor Khairoutdinov	UCLA CSU CSU CSU	Year 3
Development of improved parameterizations for use in the MMF	Develop and test improved microphysics parameterization for CSRMs	Grabowski Bretherton Kreidenweis Tao Krueger Heymsfield	NCAR UW CSU GSFC UU NCAR	Ongoing
	Develop improved turbulence parameterizations for use in CSRMs	Moeng Lappen Stevens	NCAR CSU UCLA	Ongoing
	Test sensitivity of CSRMs to more detailed radiation calculations	Barker Collins Stephens	AES NCAR CSU	Ongoing

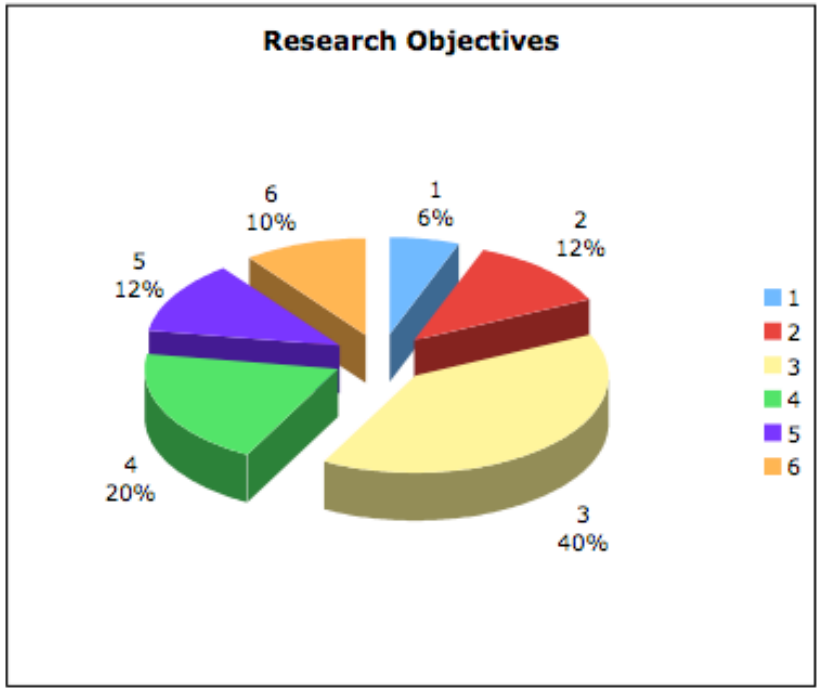
An Amazing Convergence



MMAP

Reach for the sky.

Objective	Action Steps	Responsible Person & Team	Location	Time-frame
The evaluation and interpretation of MMF results using emerging datasets	Acquire and adapt in situ datasets for use in evaluating the MMF	Ackerman Heymsfield	PNNL NCAR	Ongoing
	Acquire and adapt satellite datasets for use in evaluating the MMF	Stephens Rossow Kummerow	CSU CCNY CSU	Ongoing
Continuing development of conventional parameterizations	Cumulus convection	Randall Hack	CSU NCAR	Ongoing
	Stratiform clouds	Randall	CSU	Ongoing
	Boundary layer	Lappen Randall Bretherton	CSU CSU UW	Ongoing
Optimal use of computational and data storage resources	Port the MMF and GCRM to a variety of computing platforms	Helly Khairoutdinov Dazlich	UCSD CSU CSU	Ongoing
	Efficiently distribute model output and observational datasets to users	Helly	UCSD	Ongoing


Research Objectives
1
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Education

Vision Statement for Education

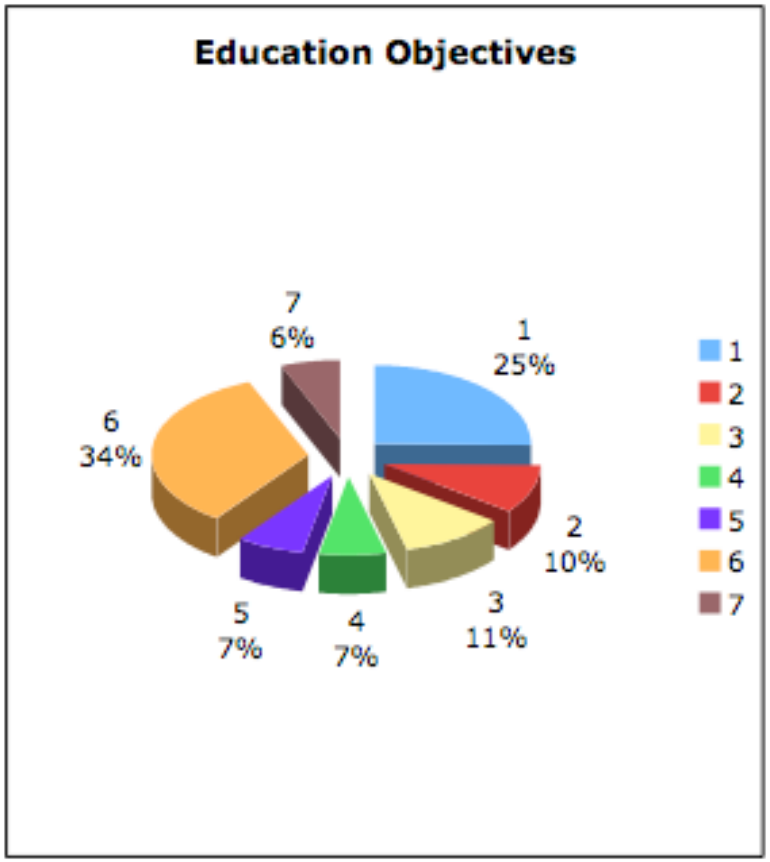
Enhance the climate science workforce of the nation by inspiring and educating students of all levels, policymakers, and the public about climate science.

Mission Statement for Education

Educate and train a diverse population in climate and Earth System Science by enhancing teaching and learning at all educational levels, disseminating science results through multiple media, engaging stakeholders and policymakers, and improving science pedagogy.

Objective	Action Steps	Responsible Person & Team	Location	Time-frame
Develop, implement, disseminate and evaluate improved Earth System Science curricula for middle and junior high schools	Develop and test curriculum enhancement kits for local schools	Jones	CSU	Ongoing
	Develop climate content for LSOP & TV show	Jones Denning	CSU CSU	Ongoing
	Teacher training course	Jones TIR	CSU PSD, TVS	Ongoing
	Evaluation/assessment	Lacy	CSU	Ongoing
Improved climate education at high school level	SEE-ME web-based modeling tools Teacher training course UCAR levelizers Classroom evaluation Formal assessment Climate summer program, Catamount	Denning Foster ED coord Lacy Drossman	UCAR PSD Schools CSU Catamount Institute	Ongoing
Dissemination of MMAP science to public via web	Windows to the Universe web site Science communication analysis	Foster Denning ED coord Russell Jones Canetto	UCAR CSU	Ongoing

Objective	Action Steps	Responsible Person & Team	Location	Time-frame
Outreach to climate stakeholders & policymakers	Climate white papers for stakeholders Summer workshops Short course on policy for MMAP grad students	Kathlene Denning ED coord Foster	CIPP UCAR	Ongoing
Improved undergraduate climate education	New climate courses Minority recruiting and retention	Denning Drossman ED coord El-Hakim	CC Regional institutions (CO-AMP)	Ongoing
Graduate education and research	Recruiting excellent and diverse students Improved climate coursework Direct involvement with research	Denning MMAP faculty ED coord	All institutional partners	Ongoing
Teaching future teachers	Teacher training course Mentoring interactions LSOP internships	Denning ED coord Stevens Jones	CSU PSD Schools MMAP partners	Ongoing


Education Objectives
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25%
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7

Diversity

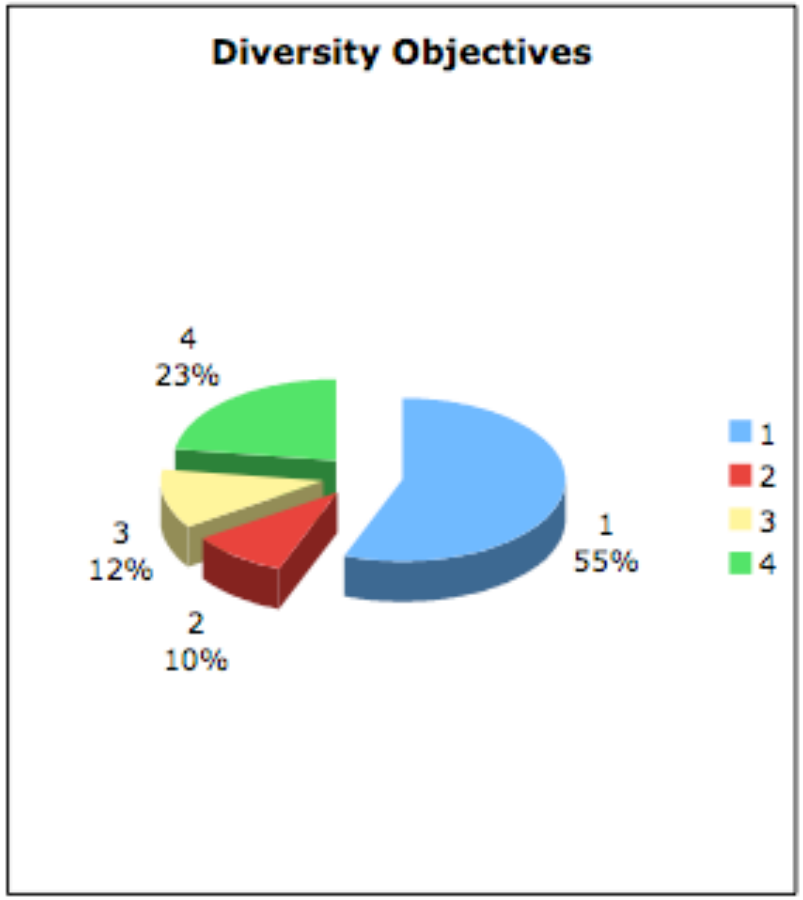
Vision Statement for Diversity

Enhance the climate science workforce of the future, by drawing on the diversity of culture and life experience of the whole US population.

Mission Statement for Diversity

Increase the number of women and underrepresented minorities in climate science by aggressively recruiting these groups as MMAP grad students, helping them become excellent scientists and educators, and placing them in leadership faculty positions. Enhance the science and engineering pipeline through mentoring and recruiting at earlier academic levels. Study diversity problems and solutions, and disseminate results.

Objective	Action Steps	Responsible Person & Team	Location	Time-frame
Recruit and matriculate representative Ph.D. students from MMAP	2 Ph.D. students at HU	Denning ED coord	HU	Ongoing
	2 grad students and 3 summer interns per year through SOARS	Pandja	UCAR	Ongoing
	3 summer internships for HU undergrads	El-Hakim	HU	Ongoing
	2 CSU minority scholarships in ATS		CSU	Ongoing
Improved recruitment of ethnic minorities to undergraduate science and engineering programs	Present climate science to 400 minority high school students per year through CO-AMP and Drossman	Denning ED coord El-Hakim Drossman	CSU CSU CSU Catamount Institute	Ongoing
Better retention of women in the science pipeline	Mentoring program pairing female ATS grad students with female high-school students	Denning ED coord	CSU CSU	Ongoing
	Women in LSOP	Jones Canetto	CSU CSU	Ongoing
Study diversity problems and solutions, and disseminate results	Study of media portrayal of gender in science Longitudinal study of women in science careers Assessment of McNair mentoring program	Denning Canetto McPhee ED coord	CSU CSU CSU CSU	Ongoing


Diversity Objectives
4
23%
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12%
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1
55%
1
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4

Knowledge Transfer

Vision Statement for Knowledge Transfer

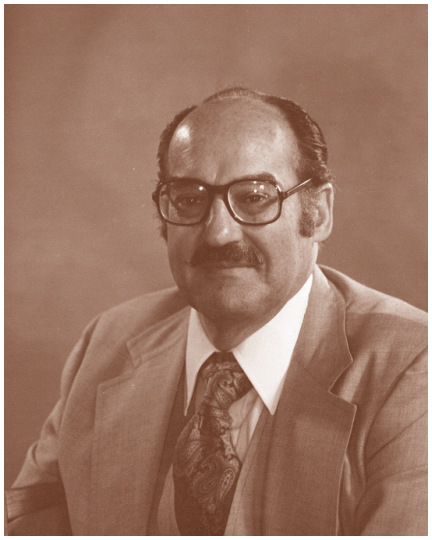
To serve as an internationally recognized resource for research and education in climate simulation, numerical weather prediction, and scientific publications dealing with global environmental modeling.

Mission Statement for Knowledge Transfer

MMAP will engage in two-way knowledge transfer that benefits the Center, the public , and the academic and research communities. This will occur through the transfer of modeling technology to other modeling centers, and through the creation of new publications channels for work on global environmental modeling.

Objective	Action Steps	Responsible Person & Team	Location	Time-frame
Provide improved tools for the simulation of global cloudiness to climate modeling centers.	Make prototype MMF available to climate modeling centers	Khairoutdinov Collins Donner	CSU NCAR GFDL	Year 1
	Make improved conventional parameterizations available to climate modeling centers	Khairoutdinov Collins Donner	CSU NCAR GFDL	Year 3
Provide improved cloud parameterizations to numerical weather prediction centers.	Make prototype MMF available to numerical weather prediction centers	Khairoutdinov Lord Miller	CSU NCEP ECMWF	Year 1
	Make improved conventional parameterizations available to numerical weather prediction centers	Khairoutdinov Lord Miller	CSU NCEP ECMWF	Year 3

Objective	Action Steps	Responsible Person & Team	Location	Time-frame
Create an edited book on the history of global atmospheric modeling.	Recruit chapter authors	Randall Schubert Donner	CSU CSU GFDL	Year 1
	Interview modelers	Randall Schubert Donner	CSU CSU GFDL	Years 1-3
	Choose publisher	Randall Schubert Donner	CSU CSU GFDL	Year 2
	Deliver manuscript to publisher	Randall Schubert Donner	CSU CSU GFDL	Year 4



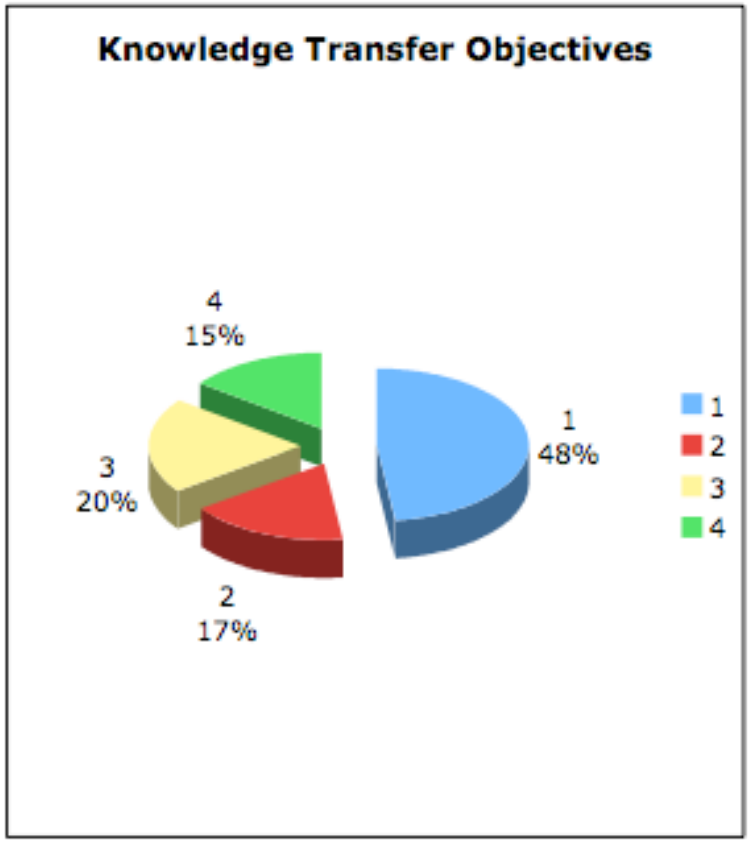
Objective	Action Steps	Responsible Person & Team	Location	Time-frame
Create a new all-electronic open-access journal for the publication of research on global environmental modeling.	Creation of a business plan for the journal	Schubert Randall KT manager	CSU CSU CSU	Year 1
	Exploration of possible affiliations, e.g., PLoS	Schubert Randall KT manager	CSU CSU CSU	Year 1
	Development of a plan for the submission-to-publication process	Schubert Randall KT manager	CSU CSU CSU	Year 1
	Solicitation of contributions	Schubert Randall KT manager	CSU CSU CSU	Year 2
	Development of a plan for publicizing the new journal	Schubert Randall KT manager	CSU CSU CSU	Year 2
	Begin publication	Schubert Randall KT manager	CSU CSU CSU	Year 3

Open Access Journals: SPARC

- Scholarly Publishing & Academic Resources Coalition
- Activities:
  - promotional initiatives
  - high quality low cost alternative journals
- Achievements:
  - price reductions
  - academic quality
  - editorial board defections

Open Access Journals: Public Library of Science

- Organisation of scientists worldwide
- Open letter signed by 30,000+ scientists from 180+ countries
- "…committed to making the world's scientific and medical literature freely accessible to scientists and to the public around the world."


Knowledge Transfer Objectives
4
15%
1
48%
3
20%
2
17%
1
2
3
4

Cohesion of the Center

- **The research activities of MMAP will be organized around the central activities of model development, model evaluation, and the use of the models to improve our understanding of the Earth system.**
- **MMAP's graduate education and diversity activities are by their nature highly integrated with the research work. Undergraduate and K-12 educational and diversity activities will be organized as "feeders" of future MMAP scientists.**
- **MMAP's knowledge-transfer activities are focused on model applications and publications, both of which are natural extensions of MMAP's research.**
- **To foster communication, we plan two MMAP meetings per year, each lasting two or three days.**
- **Scientific visitors will be hosted at MMAP Headquarters at Colorado State University. Student interns and teachers undergoing training will also be in residence at CSU.**
- **In addition, we have budgeted in the first year for an "Access Grid" teleconferencing system.**

Appendices

- Data Management Plan
  - MMAP's modeling work will produce petabytes per year
  - MMAP will also make use of large volumes of observational data
- Intellectual Property Policy
- Ethics Policy