

Memorandum of Agreement

This is a Memorandum of Agreement between the Puget Sound Clean Air Agency (PSCAA) and the University of Washington (UW), also referred to as the parties, for the development and implementation of a coordinated mesoscale meteorological prediction system located at the University of Washington within the Department of Atmospheric Sciences (DAS), to facilitate ongoing meteorological and air quality forecasting programs for PSCAA. This Agreement is intended to provide access to operational meteorological products and data. This Agreement is also intended to provide access to scientific experts for independent peer review and guidance of PSCAA projects and new product development, to support the exchange of research findings between both parties, and to provide access for students and faculty within DAS to air monitoring data and expertise within PSCAA.

This Agreement expresses the agreement and common understanding of the aims and goals of the parties in the area of mesoscale meteorological prediction, and describes the key considerations and operating guidelines agreed upon by the parties.

The parties agree to the following terms and conditions:

- 1. *Scope of work.*** The specific details of work to be completed by the parties and funding agreements for this work will be set forth in a separate scope of work, known as Attachment A, agreed to by the parties. Attachment A and revisions thereto, are hereby incorporated into this Agreement. Attachment A will be updated as needed, and at least annually.
- 2. *Facility operational requirements.*** UW-DAS will develop a list of the operational requirements for the facility that will serve the needs of the parties involved, and support the goals of PSCAA.
- 3. *Site location and administration.*** The mesoscale prediction facility will be located within UW-DAS at a site selected for the convenience of the parties and with the capacity to meet mutual operational requirements. The facility shall be operated under the supervision of a facility director appointed by the UW-DAS chair.
- 4. *Cost sharing.*** In return for ongoing involvement and funding support of DAS-mesoscale modeling system activities by PSCAA, the UW agrees to a fixed indirect cost rate of 25% for all activities and non-equipment related budget items.
- 5. *Quality control.*** The UW-DAS will develop a quality control plan for the facility to meet UW-DAS and PSCAA goals and requirements. UW-DAS will develop, maintain and improve a performance verification system to show model skill and support future improvements and research needs.
- 6. *Activities.*** Attachment A shall include the following elements: a statement of work listing specific products and objectives for the mesoscale prediction system and facility during the

funding period; a detailed budget describing personnel time, student support, benefits, equipment, and supplies needed to achieve these specific aims; a budget justification; and a time table for expected tasks and activities.

7. **Material tracking.** The UW will maintain a written record of incoming and outgoing equipment and non-expendable items such as instruments, computers and software (costing over \$2,000 each) purchased with PSCAA funds for this project and make this record available to PSCAA upon request. Ownership of such items will vest in the University of Washington. These items will be used for the work covered by this Agreement as long as the Memorandum of Agreement is in effect.
8. **Efficient data exchange.** The UW-DAS and PSCAA agree that sharing and transfer of data from the facility's activities is desirable and necessary for both parties. Upon request, each party shall provide copies of data collected in electronic form to the other party in a timely manner. When necessary, a written data-sharing plan for specific tasks shall be specified in Attachment A to facilitate PSCAA operations.
9. **Communications program.** The UW-DAS and PSCAA agree that they have a significant mutual interest in communicating facility activities with the public. The parties agree to work together to produce an annual report describing these activities, to document products such as scientific papers, reports, abstracts, posters, presentations or other summaries, and to make recommendations for workshops, education materials, staff training or other educational tools that would enhance the effectiveness of the mesoscale modeling facility and support the PSCAA mission. The report shall be complete by June 15, 2008.
10. **Term.** The term of this Agreement, upon signature of the Agreement by both parties, shall have a start date of March 15, 2008 and will terminate on February 28, 2013.
11. **Notices.** All notices hereunder may be delivered by mail or e-mail, and shall be sent to the following addresses:

PSCAA:

Mike Gilroy, Manager, Technical Services
Puget Sound Clean Air Agency
1905 3rd Ave
Seattle, WA 98101
206 689 4001
Email: mikeg@psccleanair.org

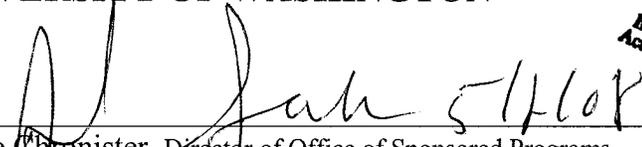
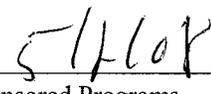
UW:

Clifford Mass, Principal Investigator
Department of Atmospheric Sciences
University of Washington, Box 351640
206 685 0910
Seattle, WA 98195-1640
Email: cliff@u.washington.edu

- 12. **Amendments.** This Agreement may be amended or modified only by written agreement of the parties.
- 13. **Applicable law.** This Agreement shall be governed by the laws of the state of Washington.
- 14. **Entire agreement.** This Agreement contains the entire agreement of the parties hereto and no representations, inducements, promises or agreements, oral or otherwise, between the parties not embodied herein shall be of any force or effect.
- 15. **Hold harmless/indemnification.** To the extent legally permitted, each party shall indemnify and hold harmless the other party from and against any and all claims, actions, damages, liability, and expense, including, without limitation, reasonable attorney's fees incurred as a result of such party's actions under this Agreement; provided that, if such claims, actions, damages, liability, or expense arise from concurrent negligence of the parties, including instances where this Agreement is subject to the provisions of RCW 4.24.115, then the obligation to indemnify under this Agreement shall be effective only to the extent of each party's own negligence. No party shall be required under this section to indemnify another for its sole negligence.

On the date indicated below next to their signatures, the undersigned have executed this Agreement on behalf of the parties hereto.

UNIVERSITY OF WASHINGTON

Lynne Chronister, Director of Office of Sponsored Programs Date
 University of Washington, Office of Sponsored Projects

Joel Serres
 Interim Associate Director
 Acting for Lynne Chronister

Cliff Mass 4/11/08
Clifford Mass, Facility Director Date
University of Washington (UW)

Kathryn Stout 2 Apr 08
Kathryn Stout for Dale Durran, Chair Date
University of Washington, Department of Atmospheric Sciences

Vicky Palm 4/7/08
Vicky Palm, Director of Grants & Contracts in the Dean's Office Date
University of Washington, College of Arts & Sciences

PUGET SOUND CLEAN AIR AGENCY

Dennis McLerran 5/20/08
Dennis McLerran, Executive Director, PSCAA Date

Paul Roberts 6/02/08
Paul Roberts, Chair, Board of Directors, PSCAA Date

Attachment A

Project Title: Mesoscale Meteorological Prediction System

Short title: WRF/MESOSCALE

Project PI: Clifford F. Mass

The terms of this performance period begin March 15, 2008 and end June 30th 2008.

1. **Services- Continuing**

UW-DAS shall provide the following services:

Provide a suite of meteorological analyses and forecast products to PSCAA created from twice daily, operational runs using the current and future regional versions of the University Of Washington, Mesoscale Environmental Prediction System (formally MM5)

Provide and maintain a website for accessing all products and data resulting from the project.

Create twice-daily (0000Z/1200Z) forecast, skew-t diagrams, and Meteograms and time-height cross-section graphic products valid at 3-hour increments from initialization through 72 hours. These products will be for both the 12 and 4-km (through 72-h) domain. Add additional sites as provided by PSCAA.

Provide a suite of air quality relevant forecast products for predicted ventilation.

Provide a limited suite of air quality and meteorological extended forecast products through hour 180 from run initialization.

Develop map backgrounds for the Puget Sound region to improve public display of products.

Make improvements in hardware and the modeling system to enhance forecast skill and product availability.

Services- New

The UW-DAS will provide the following services:

Implement new algorithms to correct RASS and Profiler Data from the system operated by PSCAA on the NOAA campus at Sand Point. Improve the profiler and RASS displays and archive corrected data resulting in a Climatological data base. This shall be complete by June 15, 2008.

Create a database archive of ventilation forecasts outputs for 3, 12 hour and 24 hours valid times. This shall be complete by May 15, 2008.

Create an “air quality” meteogram and designed by PSCAA and provide this new product online. This shall be complete by May 15, 2008.

Provide written report of work progress, model developments and budgetary information to Project Manager at conclusion of this performance period. This shall be complete by June 30, 2008.

Budget Justification

The budget for this project is predominantly for personnel that will be completing the specified tasks. Professor Clifford Mass will supervise the effort. Phil Regulski and David Baars are responsible for creating the required products and graphics. Dave Ovens is tasked with running the critical modeling systems and for making model grids available to the others. Andrew Sattler is responsible for financial management and ordering necessary supplies and hardware.

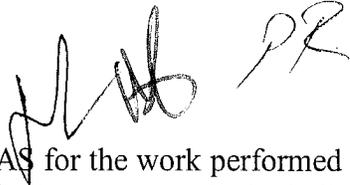
Detailed Budget

Start: 3/15/2008
End: 6/30/2008

			Year 1
Salaries:	Monthly	Mos.	
Mass	12,590	0.25	3,148
Regulski	4,492	1.05	4,696
Baars	5,404	0.5	2,702
Ovens	6,472	0.25	1,618
Sattler	3,744	0.1	374
	Salaries		12,538
	Benefits		3,461
	Services		0
	Travel		0
	Supplies		0
	MTDC		16,000
	Equipment		0
	Tuition		0
	Total Direct Costs		16,000

Indirect Costs (25.0% on MTDC)	4,000
TOTALS	20,000

Compensation



The Agency shall pay the UW-DAS for the work performed to accomplish the tasks and products contained in this Attachment A in the amount which shall not exceed \$20,000. The UW-DAS shall invoice the Agency quarterly. The UW-DAS shall submit invoices to the Manager of Finance and Purchasing. Invoices shall be paid within thirty (30) days after review and approval of the Project Manager. Invoices submitted by the UW-DAS should show time and material information. Charges should be broken down by the hour showing task and/or subtask performed, name of the person who performed the work, cost per hour and specific number of hours spent within a given billing period (quarterly). The final invoice must be submitted no later than ten (10) working days after the end of the performance period for Attachment A.