NW-AIRQUEST Annual Workplan Update

NW-AIRQUEST ANNUAL MEETING

8 JUNE 2021

VON P. WALDEN AND JOE VAUGHAN

FOR LAR/CEE/VCEA/WSU

New Personnel

Amin Vahidi – new postdoc

UNOFFICIAL – STILL IN THE HIRING PROCESS…

EDUCATION

- Ph.D., Environmental Engineering, 07/2020
  University of Tehran, Tehran, Iran
  Supervisors: Dr. Khosro Ashrafi, Dr. Majid Shafiepour Motlagh
  Dissertation: Analysis of Dispersion, Wet-Dry Deposition and Interactions of Mercury in Air of Tehran city Using Modeling
  GPA: 16.56/20.00

- Visiting Scholar, 04/2018
  Department of Civil & Environmental Engineering,
  Clarkson University, Potsdam, NY, USA
  Supervisor: Prof. Thomas M. Holsen

- M.S., Environmental Engineering, 09/2013
  University of Tehran, Tehran, Iran
  Thesis: Improvement of the particles transfer system of an industrial unit using numerical solution
  GPA: 16.83/20.00

- B.S., Civil Engineering, 07/2009
  Qom University, Qom, Iran

- Has experience with WRF-SMOKE-CMAQ
- PhD involved simulating dispersion and deposition of mercury over Tehran

Budgets for 2021 and 2022

BUDGET STATUS FOR FY2021

Projected Budget for 6/30/2021 (12 months into first year of biennial budget)

	A	B	C	D	E	F
1	**Estimate for 2021**	**pay per 1/2 month**	**Benefits pe**	**tuition**	**f&a**	**total forecast**
2	Mahshid 4/16 - 5/16	1142.75	190.84		160.0308	$2,987.24
3	Joe 4/16 to 6/30	1617.97	786.08		288.486	$13,462.68
4	Ana - summer	954.50	14.69	1725	116.3028	$4,981.48
5	Mashid summer	1142.75	14.69	1725	138.8928	$5,614.00
6	Post doc June	5000.00	1345		2201.715	$8,546.72
7	UI	394.56			47.3476	$441.91
8	Equip	5k - no f&a				$5,000.00
9	Postdoc ad					$100.00
10						
11	budget	120000				
12	expense	38440.28				
13	forecast	41134.02				
14	REQUESTED CARRY-OVER	40425.70				

PROJECTED BUDGET FOR FY2022

Projected Budget for 2022

Rough Expense Estimates for 2022					
Ana Carla - Fall + Spring + June 2022	20615	4000	13755	2953.8	$41,323.80
Amin - Postdoc 2022	60000	16140		26420.58	$102,560.58
NKN web services	5000	5000	5000	5000	$5,000.00
HPC hardware	10000				$10,000.00
Estimated salary costs for 2022					$158,884.38
Carry-over + 2022 budget					$160,425.70

Funding has also been committed from the WSU CEE department; partial funding for new postdoc and TAs, if needed.

Carry-Forward Tasks

TASKS CARRIED FORWARD TO 2021-2022

FY2022 Task	Comments	Timeline
Create updated **AIRPACT6** forecasting framework to accommodate changes in computation platform and implement component updates/upgrades	*Compiler bug has been fixed.* *Now proceeding with compiling required libraries for use by AIRPACT6*	Nov 2021

TASKS CARRIED FORWARD TO 2021-2022

FY2022 Task	Comments	Timeline
Update biogenics to MEGAN v3 in AIRPACT6 (possibly with HPC parallelization) in AIRPACT6	*Pending progress on building AIRPACT6 on new HPC (MEGAN v3 will take unique coding for parallelizing)*	Dec 2021
Extend the AIRPACT forecast period from 48 h (2 days) to 72 h (3 days), in AIRPACT6		Jan 2022
Case studies for ozone and PM2.5 for events using new AIRPACT6 system (rerunning previous events for evaluation and study)		Mar 2022

TASKS CARRIED FORWARD TO 2021-2022

FY2022 Task	Comments	Timeline
Switch to running with updated emissions and SMOKE 4.5, in AIRPACT6	*In progress:* *Issue submitting jobs to the HPC has been resolved* *Test SMOKE 4.5 on Aeolus or Motley (Farren)*	 TBD TBD

TASKS CARRIED FORWARD TO 2021-2022

FY2022 Task	Comments	Timeline
Implement the Simple Air Quality Model (PSCAA) for PM2.5 in Tacoma, in AIRPACT6	*In progress:* *Phil S. had issues with new WSU VPN requirement but can now log onto WSU cluster.* *Working on providing set of parameters for entire domain*	Dec 2021?

TASKS CARRIED FORWARD TO 2021-2022

FY2022 Task	Comments	Timeline
Interpolate ML forecasts for ozone and PM2.5 to provide domain-wide forecasts, using AIRPACT5 or 6. Incorporate existing sensor networks (Urbanova, Purple Air, …) into ML forecasting system.	*To be continued by newly supported graduate student, Ana Carla Fernandez-Valdes*	Started in May 2021; on-going Dec 2021

TASKS CARRIED FORWARD TO 2021-2022

FY2022 Task	Comments	Timeline
Experimental drone flights of opportunity to study wintertime inversion conditions (e.g., Pinehurst, ID).	*On hold due to covid-19 pandemic*	As needed going forward

Proposed Deliverables

DELIVERABLES

FY2022 Deliverables

Continued support for On-going Tasks (see Joe Vaughan's status)

AIRPACT6 framework

Improvements to Machine Learning (ML) forecasts for PM2.5 and ozone

Support for implementation of SAQM forecast system (with Phil S.)

Final Report

Requests and/or Suggestions for New Tasks?