



# **NW-AIRQUEST**

## **WSU Workplan Ideas**

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# Overview

- Freeze development of AIRPACT after finishing 2019 updates
- Continue daily operations of AIRPACT 6
  - Extend forecast period from 72 hours (3 days)
- Provide training workshops for AIRPACT 6
  - How to obtain data
  - Tools for working with data
  - How to best interpret forecasts
- Establish a new Machine Learning Forecast System
  - Based on results from Kai Fan's research on ozone forecasting



# AIRPACT 6

- **PM2.5 Bias Correction**
  - Create web graphics for community use and interpretation
  - Finalize the interpolation of the Kalman-filter bias correction
- **Extended Forecast Time**
  - Add a third 24-hour forecast to the sequence of current 2-day forecasts
  - Update web graphics for community use
- **Schedule training workshops**
  - Summer 2020 (perhaps May...)



# Machine Learning Forecast System

- Apply the ML-based ozone forecasting system to other observation sites
  - Note that the current ML forecast system predicts future ozone levels using ozone observation data and WRF meteorology forecasts, which means it provides ozone values at a single location
- Develop an ML-based PM2.5 forecasting system for mountain valley area such as Pinehurst, ID
- Apply the bias-correction techniques
  - ML-based forecasts can exhibit biases, so this process will help improve forecast skill
- Interpolate the ML-based predictions to provide a domain-wide forecast
  - Until we have observation data with a very good spatial coverage, the current AIRPACT (based on WRF-SMOKE-CMAQ) can be used for this interpolation process
- Incorporate more observation sites such as low-cost sensors
  - The more observations, the better !! (at least if they're high-quality)
- Implement the Simple Air Quality Model proposed by PSCAA
  - Initially for PM2.5 in Tacoma



# Personnel

- **WSU Faculty**
  - Dr. Yunha Lee
  - Dr. Joe Vaughan
  - Dr. Von P. Walden
- **Postdoctoral Fellow**
  - Amit Sharma (until April 2020)
  - New postdoc (May 2020)
- **Graduate Students**
  - Kai Fan – Machine Learning
  - Ana Fernandez – 1.3-km WRF over Spokane, Machine Learning
  - Mahshid Etesamifard – Testing of CMAQ 5.2, source attribution
  - Matthew Roetcisoender – Low-cost sensors, Machine Learning

**Questions?**