## Presentation Objectives

- 1. Examples of how weather data can be used in practice to:
  - a. Understand risk and exposure retrospectively
  - b. Examine changing seasonality of risk factors
  - c. Inform early detection and response systems
  - d. Forecast risk, forecast surge, forecast opportunities?
  - e. Plan budget and workforce capacity needs
  - f. Improve health promotion and protection messaging
- 2. Audience share experiences / ideas for weather data use [could inform NWCC presentation?]
- 3. Gauge interest in attending a training on meteorological data





## Overview

This is an example of how weather data can be used in practice to: a. Understand risk and exposure retrospectively d. Forecast risk, forecast surge, forecast opportunities?

Structure:

- Wind analysis for pesticide drift project
- Pesticide Illness Monitoring and Prevention Program
- Meteorological data source
- Advantages for public health application
- Challenges
- Takeaways

## What is pesticide drift?

**Primary drift**: off-target movement during or shortly after application

- Regulatory (EPA, WSDA, OSHA, L&I)
- "Spray drift"
- Wind speed/direction, temperature

## **Secondary drift**: off-target movement post-application

- Non-regulatory
- "Vapor drift"
- Wind speed/direction, temperature





## Pesticide drift "news feed"



Pesticide drift issues in Washington continue despite lawsuits

OCTOBER 09, 2016 2:00 PM



# Drift tops list for state Ag's pesticide investigations

April 14, 2016, 2:26 p.m.

The Seattle Times

#### Sudden rise in Washington pesticide illnesses

Originally published May 12, 2014 at 10:22 pm | Updated May 14, 2014 at 2:27 pm

A sudden rise in pesticide drift incidents in Eastern Washington orchards has sickened 60 people since March -- a typical number for a full year, the Washington State Department of Health said Monday.

### Drift case

Meets the WA DOH case definition for an individual with a documented drift exposure

## Drift event

An incident where one or more drift cases experienced exposure from a particular source





#### Time: Tree fruit drift events, 2000-2015



Source: WA DOH, combined illness case data



#### Time: Tree fruit drift events, 2000-2015



Source: WA DOH, combined illness case data

### Space: obtained 15-minute weather data for 2000-2015



#### ☆ AgWeatherNet

Sign In News Outlook

Warnings

Weather Dashboard

Current Conditions

Past 24 Hours

Yesterday's Weather

Summary Reports

Weather Data

Graphs

Calculators

Crop Models

Irrigation

Disease models



AgWeatherNet provides access to current and historical weather data from Washington State University's automated weather station network along with a range of models and decision aids. The weather data, advisories, customized weather alerts and decision support systems provided by AgWeatherNet and WSU can help improve production and product quality, optimize resource use and reduce environmental impact.

#### Source: WSU AgWeatherNet (AWN) Online Portal



Source: WSU AgWeatherNet (AWN) Online Portal

#### Count of AgWeatherNet stations by year



Source: WSU AgWeatherNet (AWN) Online Portal

Space: drift event zip code count and AWN stations, all crops



#### Space: drift event distance to nearest AWN station, tree fruit



## Takeaways

- Challenges
  - Each drift event is a case study
  - Impact of proximity, timing, microclimate on variable(s) of interest
  - Are 15-min wind measurements the right time scale?
- Advantages
  - Ask and answer new questions for public health surveillance data
    - Seasonality
    - Wind behavior
  - New routines for systematic collection of weather data for drift events
- Future work
  - Utilize wind ramping for forecasting
  - Precision agriculture uses big data (link with other data)

#### Future work: forecasting wind ramping events

