

National Aeroallergen Monitoring and Tracking Network: Potential Collaboration: CDC, NASA, NAB, and NOAA

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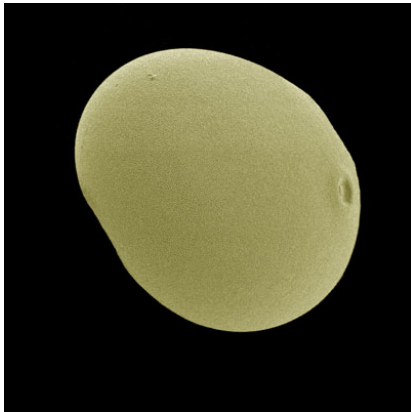
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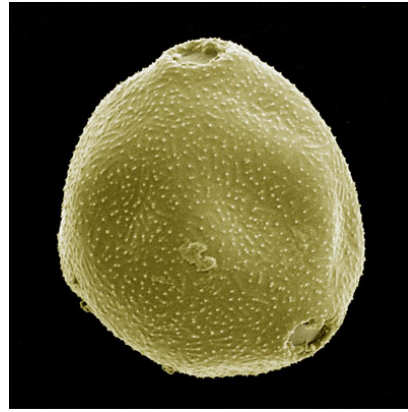


a) Maize

☒ b) Juniper

☒ c) Birch

☒ d) Grass

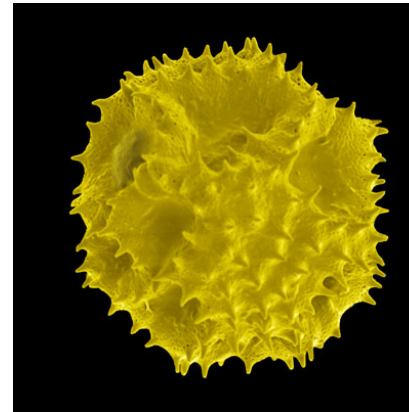


☒ a) Cedar

☒ b) Oak

c) birch

☒ d) poplar

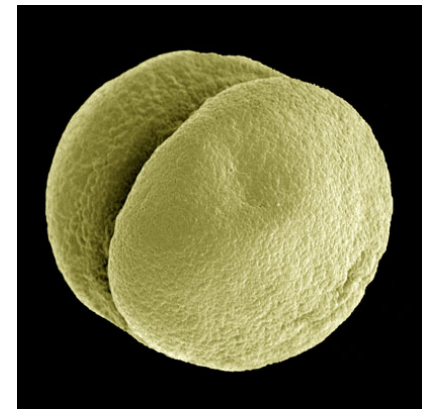


☒ a) Poplar

b) Dandelion

☒ c) Oak

☒ d) Cedar



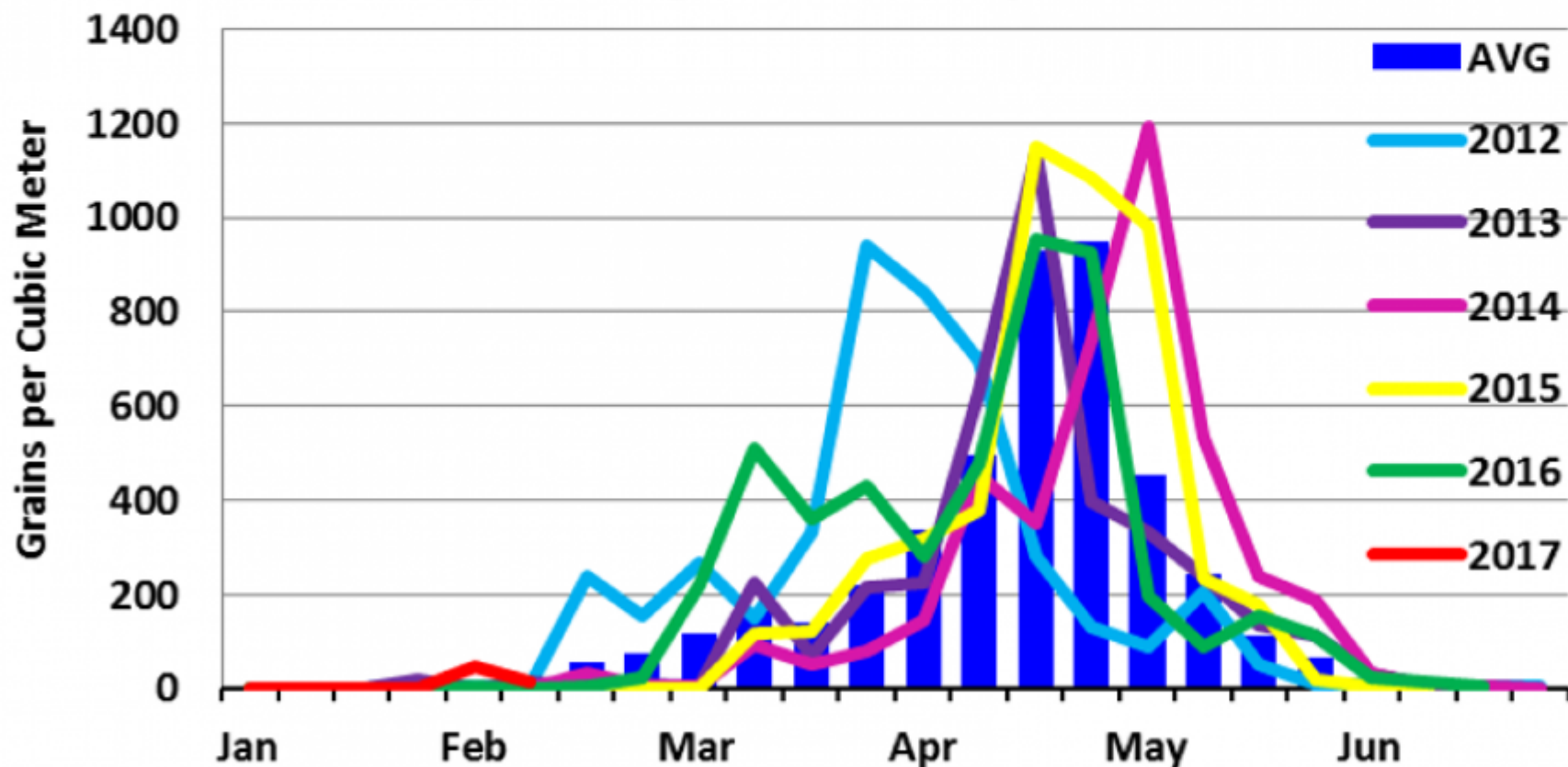
☒ a) Aster

☒ b) Juniper

☒ c) Mulberry

d) cedar

2012-2017 Tree Pollen Volume vs Average Daily Average for Weekly Periods

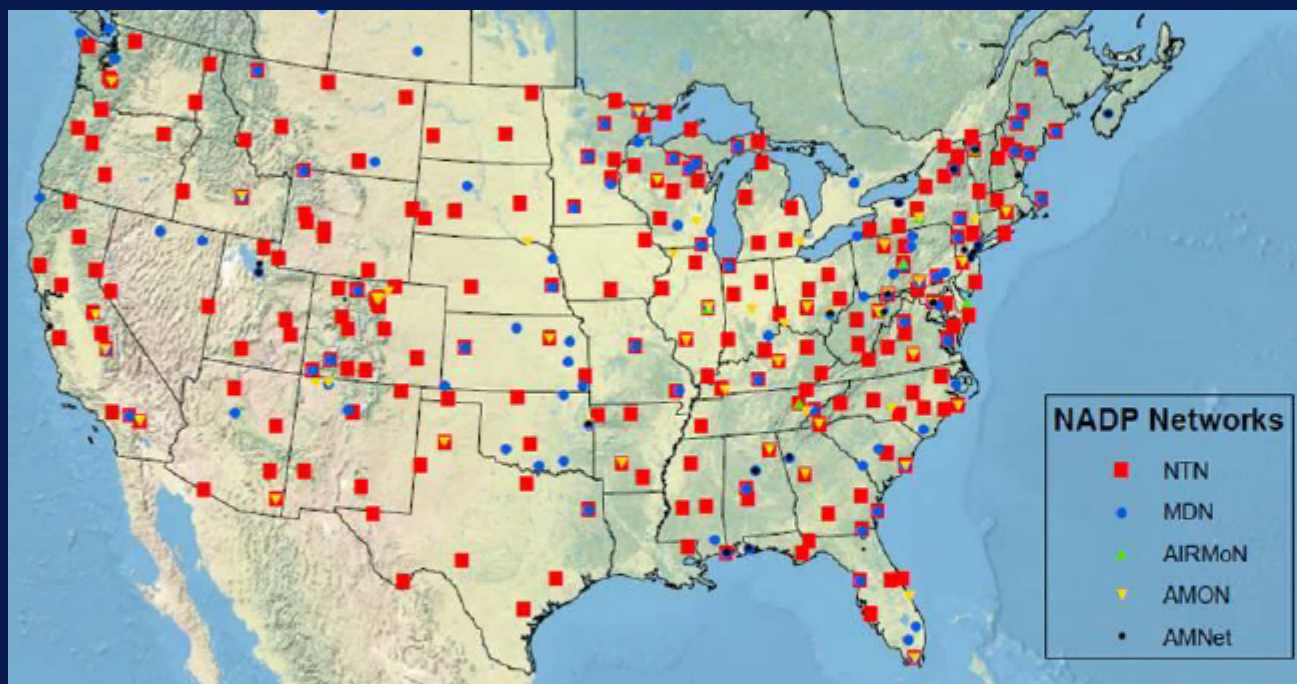


Courtesy of Susan Kosisky, U.S. Army Centralized Allergen Ext Lab. Cited in Washington Post by Jason Samenow, Editor of Capital Weather Gang, February 22 2017



NOAA/ARL recognizes the need for an aeroallergen monitoring network (AMN):

- Focusing first on pollen;
- Health community's long term support is needed for establishment & sustainability;
- Measurements are prerequisite for a credible forecasting system;
- Measurements should be resolved by pollen species, size, location and time;
- Automation of the National Allergy Bureau's microscopic sampling is needed;
- NADP could potentially house the AMN data for easy accessibility;
- The NADP 's few hundred sites below could be candidate AMN stations :





Leverage satellite observations to aid pollen forecast



Urban to Regional scale weather/climate prediction

- Temperature, wind,
- Precipitation, ... etc.



Soil/moisture

- Landsat 30m data
- SMOPS soil moisture
- STATSGO 1km soil
- burn scar



Pollen prediction

- Phenology
- Emission
- Transport
- Deposition



Vegetation canopy

- Enhance Veg index
- NDVI
- Leaf area index
- IGBP
- Green veg fraction



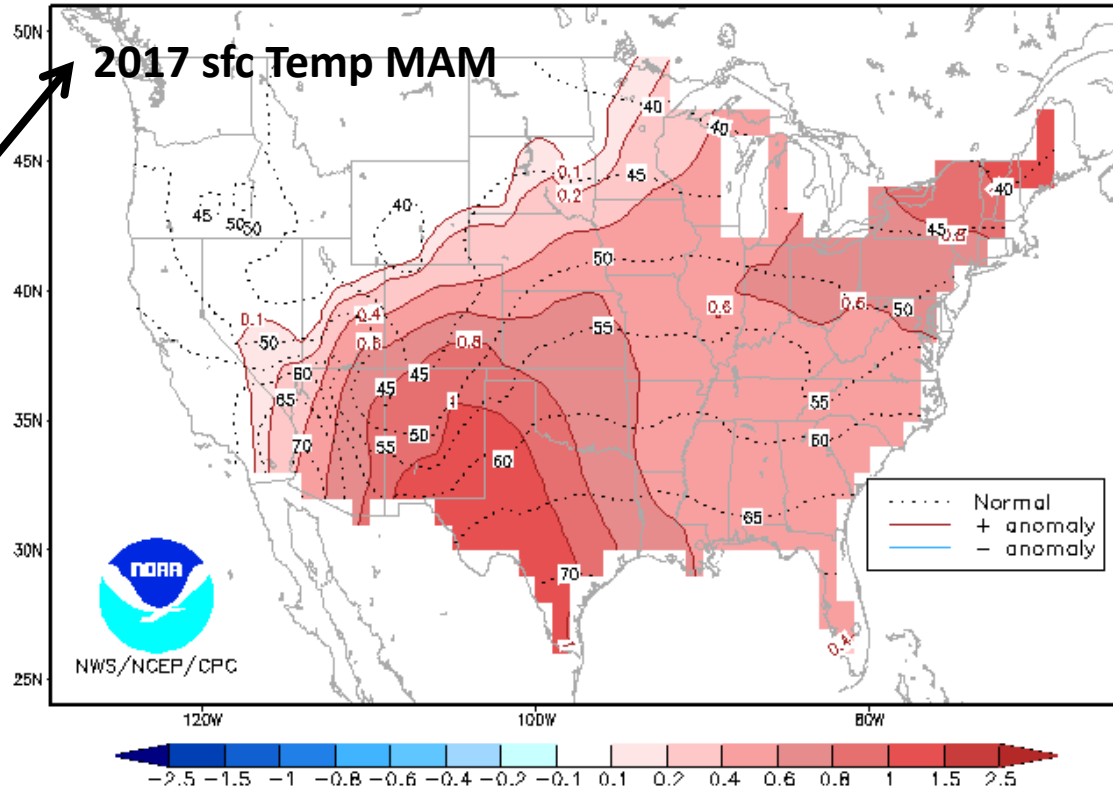
Epidemiology and exposure response projection

- Asthma morbidity,... etc.

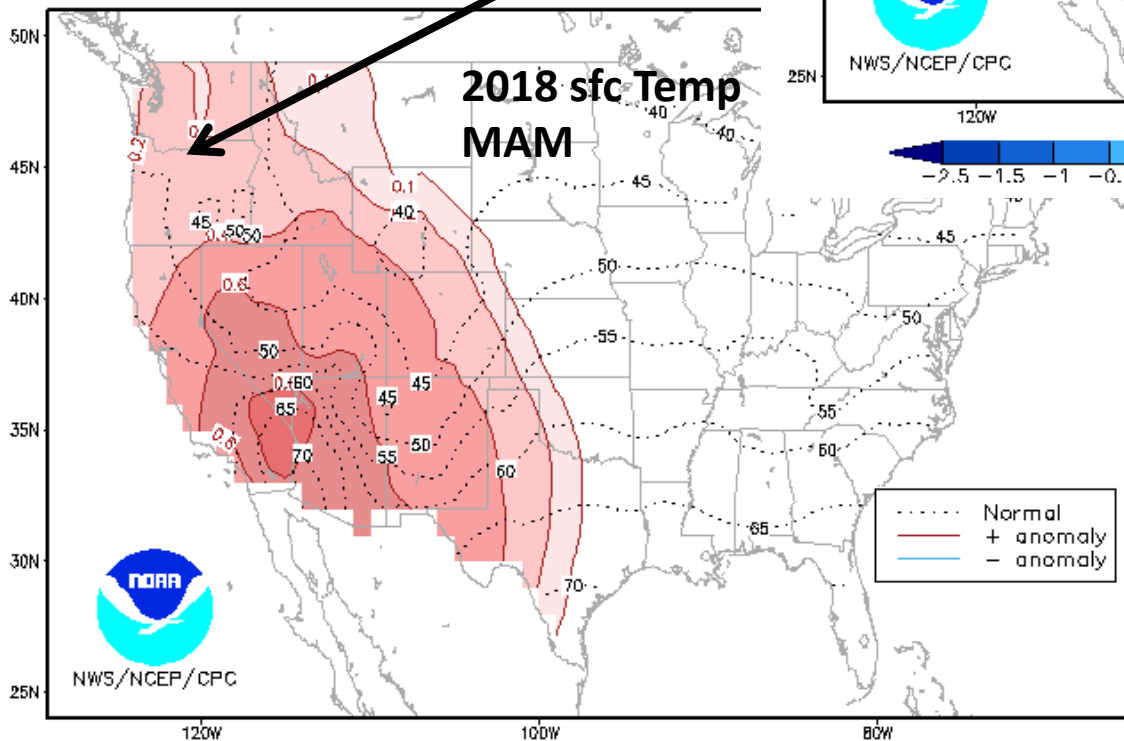
A handful of meteorological field such as Precip, soil moisture
Wind and rh ... governs onset
and severity of pollen emission

NOAA Climate Prediction
Center (CPC) forecasts seasonal
meteorology for 2017 and 2018

2017 sfc Temp MAM



2018 sfc Temp
MAM



CPC forecasts sfc seasonal
temperature anomaly in °F
w.r.t 1980-2010 average



HAQAST ~~Ozone~~ pollen Surface Concentration



Healthy Air Forecasting and Reanalysis

(pollen)

What's New Introduction The Team News Article Publications Acknowledgment

Forecasting

Reanalysis

Introduction

✓ Ozone (O₃)

NO₂, SO₂, and CO

PM_{2.5}

PM_{2.5} Component

PM₁₀

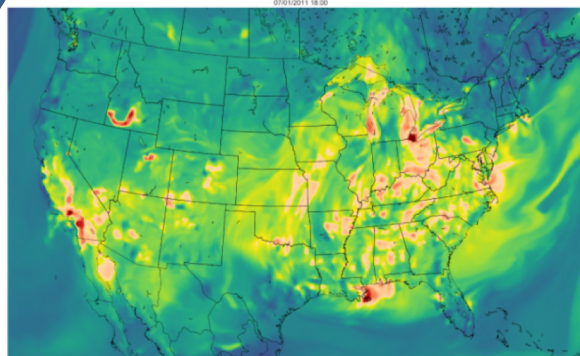
Deposition

< 07-01 >

North America Chemical Reanalysis (NACR):

Surface Ozone

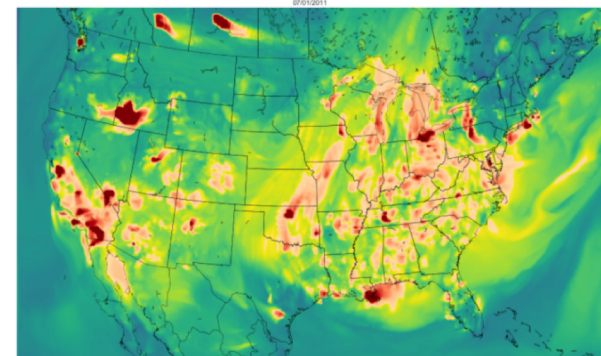
animated (unit: ppbV)



Download Map

Download Data (netcdf)

max(O₃) (unit: ppbV)



Download Map

Download Data (ASCII)

Can be hosted?

Disclaimer:

These data are research products generated with support from NASA Health and Air Quality Applied Science Team (HAQAST) Initiative.

SUMMARY

- **CDC, NBA, NOAA and other institutions ... establish a National Pollen Monitoring Network**
- Monitoring is a prerequisite to substantiating research and service
- Network Sustainability: Continue interest, automation and leveraging existing networks
- Data archiving and dissemination: Partnerships with operational centers
- **Achievable goal (e.g., TT): Seasonal forecast for onset and severity of pollen emission**
- National Weather Service Climate Prediction Center provides a wealth of data
- Retrospective studies to quantify the performance of the approach using NAB obs, ..., etc

