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Funding from:

*Richard Fleming Sr. Fellowship @ UW*



**CoSEE**  
CENTERS FOR OCEAN SCIENCES  
EDUCATION EXCELLENCE  
Ocean Learning Communities  
connecting people around our ocean



**School of Oceanography**  
University of Washington

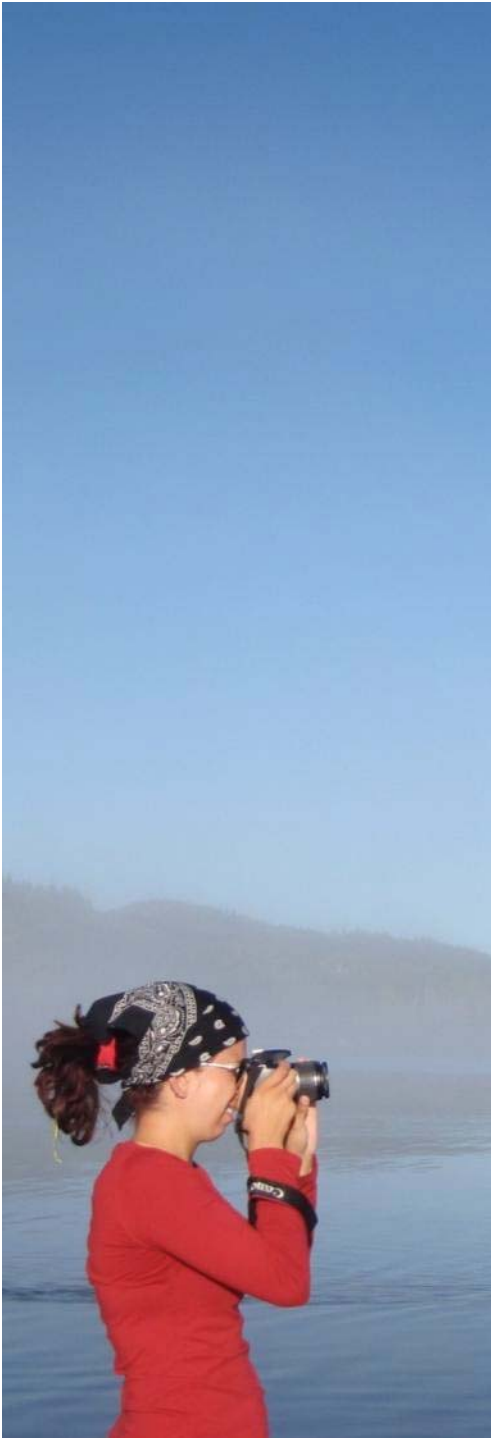


**Seattle  
Public  
Utilities**

# Quick Poll

- Have you ever participated in Citizen Science (bird counts, 'your back yard' etc.)?

Raise your hands if 'yes'





# Outline

- What is SoundCitizen?
- About Our Volunteer Network
- Some Data: Natural and Industrial Chemicals

- 
- Why and how we started  
And why we keep going



# SoundCitizen: What is it?

- **Research** about connections between land and sea
- A **Network** of volunteers, students and schools
  - Thousands of samples
  - 300+ volunteers strong
  - Collect water quality information
  - Collect water samples for laboratory analysis.
- coordinated by **Undergraduate** students in the School of Oceanography @ UW
- College, HS & Middleschool **Internships**
- **Curriculum** in local high schools & middle schools and growing



# What we want to learn

- What natural and industrial chemicals move **from land (forests etc.) and homes (urban areas) to Puget Sound?**
- Are they potentially bad for us?
- Are they bad for the environment?

# What we teach

- People can make simple and cost-effective **decisions that help**
  - Your home
  - Your body
  - Your local community
  - The natural environment



# How it works

- Kits are requested on-line
- Constructed and sent out by undergrads
- Samples collected by volunteers
- Mailed back to the lab  
(*\$15 total spent so far*)
- Analysis by GC-MS for 60+ compounds  
(*\$100 plus hourly wages*)
- Data sharing off our website and via papers, lectures, etc
- “The life of a kit” video

# A Typical Kit

Box

Plastic Bag

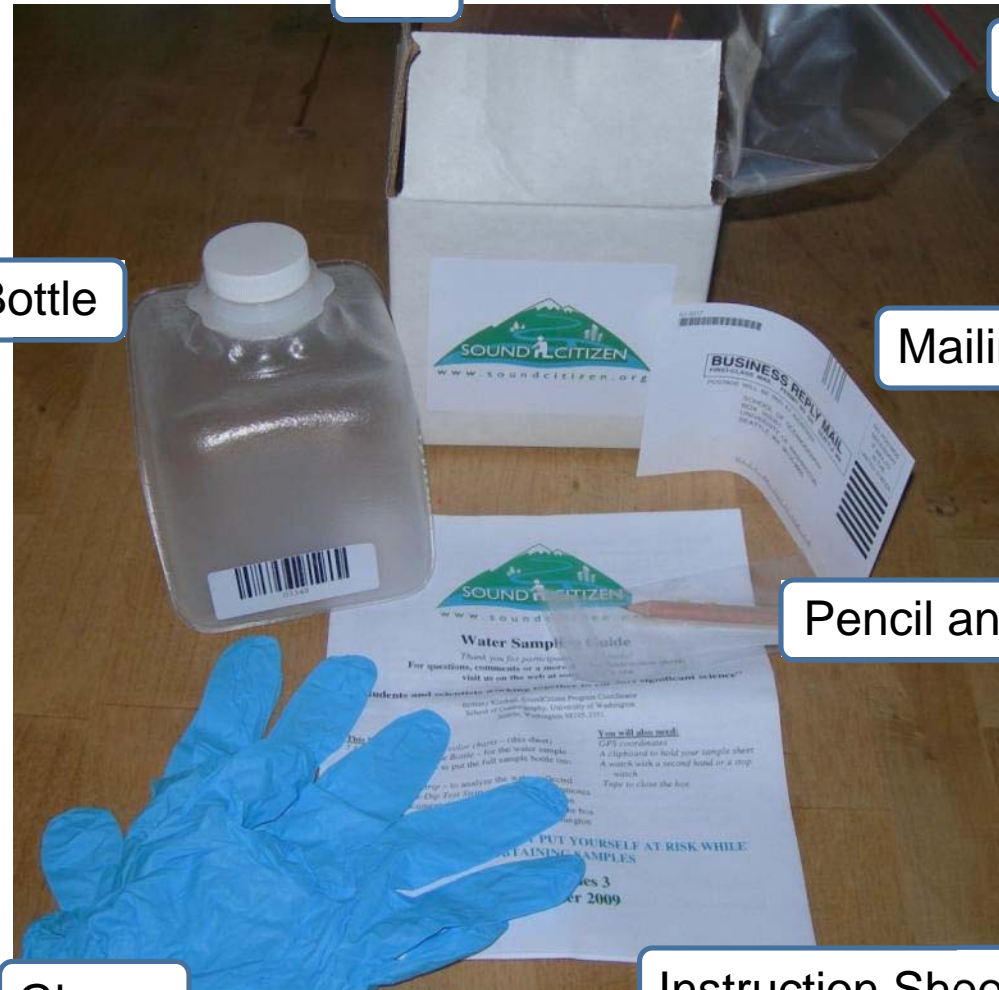
Bottle

Mailing Label

Pencil and Test Strips

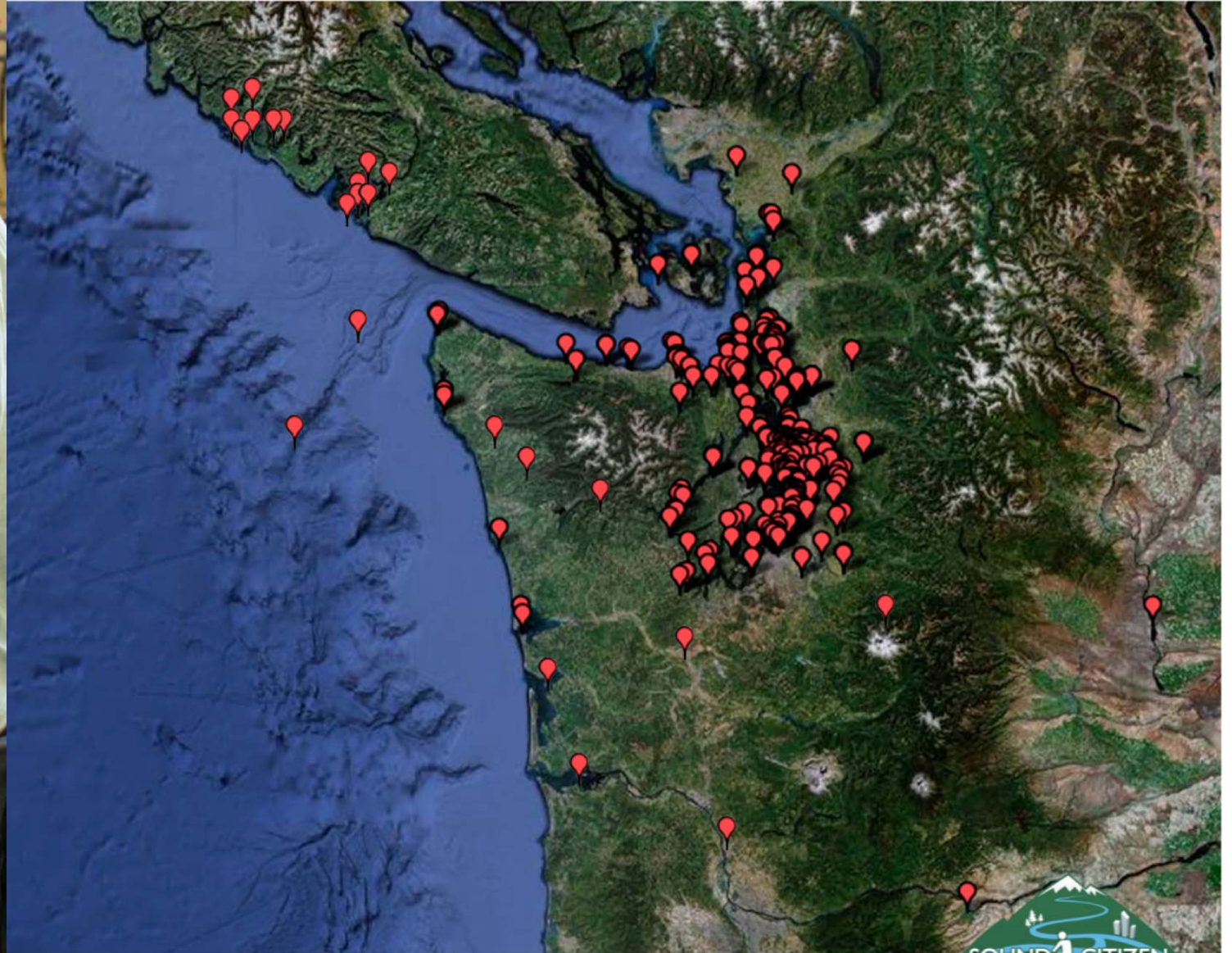
Gloves

Instruction Sheet





# Samples from Western Washington

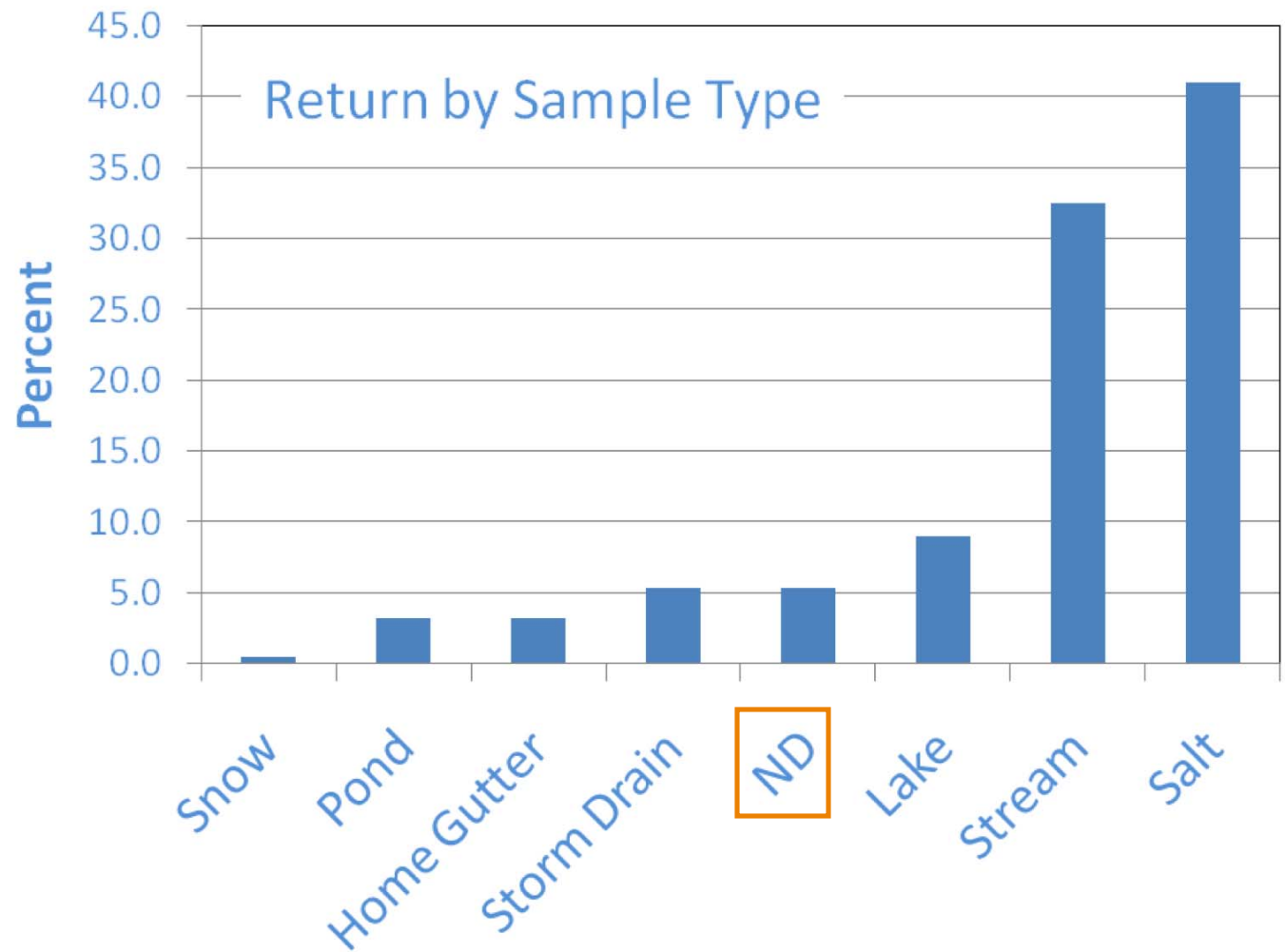




## Quick Poll

What percentage of our volunteer-collected samples have to be thrown away because of poor data collection or because of intentional contamination?

- A <10%
- B 10-20%
- C 20-30%
- D 33.3%



**~7% overall 'failure' rate**

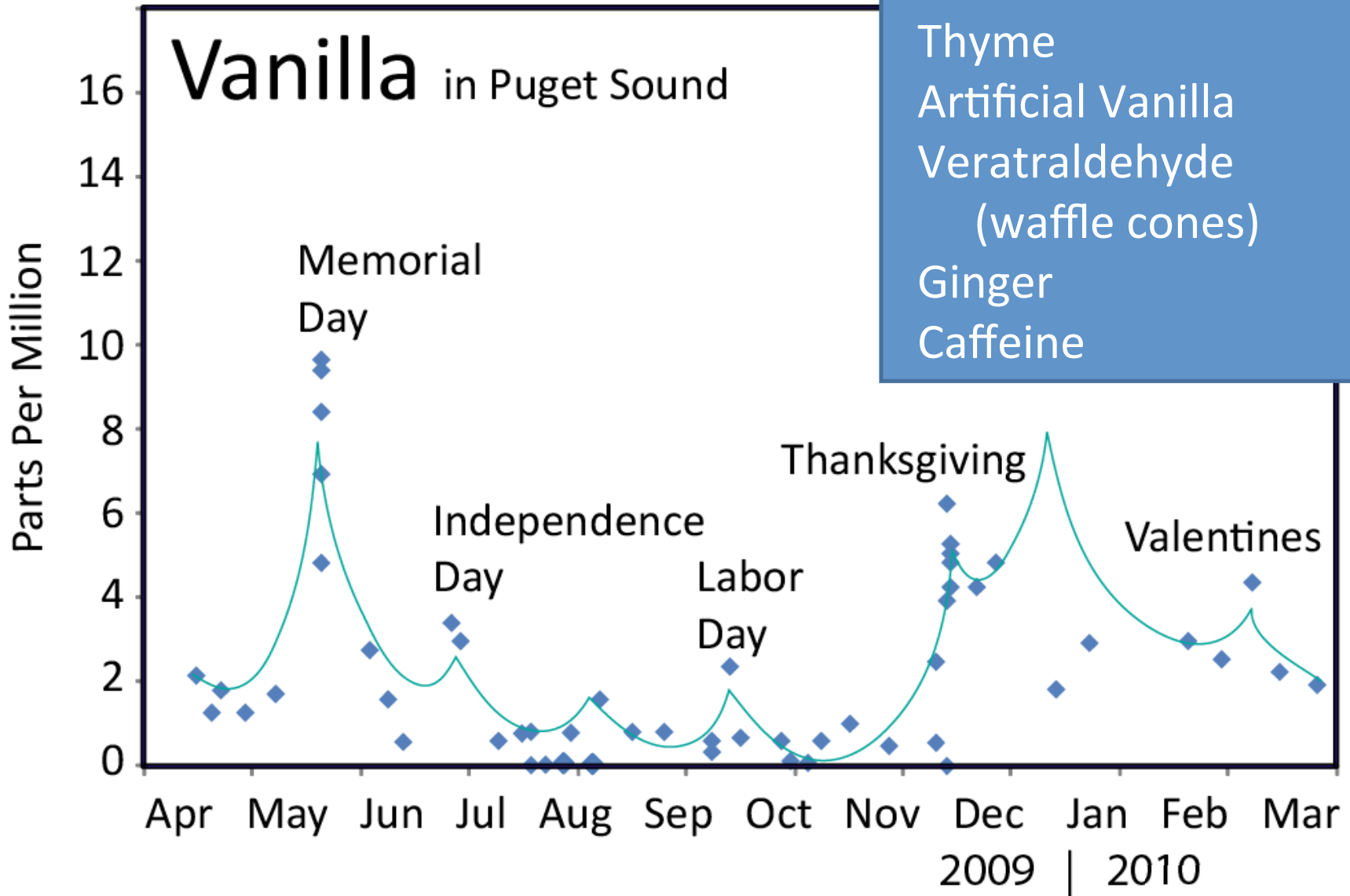


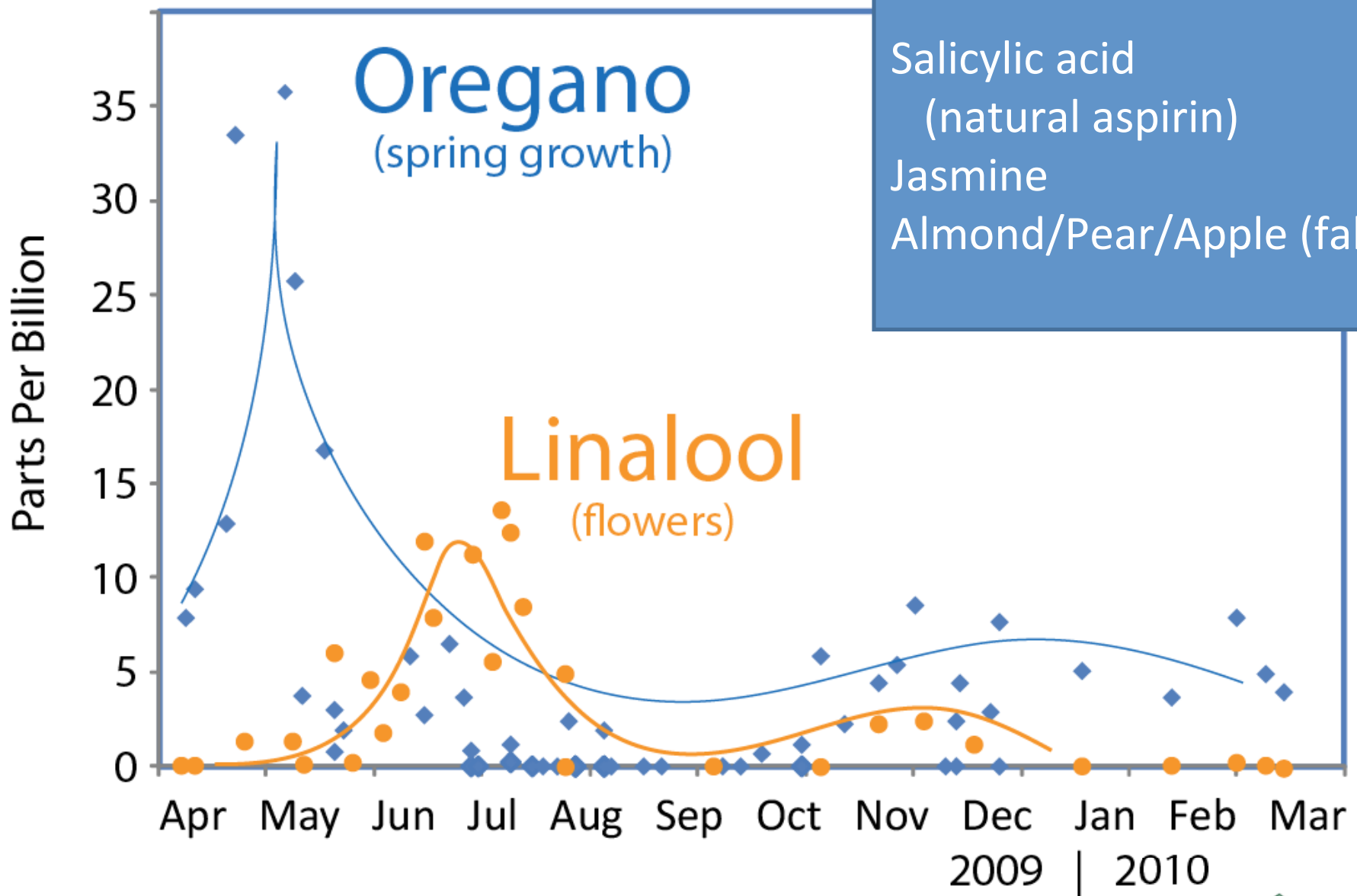
# The Chemicals

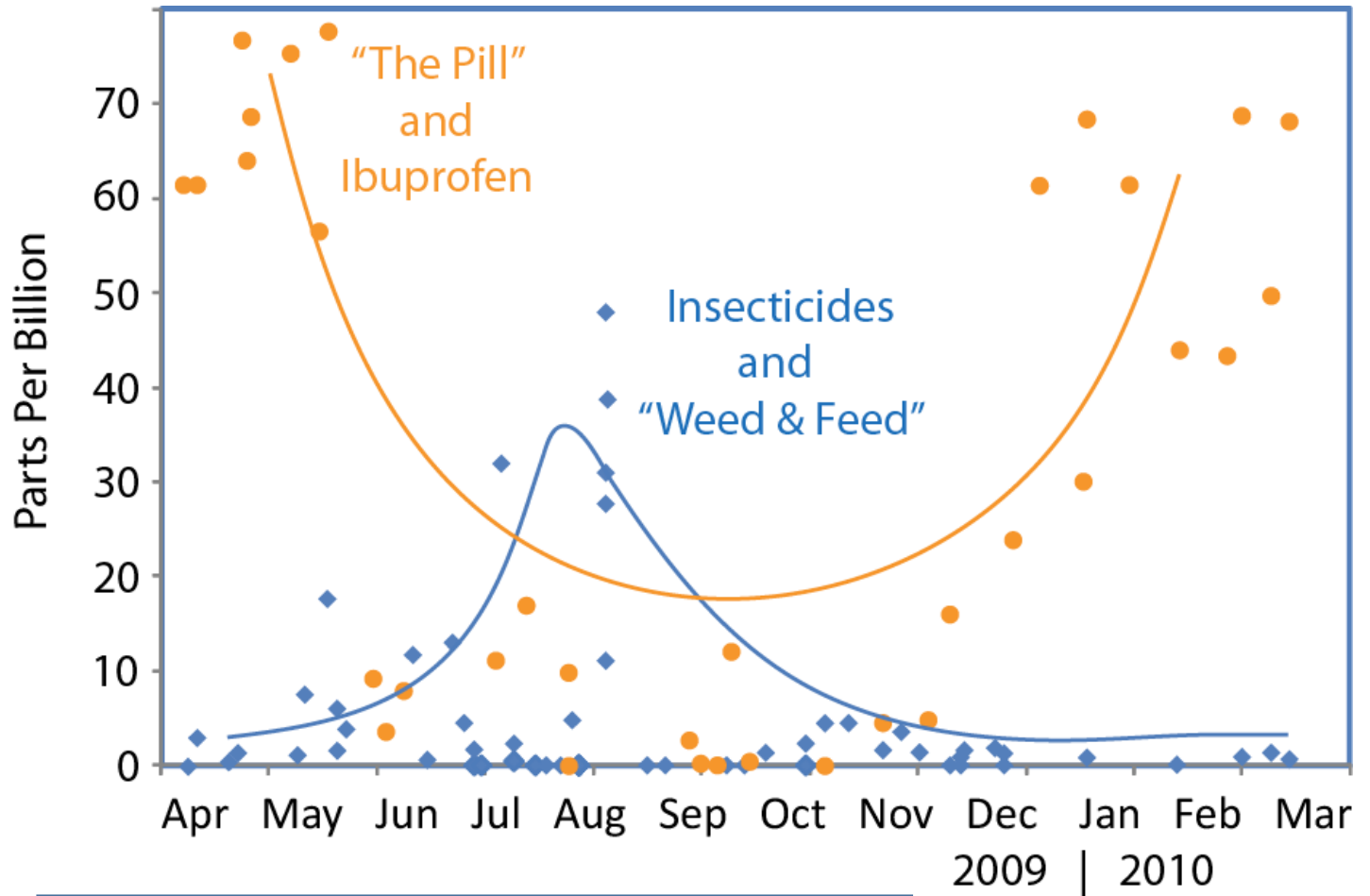
- Spices (27 spices)
- Natural & Industrial solvents (10)
- Natural and artificial perfumes (6)
- Endocrine disruptors (5)
- Plasticizers (4)
- Common pharmaceuticals (4)
- Insecticides and Herbicides (3)



# Vanilla in Puget Sound



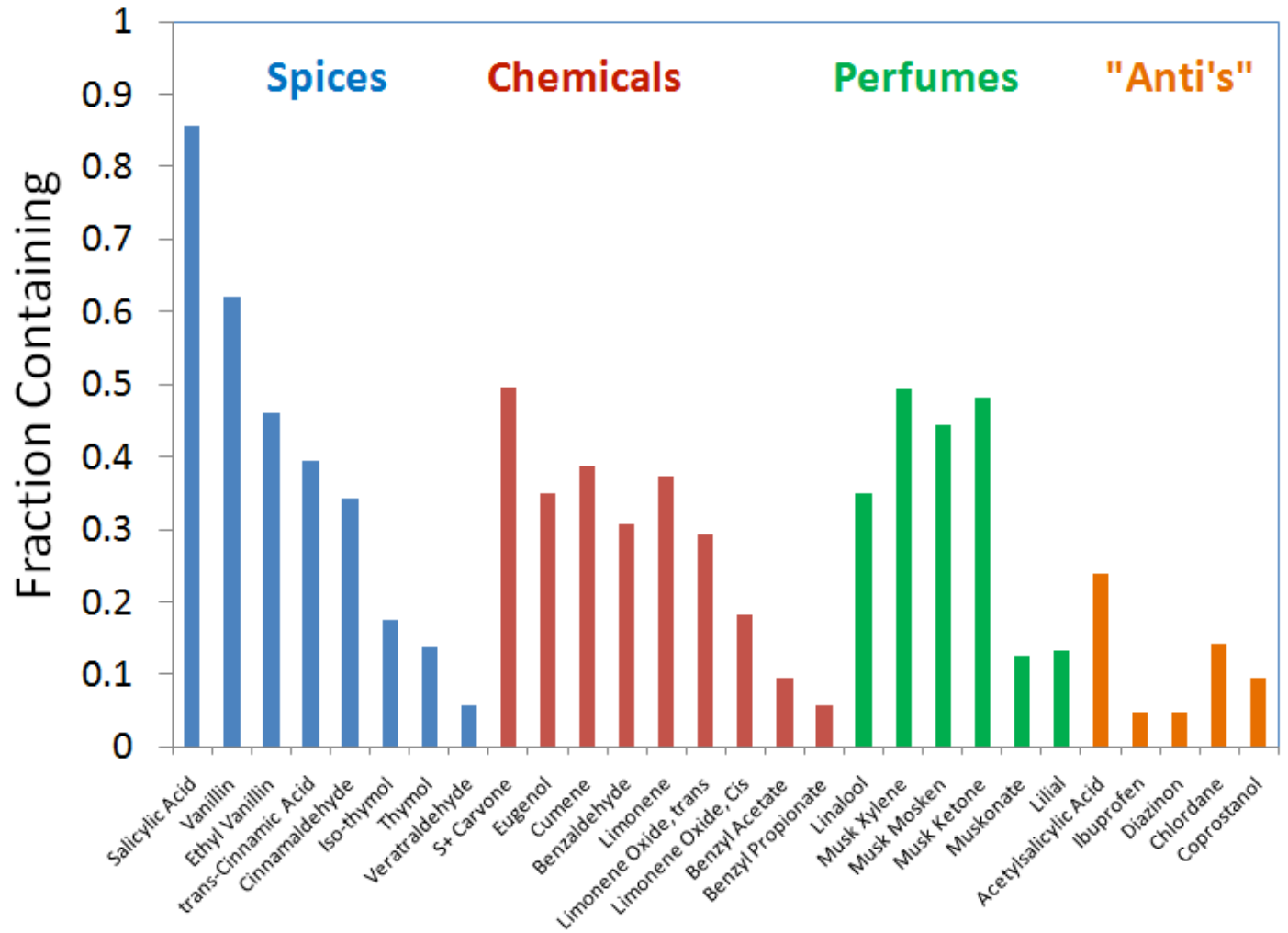




**OMNIPRESENT:**

- Caffeine
- Bisphenol
- Plasticizers
- Lillial (Lillies of the Valley – fabric softener)



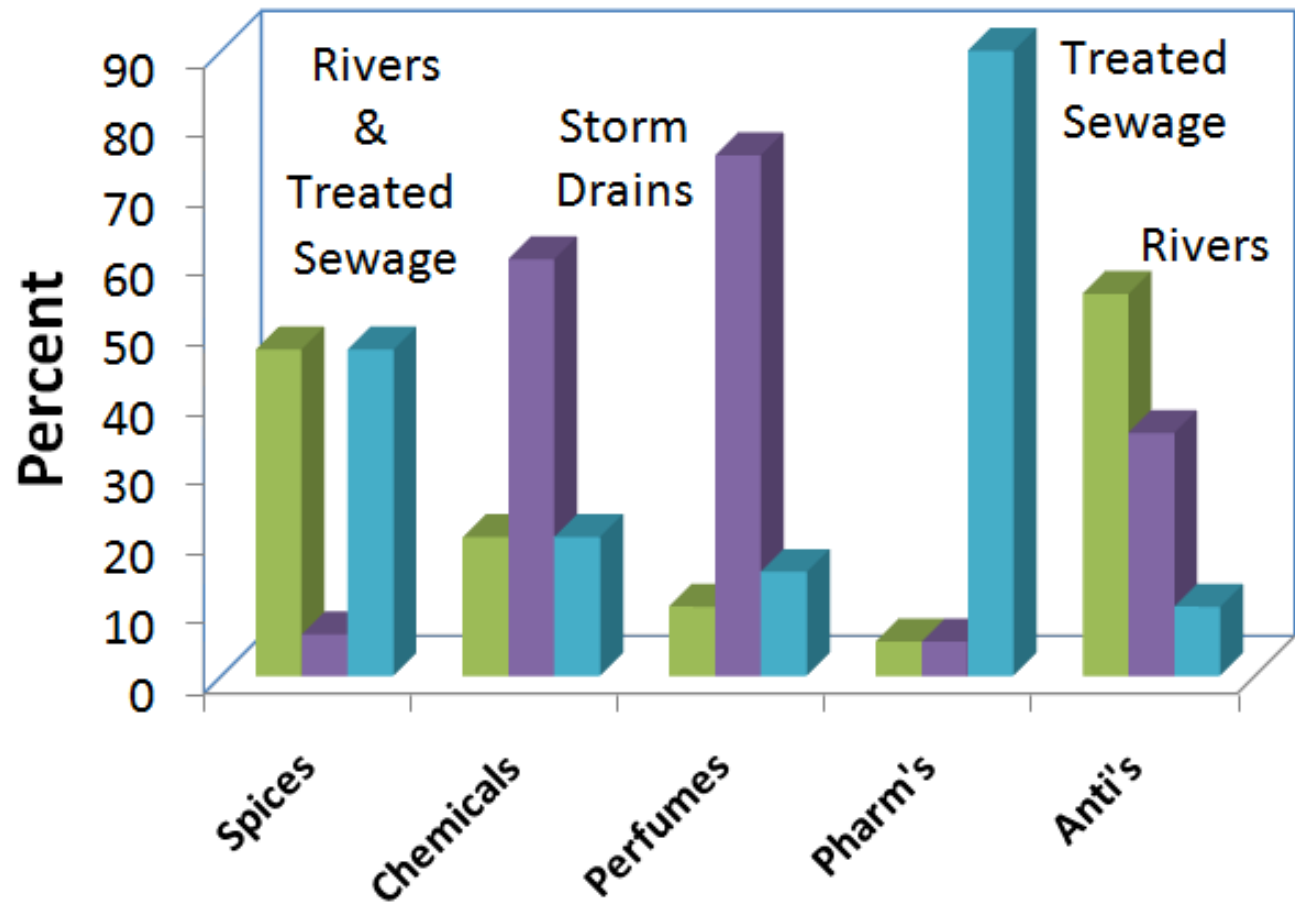


*Industrial Chemicals and Perfumes are just as prevalent in natural samples as Spices*





# Routes into Puget Sound





# What Can We Do Next?

- 1) **Request a kit** & tell your friends about us
- 2) Consider natural alternatives to common household products.

*Vinegar and baking soda*

*(lots of books & recipes available)*

- 3) Take expired drugs to a pharmacist  
*Demand that they accept them from you*
- 4) Don't over-use Antibacterial lotions.  
*Soap and warm water*





# How We Got Started

- Quick realization in summer 2008 that we alone could not collect samples efficiently.
- Rick was already interested in HS teaching, etc.
- Observed an emerging trend toward Citizen Science
- Potential way of satisfying NSF Criteria 2?





# Why we do it

- It is fun
- many samples = good statistics
- We can accommodate new scientific questions that require frequent local-scale data collection
- How can you say 'no' when people ask to volunteer for you?
- Volunteers say  
*'thank you, may I have another'*
- Someone recognized me (Rick) in the grocery store and my kids made fun of me for a week (validates the long hours at work, helps merge esoteric research goals with local community)



# Wrapping it up

- *We have grown beyond our wildest dreams*
- *We're still learning and constantly improving*

- **Science:**

- new information on species, watersheds, nutrient loadings, emerging pollutants
- unparalleled data set in terms of size
- 2 papers published, 1 in review

- **Volunteer Network:**

- ready, willing and asking for more
- we can't meet demand

- **School Network:**

- HS & MS curricula meet WA new sustainability requirements
- Internship Programs up and running

*Citizen science is fun...*





I'm done talking/webinaring now...

# Thanks

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