

Bioblitz and Smartphone Technology: A Method to Encourage Participation and Improve Data Quality in Citizen Science Research on Pacific Madrone Trees

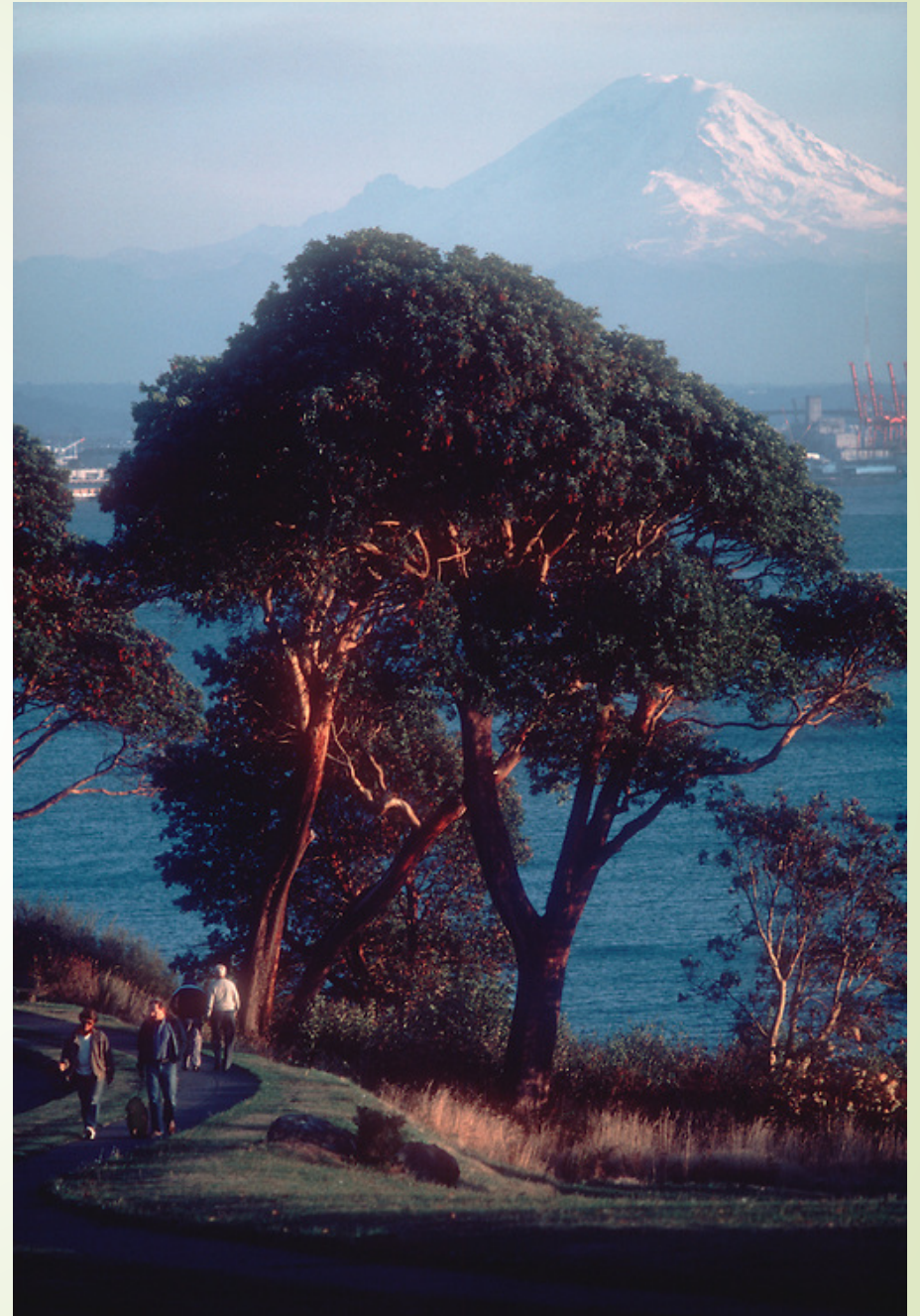
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Pacific Madrone (*Arbutus Menziesii*) Pursh

It is an iconic native species and has been a prominent landmark in the Puget Sound region for at least 200 years.

In the mid 1800's a navy geographer incorrectly identified the madrones to be magnolia trees and consequently misnamed the Magnolia community in Seattle (Adams et al., 1995).



Ecosystem Services

- Ecologically important hardwood species
- Provides food and nesting sites for numerous wildlife and nesting birds
- Provides excellent erosion control in urban areas
- Highly prized ornamental species
- Wood makes beautiful furniture
- Excellent heat source
- Potential medicinal qualities



Plight of the Pacific Madrone

Declining since the last half of the 20th century

- ~Fire suppression
- ~Development Pressures
- ~Fungal Diseases
- ~Pests
- ~Climate Change



Historic and Current Research

- Very little research to date
- Dr. Marianne Elliot, received her masters and PhD from UW School of Forestry
- Reached out to citizen scientist for symptomatic pictures with GPS coordinates
- In 2011 Seed Collection/Common Garden Project

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MASTERGARDENER

Are the Madrone's dying?

By R. JEANNE REHWALDT

We have received several calls at the Master Gardener clinic regarding the health of Pacific Madrone (*Arbutus menziesii*) trees around the county. Clients are wondering why they all appear to be dying. If you take a trip up Highway 3 north from Shelton toward Allyn, you will notice most of the Madrone trees seem to be affected.

Jenny Glass, Plant Diagnostician at WSU Research and Extension Center in Puyallup, has released a statement about what is happening to Madrone trees all over the area. The damage being observed is known as leaf spot. She notes that the problem is present in other counties and states too.

They have badly damaged Madrones at WSU Puyallup. Ms. Glass has seen damaged plants in Seattle and Whidbey Island, and heard reports from Oregon and the San Juan Islands. She states that this is a common problem over the past year. Alas, nothing practical



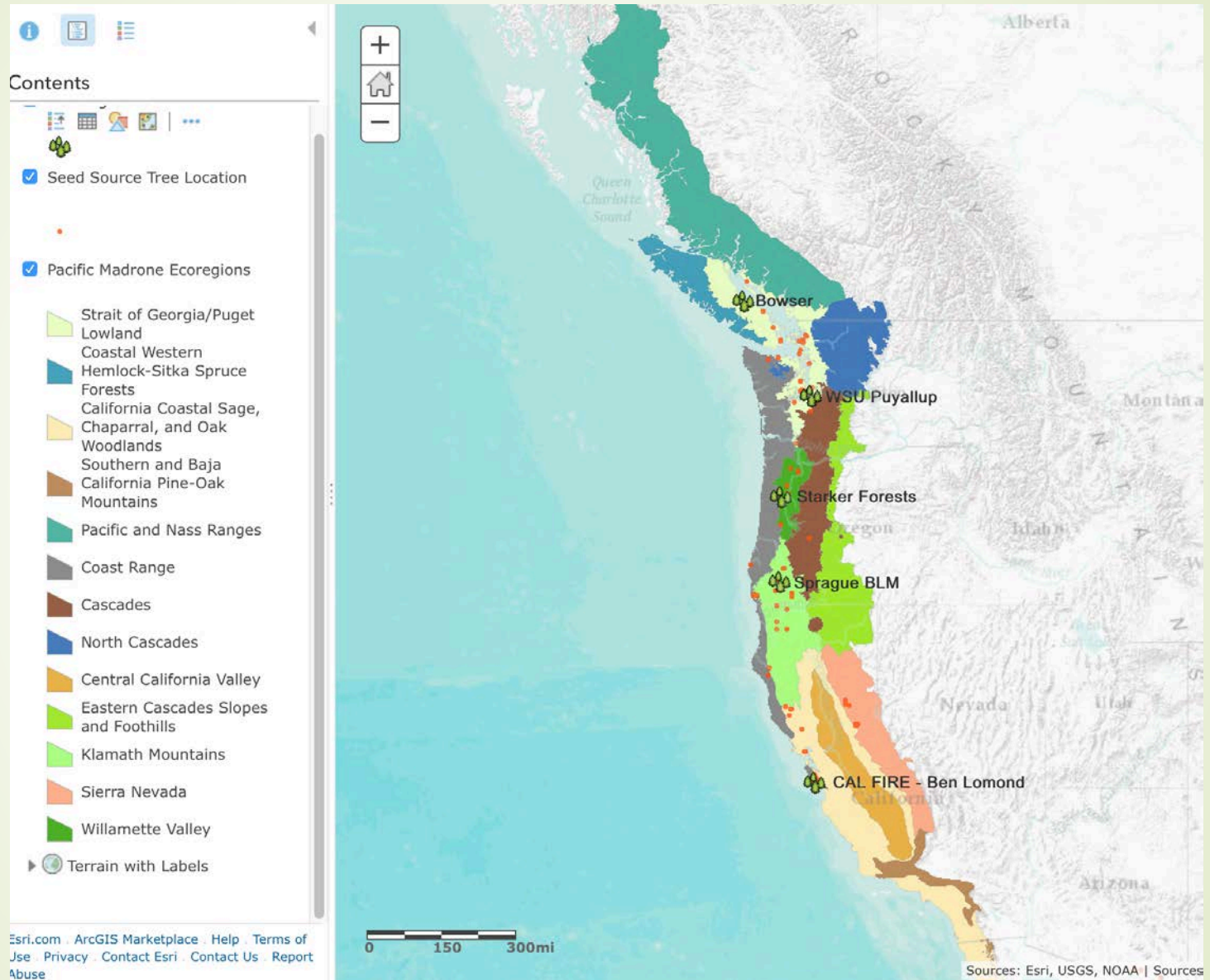
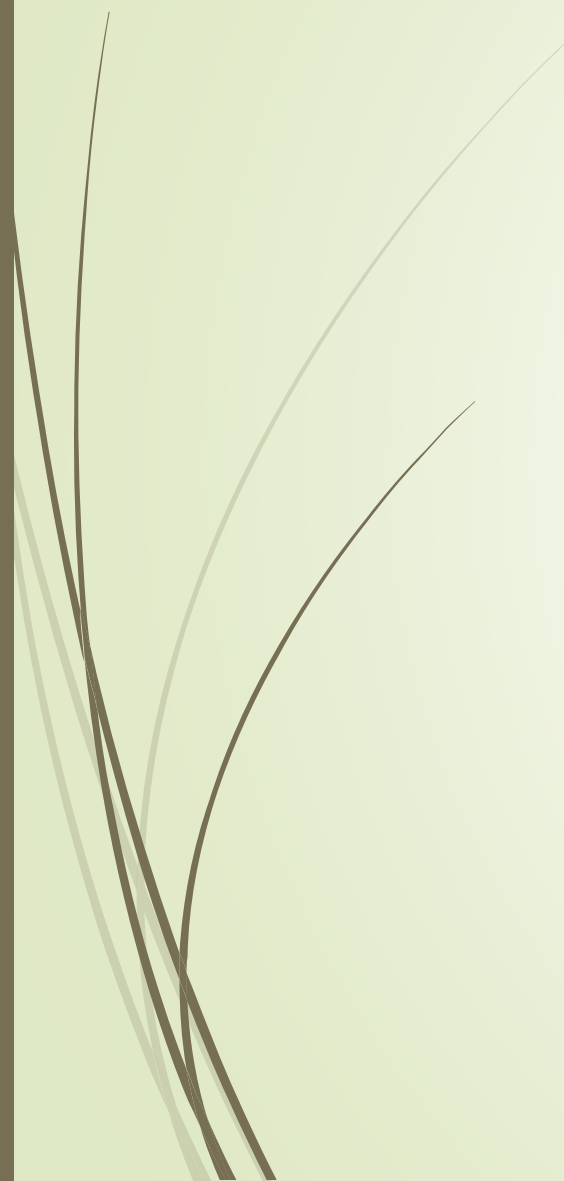
Courtesy photo

These are healthy leaves of a Pacific Madrone.

United States. If you are out in the woods and have noticed this problem on madrone, you can help. We are also interested in the health of madrones in areas without severe foliar blight symptoms. Digital photos of the trees and the site are also welcomed. To participate, please visit: http://www.puyallup.wsu.edu/ppc/madrone/diseases/foliar_blight_2011.htm.

and people are trying to follow up with research.


What should you do for Madrone trees on your property? Cultural control can help slow the spread of this disease. Rake up and destroy fallen leaves. Prune trees to ensure good air circulation, remembering to clean the pruning tools before using them on another plant. Mouthwash works really well as a pruning tool



What is Citizen Science?

- A collaboration between researchers and volunteers to address real-world problems.
- Traced back to Audubon Society bird collection counts.
- Issues w/data quality and participation





Problem:

- Madrones span a relatively large geographical region.
- Previous data lacked GPS coordinates & had to be manually entered into a data base.
- Difficult to get volunteer participation

Goal:

- Develop a citizen science mapping tool that would enable community members to publish and share information on the status of Pacific madrone trees.

Questions to Answer:

- Did the mobile tool gather data on Pacific madrones trees that span a relatively large geographical region?
- Was the data received of good quality and include geographical data that did not need to be manually entered to a data base?
- Did the bioblitz encourage volunteer participation?

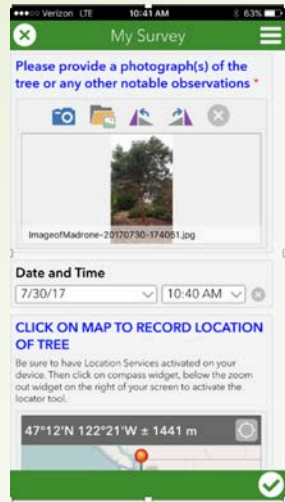
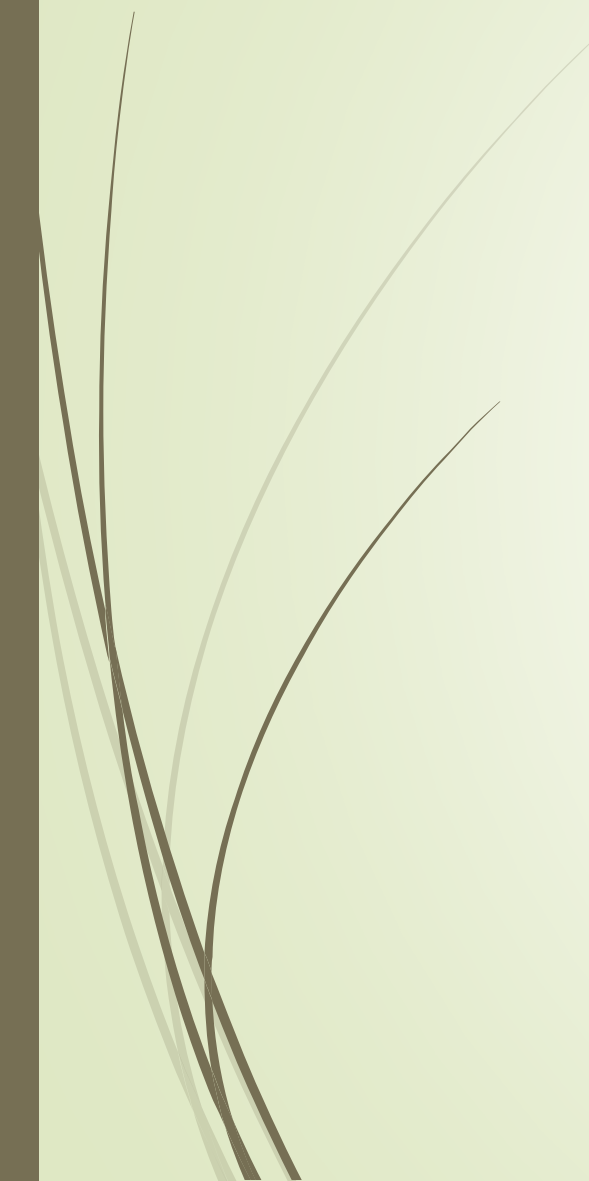
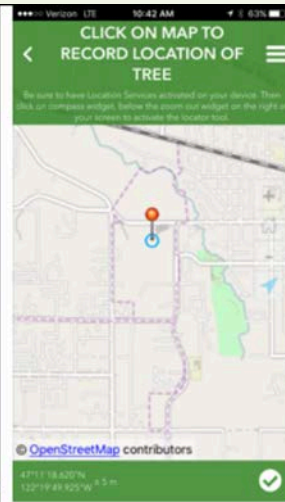
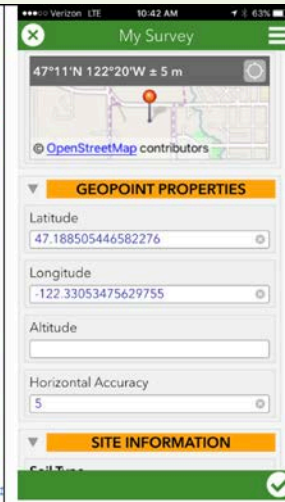


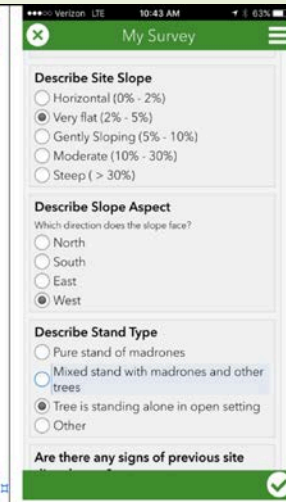
Image capture



Geointerface



Geointerface calculations



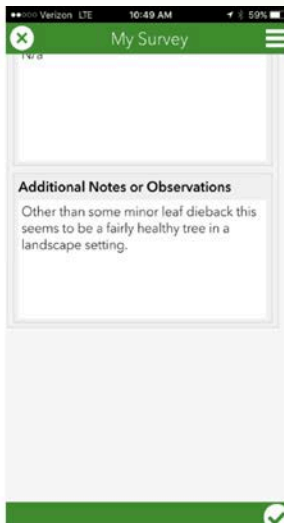
Multiple choice questions



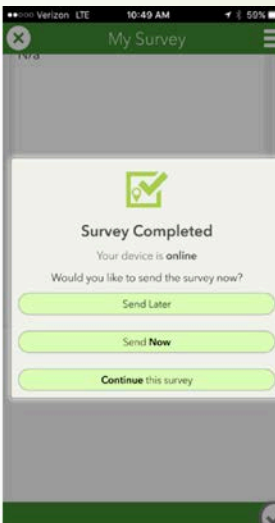
Questions w/thumbnail images



Enlarged thumbnail image



Entering text



Submitting survey

Encouraging Citizen Involvement

The Bioblitz Concept:

- A community event that brings researchers and public together.
- A rapid biological survey typically over a 24- hour period.
- Provides a snapshot of the biodiversity present in the area.
- Can be variations to the typical bioblitz model.



Bioblitz





Results:

- ~ Data was submitted to a web hosted database
- ~ 66 data entries
- ~ 30 did not have images
- ~ All but one did not have locational data
- ~ 1 was a test and no madrones in area
- ~ 1 was an incorrect species, verified by picture
- ~ some may have been duplicates of same tree



Using this application in the future:

Client will need to purchase ArcGIS License

Use organizational website, social media, post posters to advertise about future bioblitzes

Bioblitz in early spring when weather is conducive to disease

Include a question in the survey to list what type of phone they are using

Potential analysis to include:

- Species distribution and range shift

- Identify healthy tree populations



Michael Macor / The Chronicle

For more information on the WSU Pacific Madrone Project and to participate in future Madrone Bioblitzes visit:
<https://ppo.puyallup.wsu.edu/>



Storymap Link:

<https://uwt-gis-geotech.maps.arcgis.com/apps/MapJournal/index.html?appid=694ac7a99b804b9b934f441320ab8158>