

Strategic Plan to Establish and Implement Nitrogen Critical Loads and Target Loads for National Forests and National Parks in the Pacific Northwest, USA

Tonnie Cummings, Tamara Blett, Ellen Porter and Regina Rochefort
National Park Service

Linda Geiser, Jill McMurray and Rick Graw
U.S. Forest Service

Steven Perakis
U.S. Geological Survey

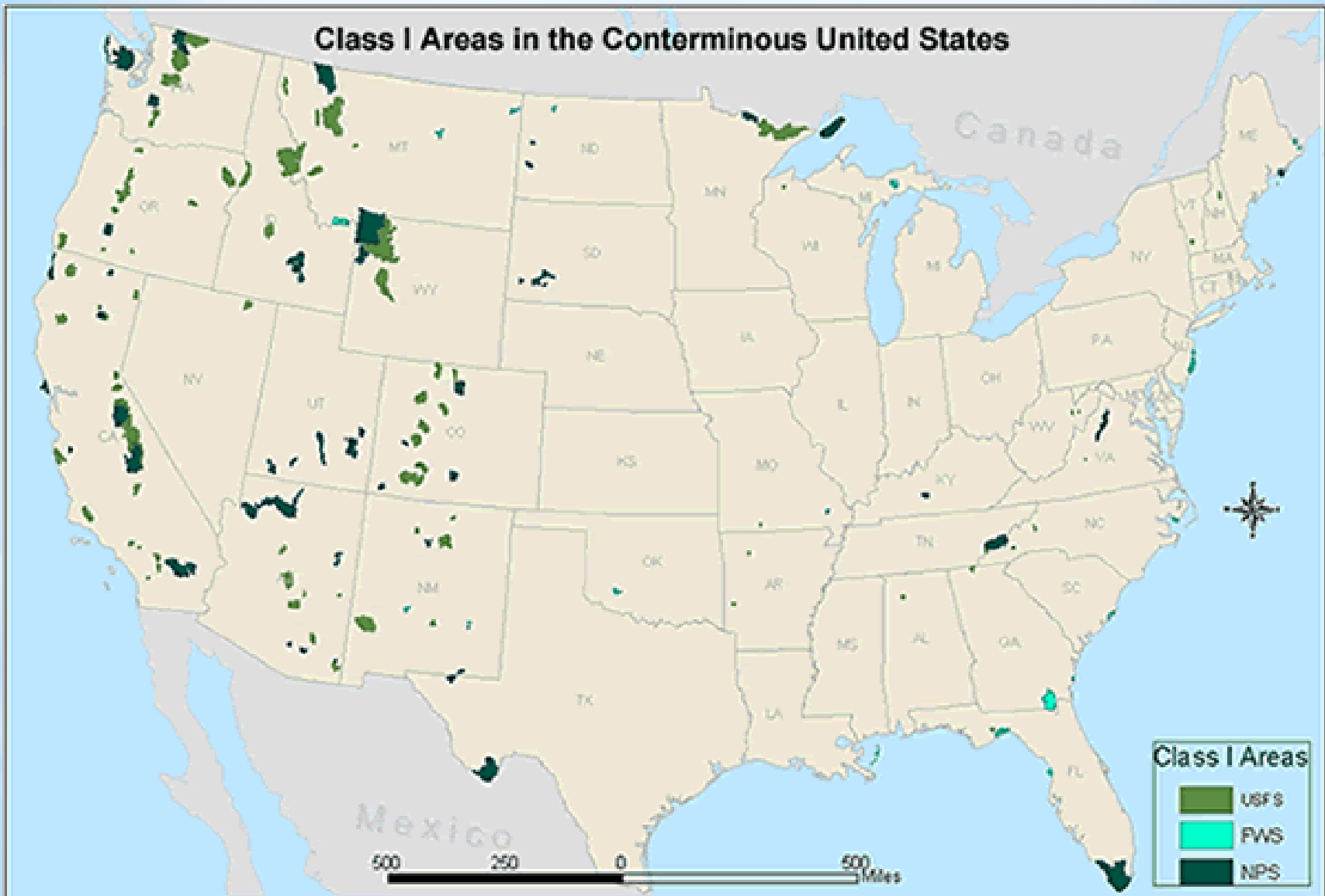


Clean Air Act

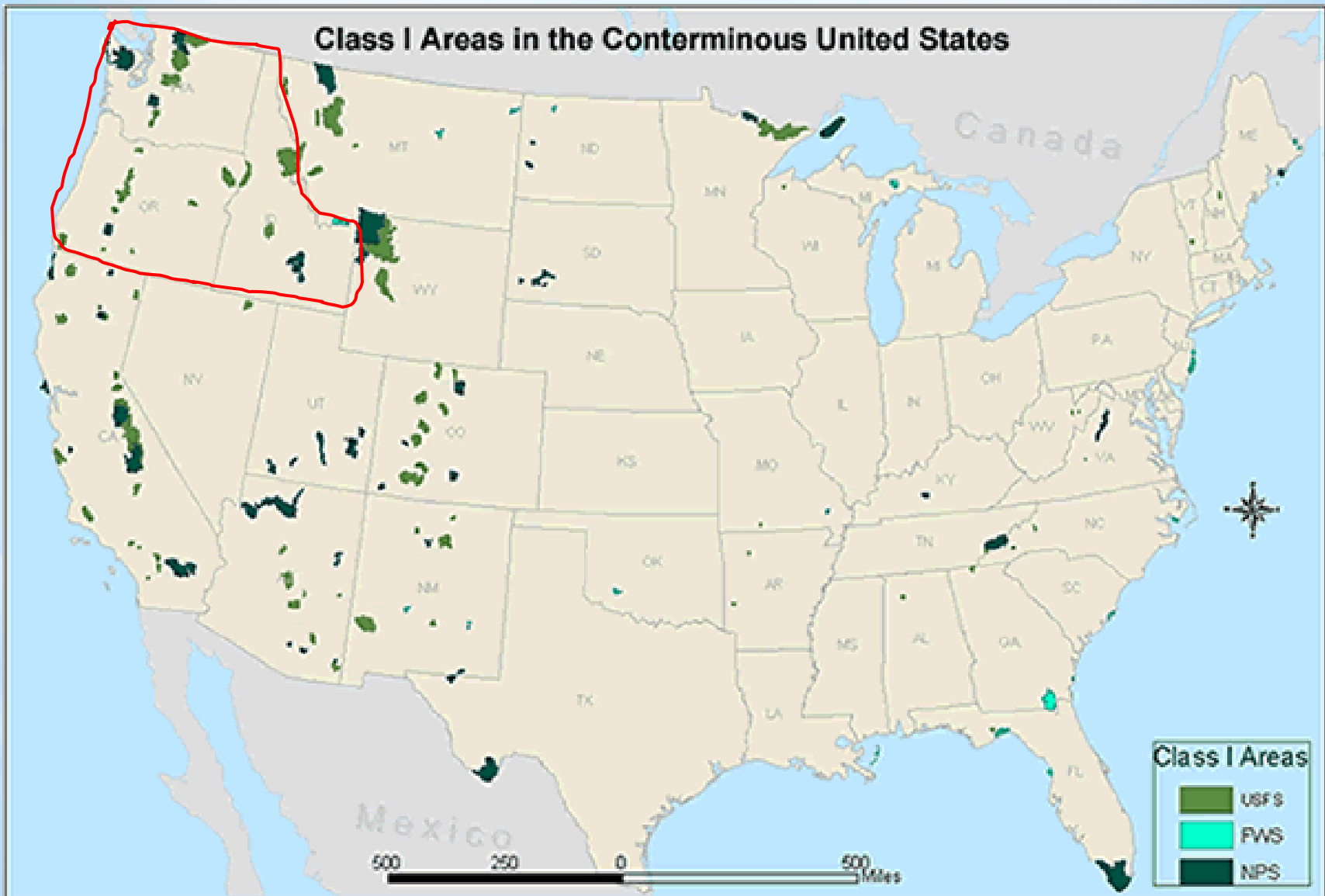
- The Clean Air Act directs Federal Land Managers, including the U.S. Forest Service (USFS) and the National Park Service (NPS), to “preserve, protect, and enhance the air quality” in mandatory Class I areas. It also provides an “affirmative responsibility” to protect air pollution-sensitive resources, e.g., lakes, streams, vegetation, soils, wildlife and visibility.



Class I Areas in the Conterminous United States



Class I Areas in the Conterminous United States



Additional Mandates for Air Quality Protection

- The Wilderness Act states that wilderness areas should be managed to preserve their natural conditions.
- The NPS Organic Act and Management Policies direct that resources and values in parks be “unimpaired”.
- The National Forest Management Act requires the USFS to develop management plans that consider the interrelationships among plants, animals, soil, water, air, and other environmental factors.



USFS and NPS Areas in the Pacific Northwest



Why Work Together?

- The strategy builds on previous regional and national collaboration by Federal Land Managers that developed consistent approaches for evaluating and addressing air pollution impacts on agency resources.
- The USFS and NPS both support the use of critical loads (CL) and target loads (TL) to protect resources.
 - A CL is the amount of pollution that causes harmful environmental effects.
 - A TL identifies an acceptable amount of pollution and is based on policy, economic, temporal or other considerations.

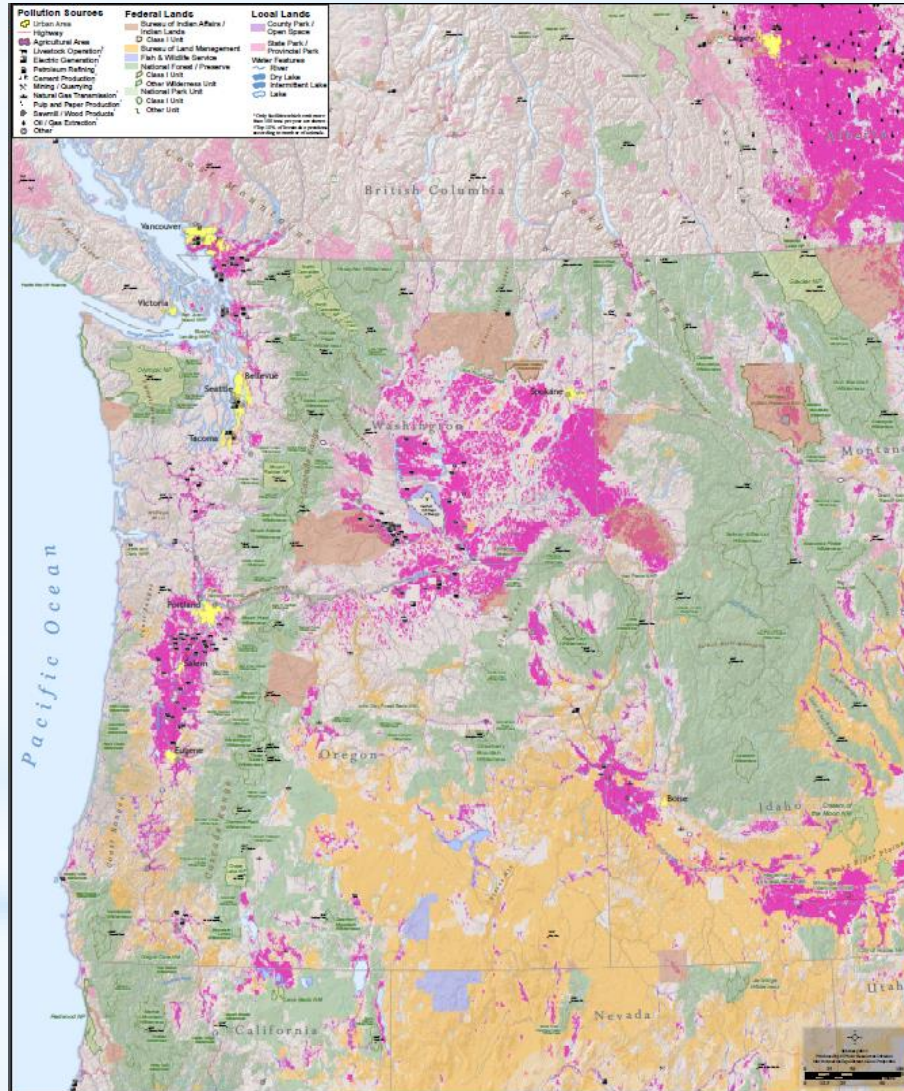


Why Focus on Nitrogen?

- Nitrogen (N) is a pollutant of particular interest in the Pacific Northwest because:
 - There are many more sources of N than of sulfur in the western U.S.
 - We are concerned about both nutrient enrichment and acidification
 - We have resources with known or suspected sensitivity to N including high elevation lakes, alpine and sub-alpine soils and vegetation, desert grasses and lichens
- In the future, we may develop joint strategies to address other pollutants of concern, such as mercury.



Public Lands and Air Pollution Sources

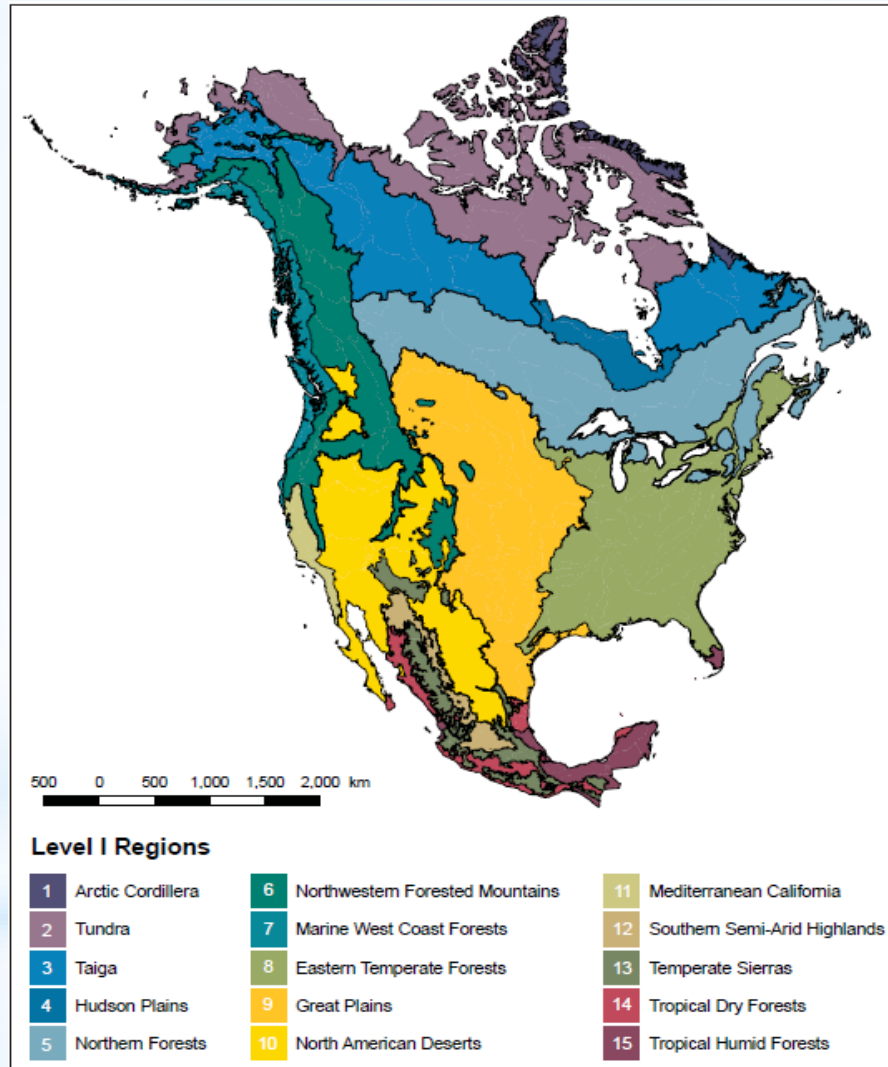


Strategy

- Objective 1- Publish a comprehensive report and accompanying 2-4 page fact sheet that summarize the current state of knowledge about CLs associated with N deposition in the Pacific Northwest. The report will:
 - Include a brief overview of sources and effects
 - Discuss the concept and use of CLs and TLs, including techniques for measuring N deposition and determining ecological response
 - Describe N CLs that apply/may apply in the PNW
 - Discuss potential interactions with other stressors such as climate change
 - Identify current research efforts, data gaps and priorities
 - **Target Date: December 2013**



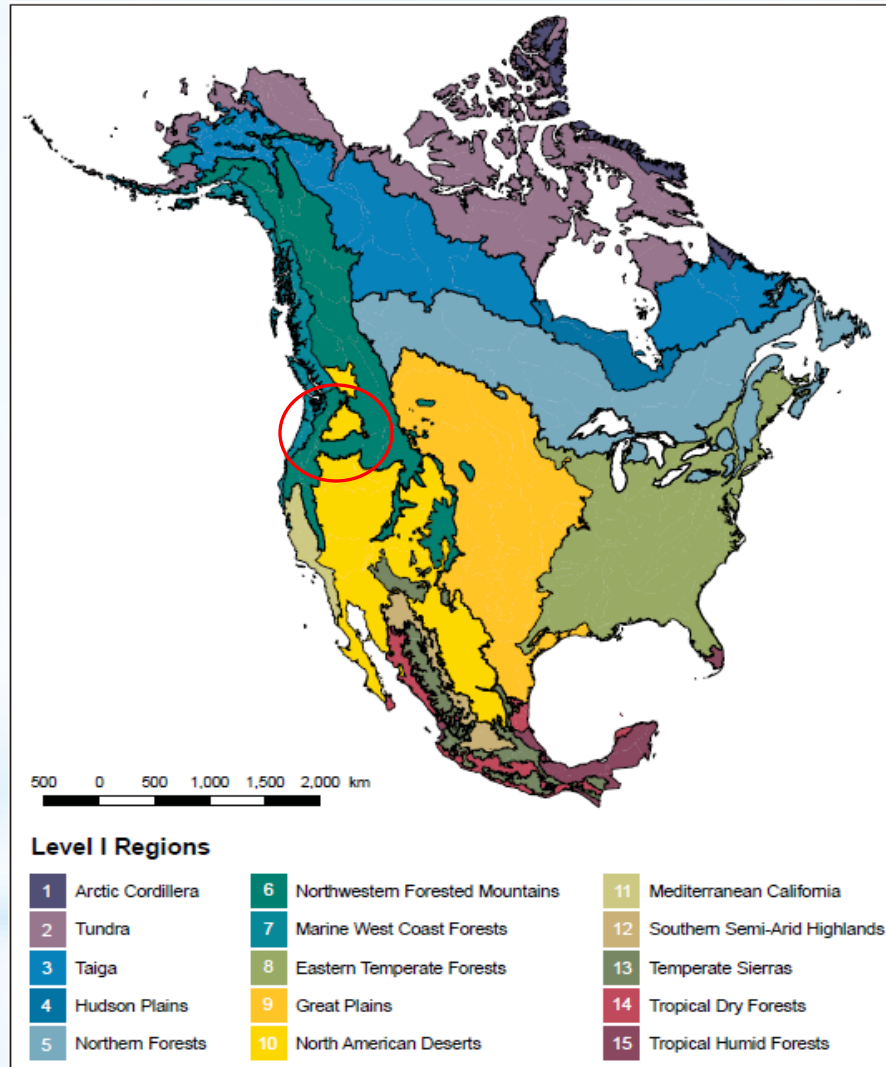
Ecoregions in North America



From the Commission for Environmental Cooperation, 1997



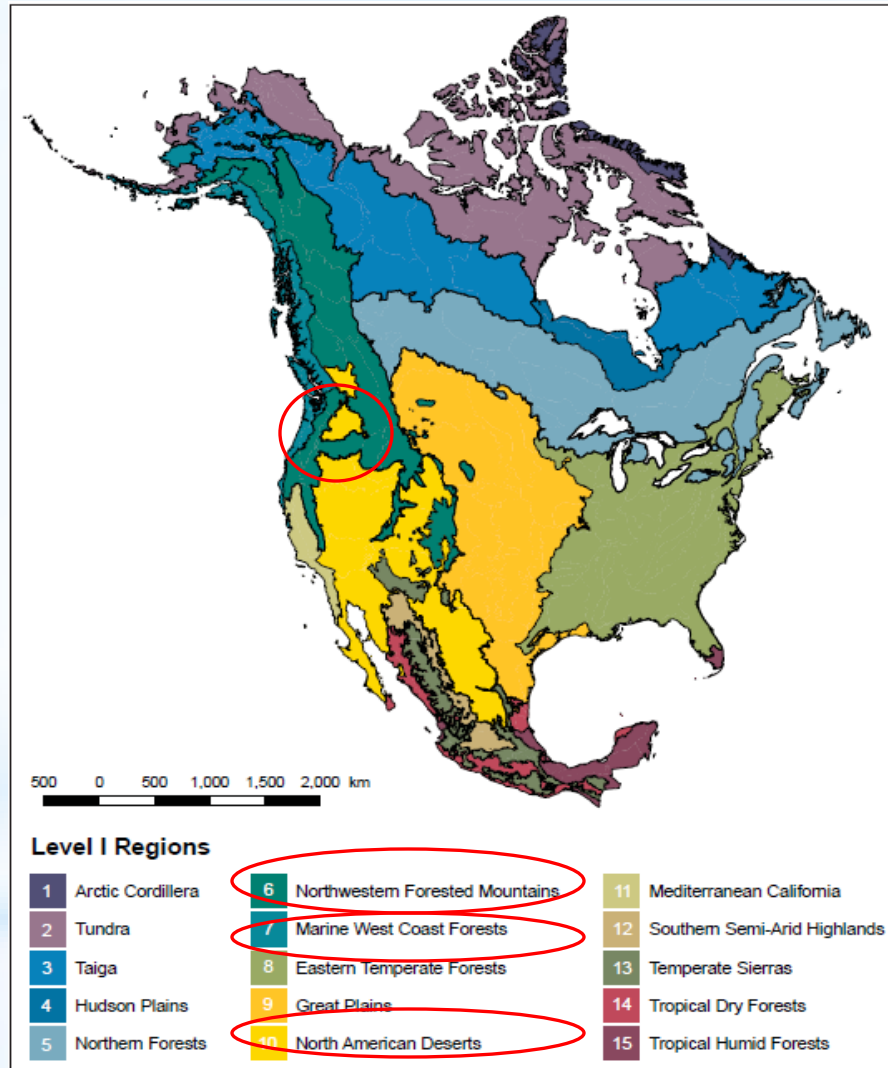
Ecoregions in North America



From the Commission for Environmental Cooperation, 1997



Ecoregions in North America



From the Commission for Environmental Cooperation, 1997

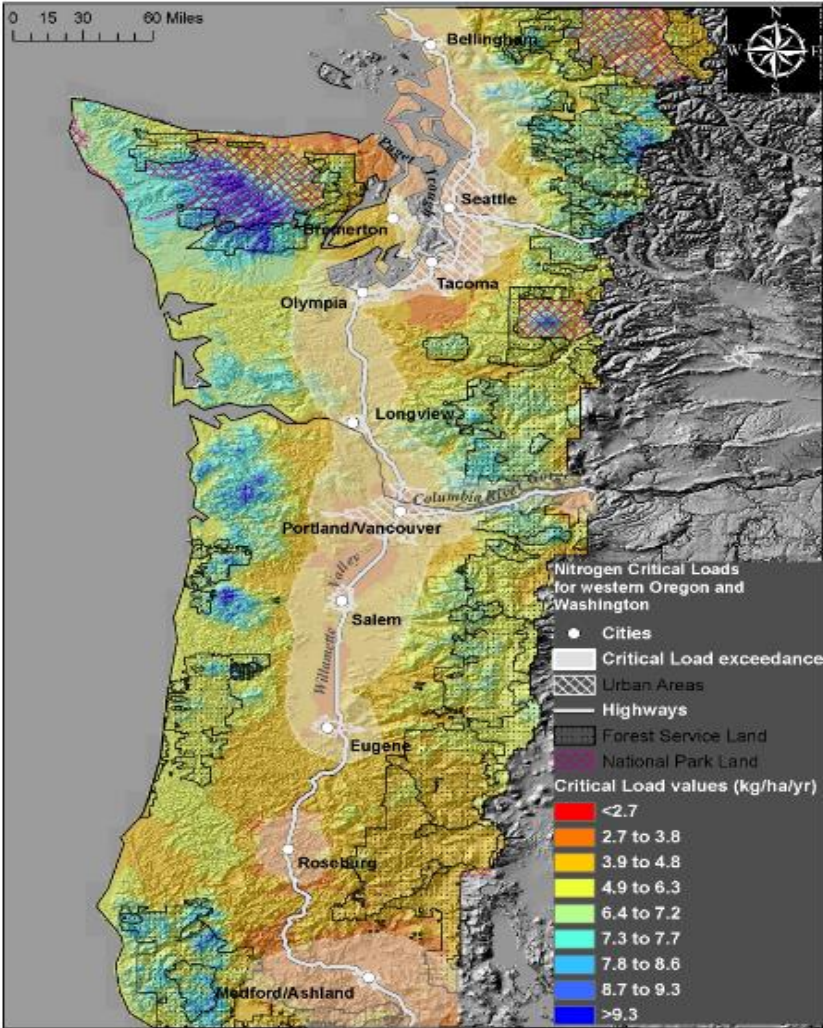


Strategy

- Objective 2 - Using available information about CLs, identify N TLs for USFS and NPS areas in the Pacific Northwest.
 - The USFS and NPS will develop and follow a common rationale for identifying TLs but recognize we may select different TLs based on each agency's management objectives.
 - **Target Date: June 2014**
- Objective 3 - Develop maps showing USFS and NPS areas that exceed N CLs and/or TLs.
 - **Target Date: June 2015**



N CLs for Lichen Communities



Produced by Geiser and Glavich, 2012



Strategy

- Objective 4 - Solicit and incorporate input from stakeholders (e.g., forest supervisors and park superintendents, state and local air quality agencies and U.S. EPA) on identified N CLs, TLs and exceedance maps.
 - Target Date: June 2016
- Objective 5 - Implement use of N CLs and TLs through each agency's planning and policy mechanisms.
 - Target Date: Ongoing



Strategy

- Objective 6 - Identify the sources that contribute to N CL and/or TL exceedances and work with regulatory agencies to achieve emission reductions.
 - **Target Date: Beginning December 2017**
- Objective 7 - Refine N CLs and TLs as new information becomes available.
 - Current projects in the Pacific Northwest include refinement of lichen CLs, a subalpine vegetation fertilization study, a lakes enrichment experiment and biogeochemistry modeling.
 - **Target Date: Ongoing**



CAVEAT

We consider the strategy a living document and fully expect there will be some fine-tuning as we work through the process....



Questions?



Tonnie_Cummings@nps.gov, 360-816-6201

