

## H.J. Andrews Experimental Forest (AND)

**The mission** of the Andrews Forest program is to support basic and applied ecological research, especially long-term studies concerning forests, streams, and watersheds; create and maintain strong linkages among research, education, and forest management; and provide education and public outreach in ecosystem science and natural resource management.

### Site Description and Characteristics:

The H.J. Andrews Experimental Forest is situated in the western Cascade Range of Oregon in the 15,800-acre (6400-ha) drainage basin of Lookout Creek, a tributary of Blue River and the McKenzie River. Elevation ranges from 1350 feet (410 m) to 5340 feet (1630 m). Broadly representative of the rugged mountainous landscape of the Pacific



Northwest, the Andrews Forest contains excellent examples of the region's conifer forests and associated wildlife and stream ecosystems.

The Andrews Forest is administered cooperatively by the USDA Forest Service's Pacific Northwest Research Station, Oregon State University and the Willamette National Forest. Funding for the research program comes from the National Science Foundation (NSF), Pacific Northwest Research Station (PNW), Oregon State University, and other sources. The Andrews Forest is one of the 24 major ecosystem research sites in the United States funded through NSF's Long-Term Ecological Research (LTER) Program.

**Research Focus:** Several distinctive aspects of the Andrews Forest environment and research program have placed it center stage in the science and policies of natural resource management in the region. Basic watershed research in the Pacific Northwest has its roots in small watershed experiments involving forestry treatments initiated in the 1950s. The forest contains extensive examples of old-growth (500 year old) forests which were subject of intensive basic research beginning in the 1970s. The original work on northern spotted owl and its relations with forest habitat was conducted at the Andrews in the 1970s, setting the stage for extensive monitoring studies that continue. Studies of carbon cycling over the past two decades have revealed the exceptional properties of Pacific Northwest forests at the scale of a single tree to the region in terms of carbon sequestration. The Andrews Forest serves as a science benchmark for each of these themes and thus has been examined in terms of its regional context and representativeness.

Nearly 60 years of research at the Andrews Forest has encompassed many themes, balancing persistent examination of key science themes and applied forest and stream management.



**The central question** currently guiding the Andrews Forest LTER studies is: How do land use, natural disturbances, and climate variability affect three key ecosystem properties: carbon dynamics, biodiversity, and hydrology?

**Persistent Themes in Research include:**

- Carbon storage & dynamics
- Old-growth and plantation forest dynamics: structure, composition
- Wildfire and managed fire
- Large wood in forests, streams
- Forest-stream interactions, riparian guidelines
- Landscape pattern influence on organisms (e.g. spotted owl)
- Long-term fish population dynamics
- Forest harvest, roads, floods, landslides, and water yield
- Insect diversity in streams, forest

**Evolving research themes include:**

- 1948 – Andrews Forest established
- Forestry research
- 1950s - Forest road layout, logging systems for harvesting old-growth forests, and establishment of paired watershed experiments
- 1960s - Effects of logging on water, sediment, and nutrient losses from small watersheds
- Ecosystem and applied research
- 1970s - International Biological Program, forest and stream ecosystems
- 1980s - LTER initiated. Forest and stream ecosystem processes, dead wood in forests and streams, ecosystem management
- 1990s - Revisit long-term paired watersheds, stream temperature, applied silviculture, landscape ecology, floods
- 2000s – New & continuing science: Airshed & atmospheric landscape, carbon/nitrogen dynamics in soil and small watersheds, social science, math, engineering

