# Virtual Field Trip: Temperate Rain Forest



**Douglas Fir and Western Hemlock forest, Roslyn, Wa.**

# Virtual Field Trip: Temperate Rain Forest



Douglas Fir and Western Hemlock forest, Roslyn, Wa.

**Topics**
- **Location**
- **Controlling factors**
- **Climate**
- **Soil/topography**
- **Description of vegetation and wildlife**
- **Unique ecological properties**
- **Climate change**
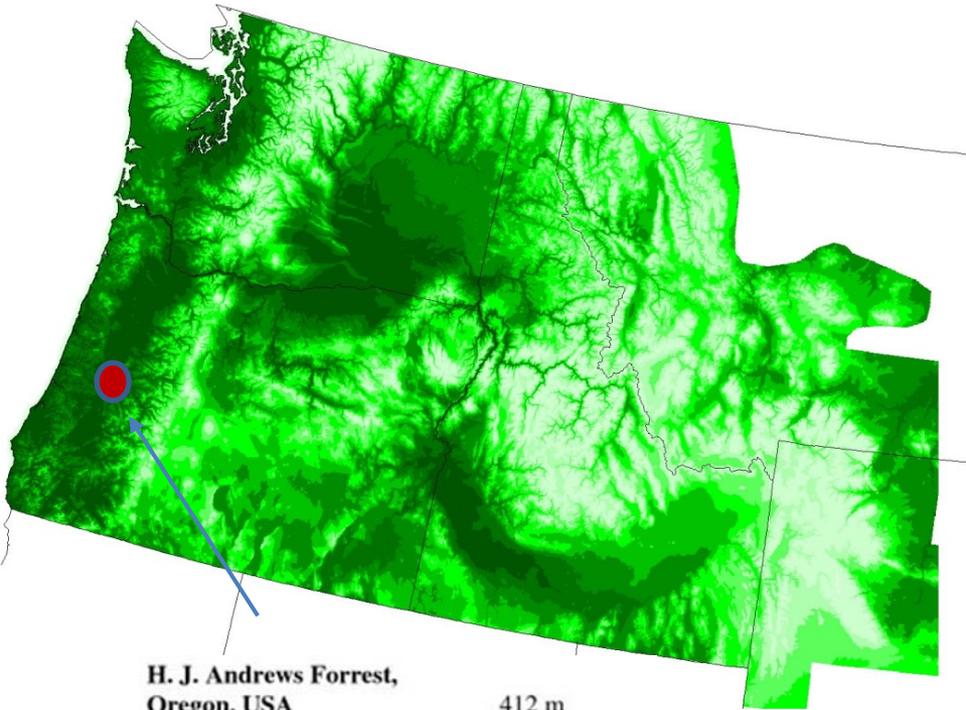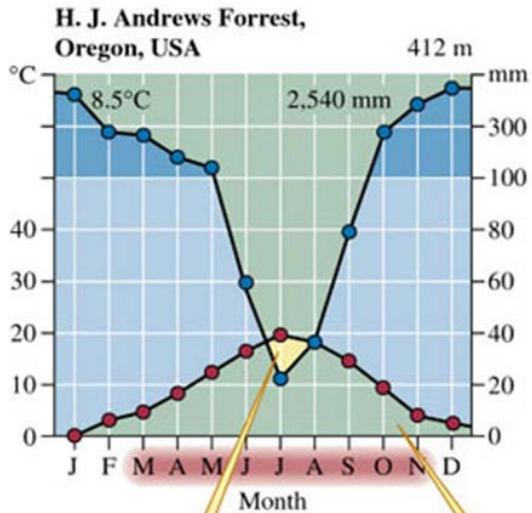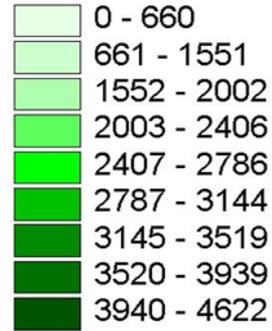- **Interactions with peoples and management**

# Location





**Knysna Forest Biome near Nature's Valley, in the Tsitsikamma, South Africa**

# Climate



Growing degree days

- 0 - 660
- 661 - 1551
- 1552 - 2002
- 2003 - 2406
- 2407 - 2786
- 2787 - 3144
- 3145 - 3519
- 3520 - 3939
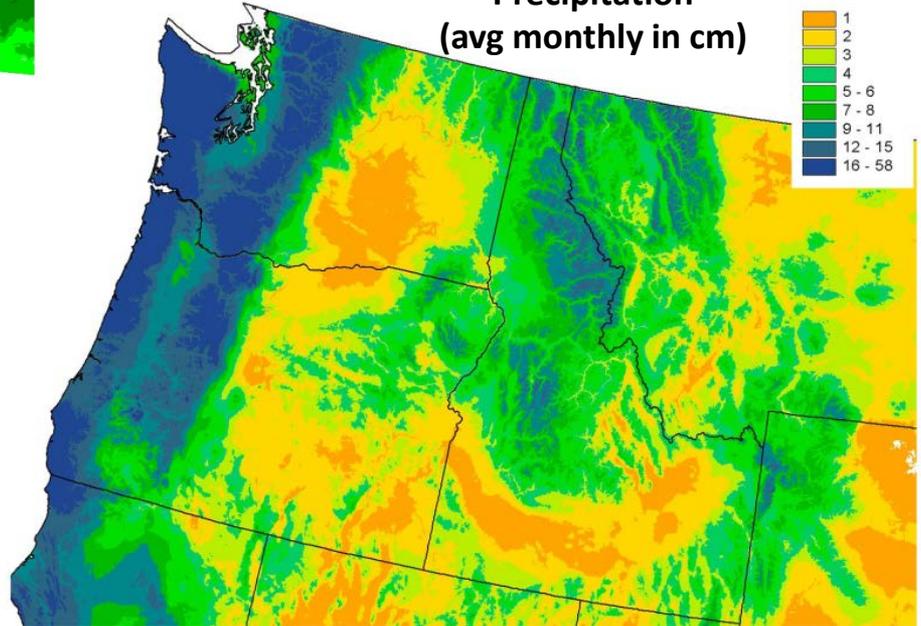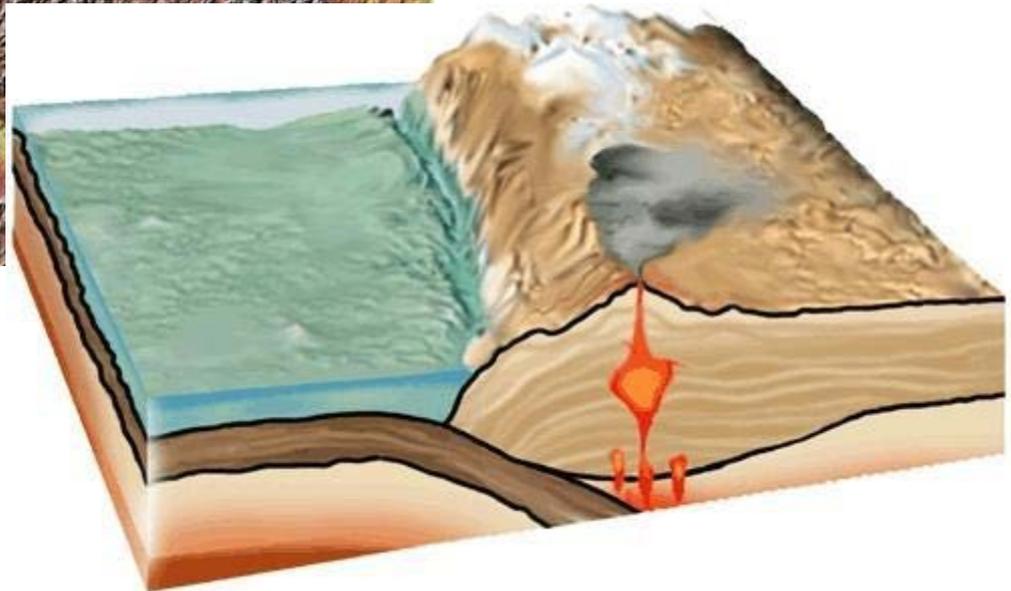- 3940 - 4622

**H. J. Andrews Forrest, Oregon, USA**    412 m

8.5°C    2,540 mm

Temperate coniferous forests are associated with seasonal drought.

Moderate v

**Precipitation (avg monthly in cm)**

- 1
- 2
- 3
- 4
- 5 - 6
- 7 - 8
- 9 - 11
- 12 - 15
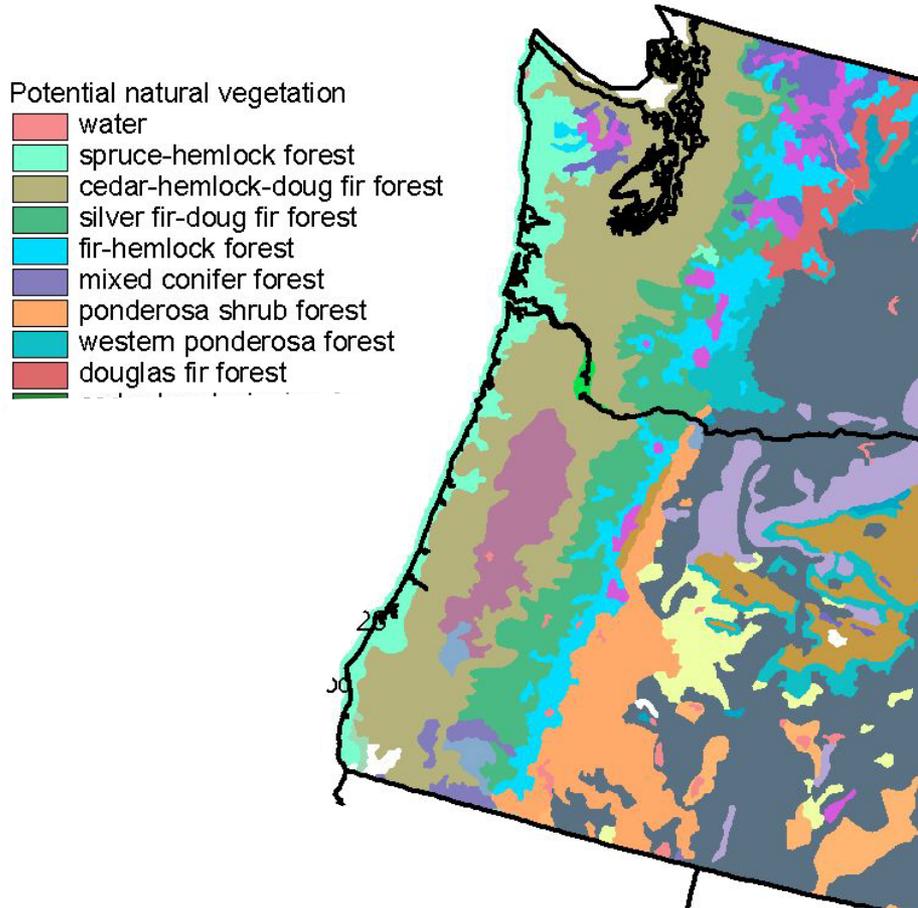- 16 - 58

# Oceanic and Geomorphic Effects
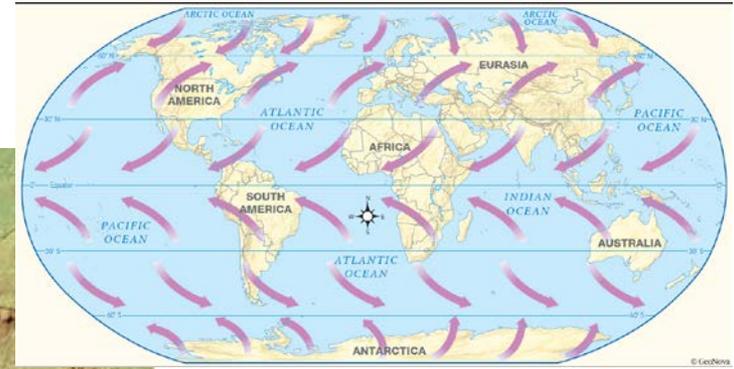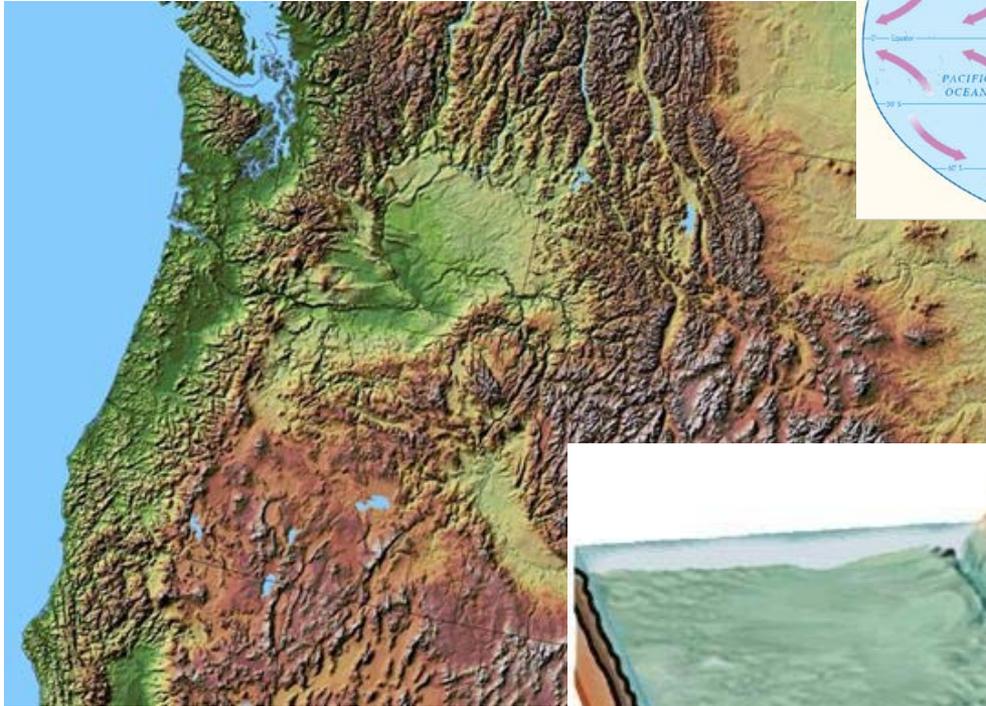
# Vegetation Composition

**Douglas Fir and Western Hemlock forest, Roslyn, Wa.**

**Needle-leaved evergreen**

# Vegetation Composition

**Potential natural vegetation**
- water
- spruce-hemlock forest
- cedar-hemlock-doug fir forest
- silver fir-doug fir forest
- fir-hemlock forest
- mixed conifer forest
- ponderosa shrub forest
- western ponderosa forest
- douglas fir forest

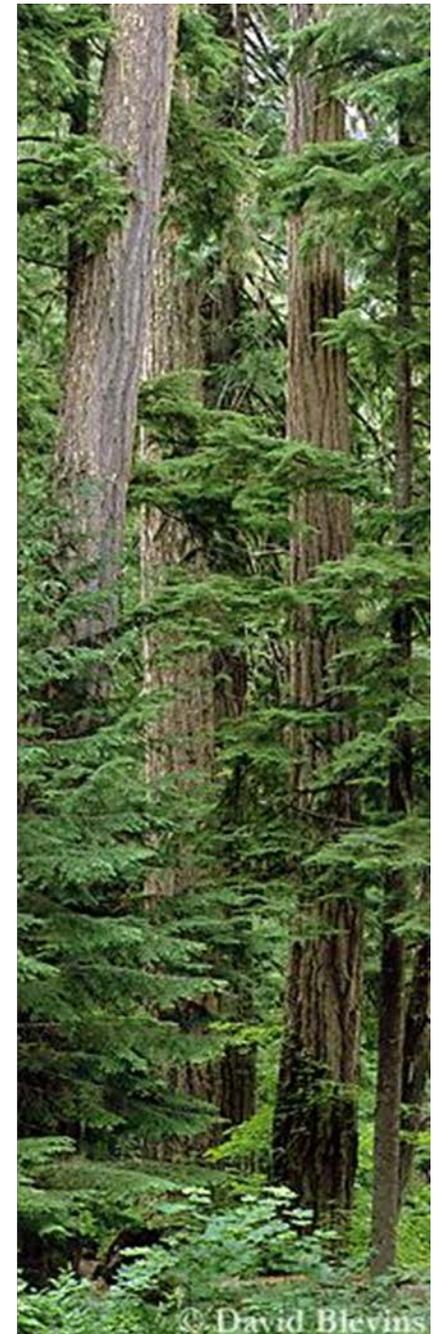**Kuchler's Potential Natural Vegetation**

Spruce-Hemlock forest and Umpqua River Lighthouse. Oregon, USA

# Vegetation Structure



**Douglas Fir forest, Springfield, OR.**

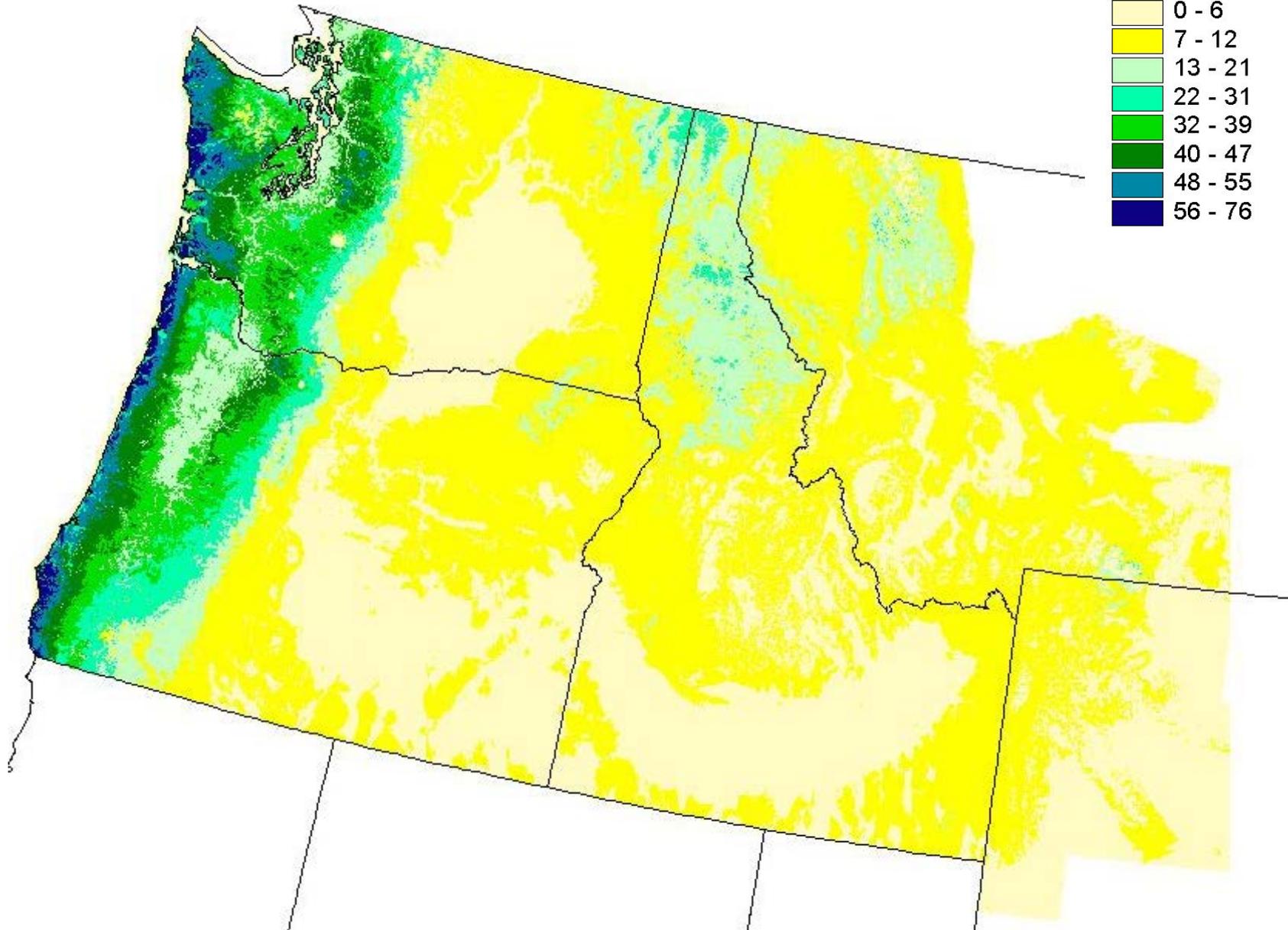# Epiphytes

# Vegetation Productivity
## (MgC ha-1 yr-1)

3PG GPP total
- 0 - 6
- 7 - 12
- 13 - 21
- 22 - 31
- 32 - 39
- 40 - 47
- 48 - 55
- 56 - 76
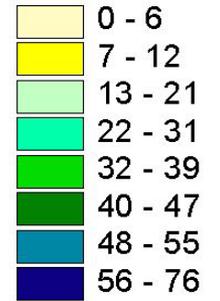
# Natural Disturbance



**Cascade Creek fire on the southwest flank of Mount Adams. Sept 2012**

# Natural Disturbance



**Frequency: none** ⟶

**Frequency: 250-500 yrs**
**Severity: high**
**Size: large**

**Frequency: 50-90 yrs**
**Severity: low**
**Size: small**

**Fire in the PNW**

# Vegetation Succession



## Forest Development Following Moderate Severity Wildfire

240'
160'
80'

FIRE    70    150    250    500    750

HERB-    YOUNG    MATURE    EARLY    MIDDLE    LATE
SHRUB                        OLD GROWTH    OLD GROWTH    OLD GROWTH



Grass-    Shrub-    Pole-    Young    Mature    Old-
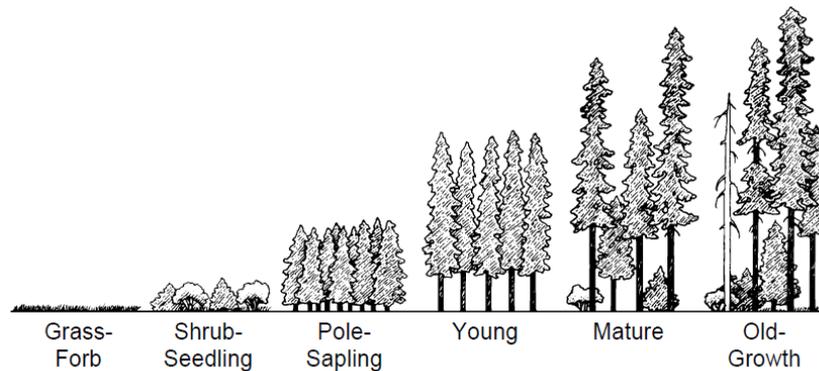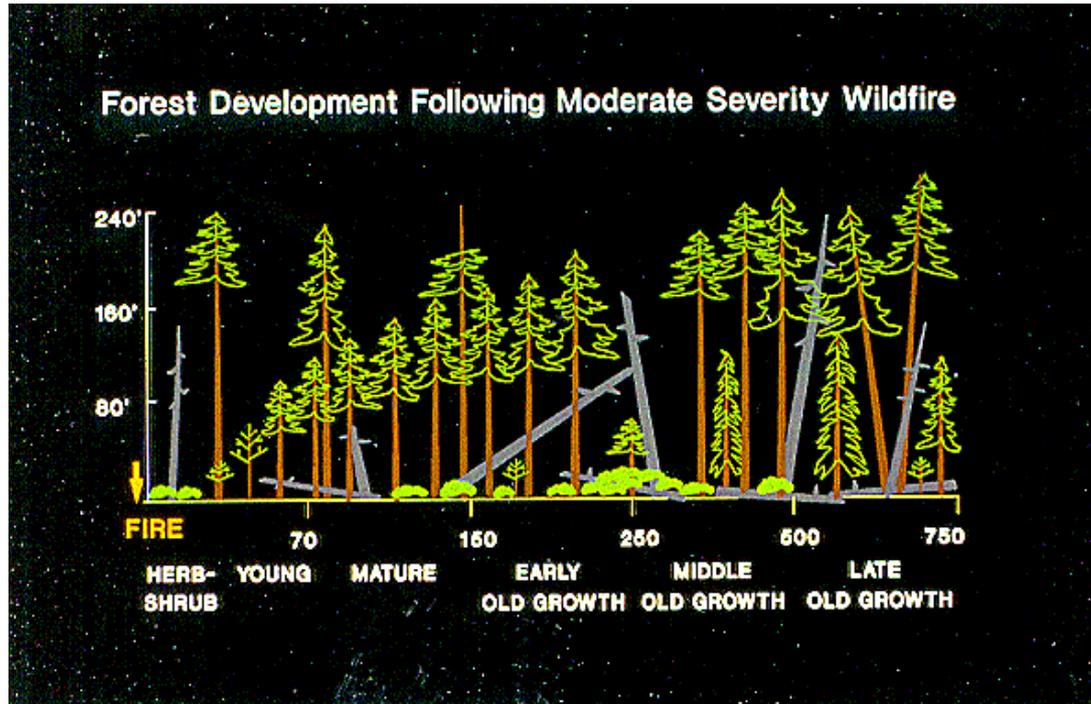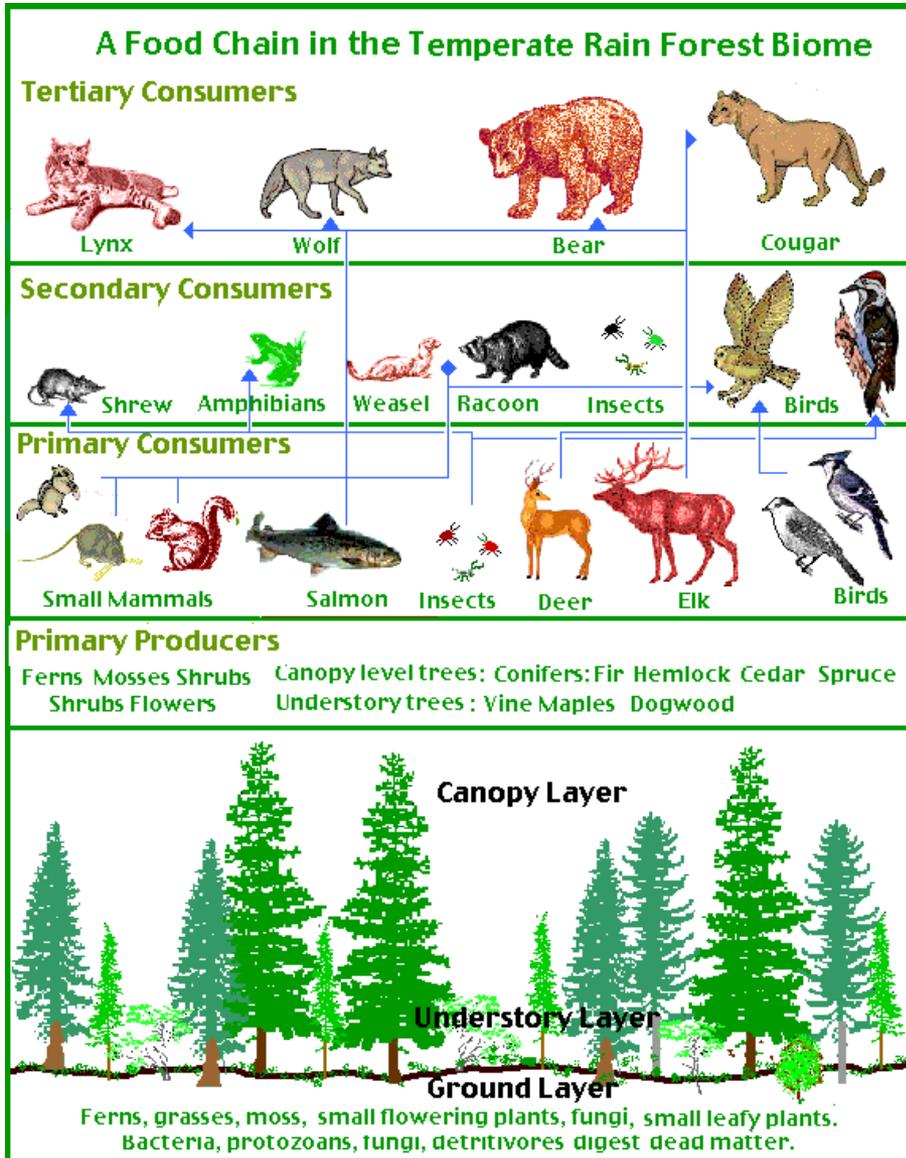Forb      Seedling  Sapling                     Growth

**Figure 1** – Successional stages for coniferous forest ecosystems (adapted from

# Species and Trophic relationships

## A Food Chain in the Temperate Rain Forest Biome

**Tertiary Consumers**

Lynx    Wolf    Bear    Cougar

**Secondary Consumers**

Shrew    Amphibians    Weasel    Racoon    Insects    Birds

**Primary Consumers**

Small Mammals    Salmon    Insects    Deer    Elk    Birds

**Primary Producers**

Ferns Mosses Shrubs    Canopy level trees: Conifers: Fir Hemlock Cedar Spruce
Shrubs Flowers    Understory trees : Vine Maples Dogwood

**Canopy Layer**

**Understory Layer**

**Ground Layer**
Ferns, grasses, moss, small flowering plants, fungi, small leafy plants.
Bacteria, protozoans, fungi, detritivores digest dead matter.
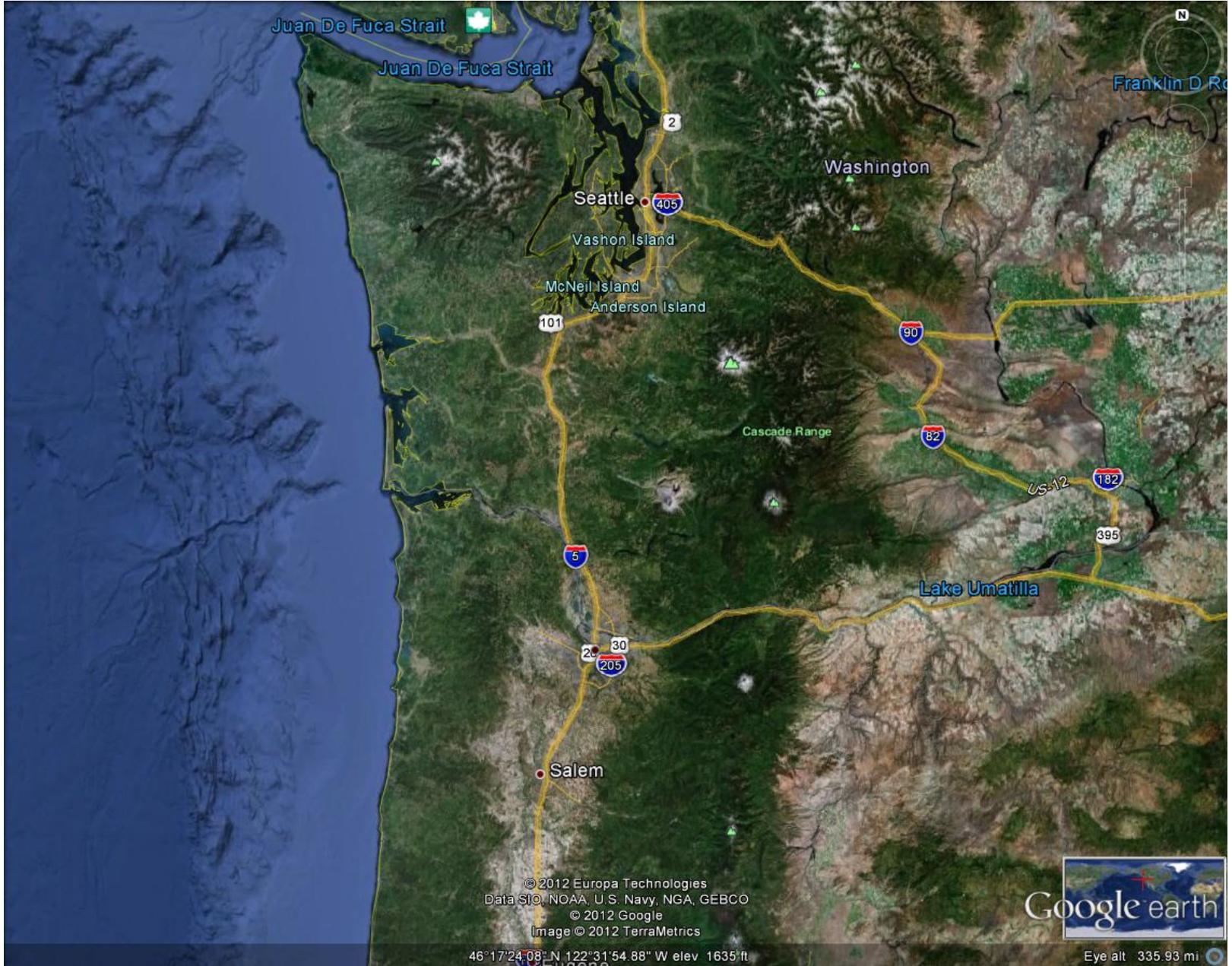
Pacific Yew

Western Redcedar

Pacific Giant Salamander

Northern Spotted Owl

# Land Use

# Marine/Terrestrial Interactions and Land Use

# Land Use









Larry D Harris

The Fragmented Forest

Island Biogeography Theory and the Preservation of Biotic Diversity

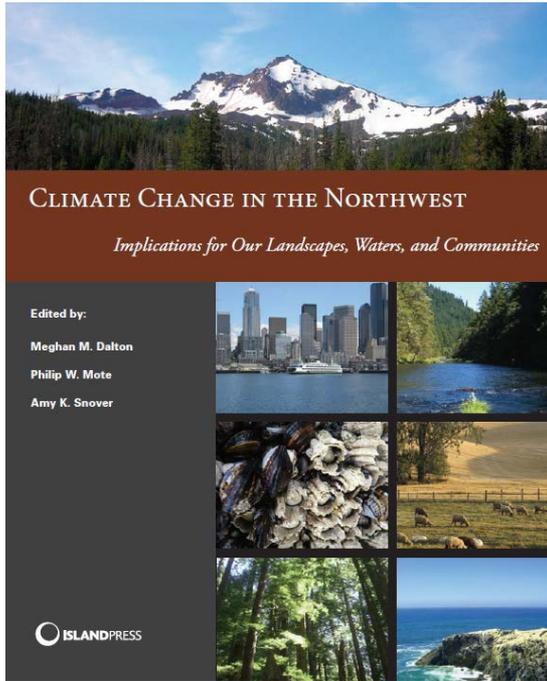With a Foreword by Kenton R. Miller
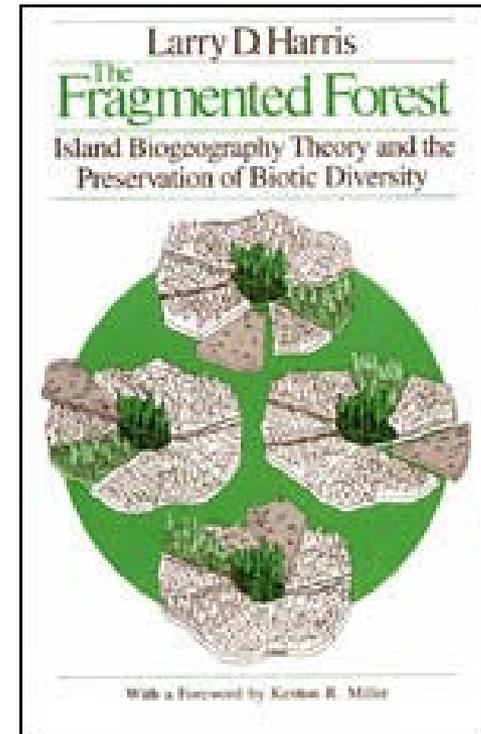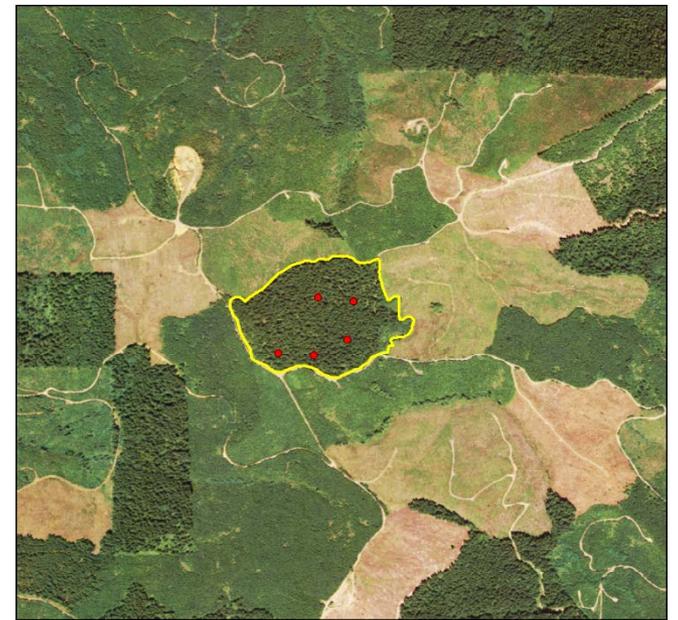
# Ecological Forestry



**Loren Hicks, Plum Creek**

**Jerry Franklin, Univ Washington**

# Climate Change



Temperature Change
NARCCAP, SRES A2

Multi-model mean simulated difference
(2041-2070 minus 1971-2000)

Change

+2.5°F          +6.0°F

+1.4°C          +3.3°C

Annual