Swiss Needle Cast
Western Oregon Aerial Survey


Hemlock
Doug-fir
Spruce


Alder
Doug-fir


Spruce
Doug-fir
Alder

2010 SNC AERIAL SURVEY

Observers:

- Mike McWilliams (ODF)
- Rob Flowers (ODF)
- Ben Smith (USFS)

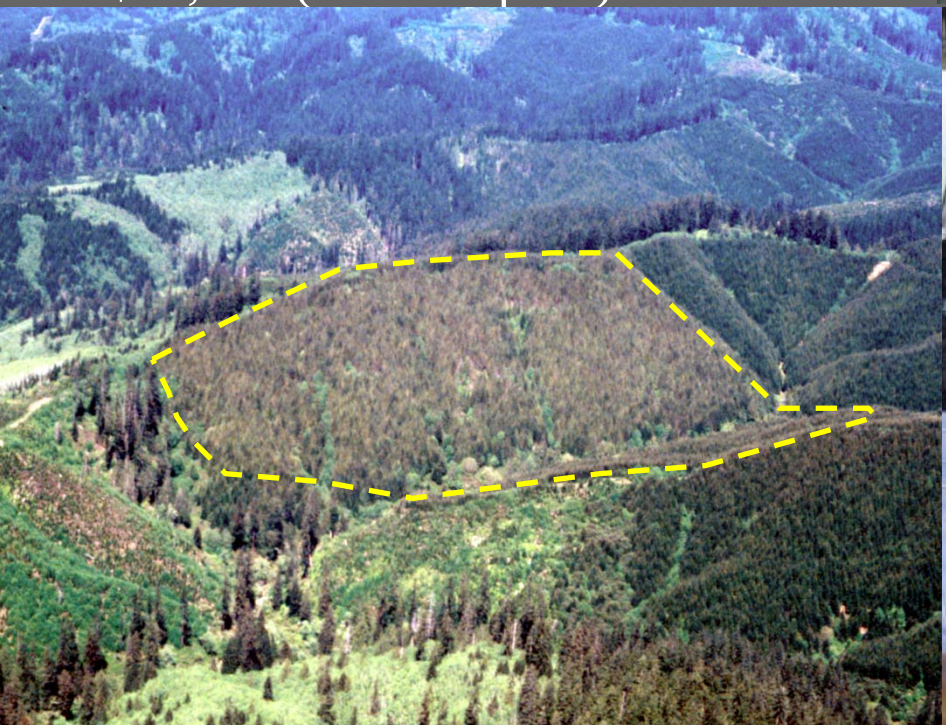
Pilot: Trevor Courtney (ODF)

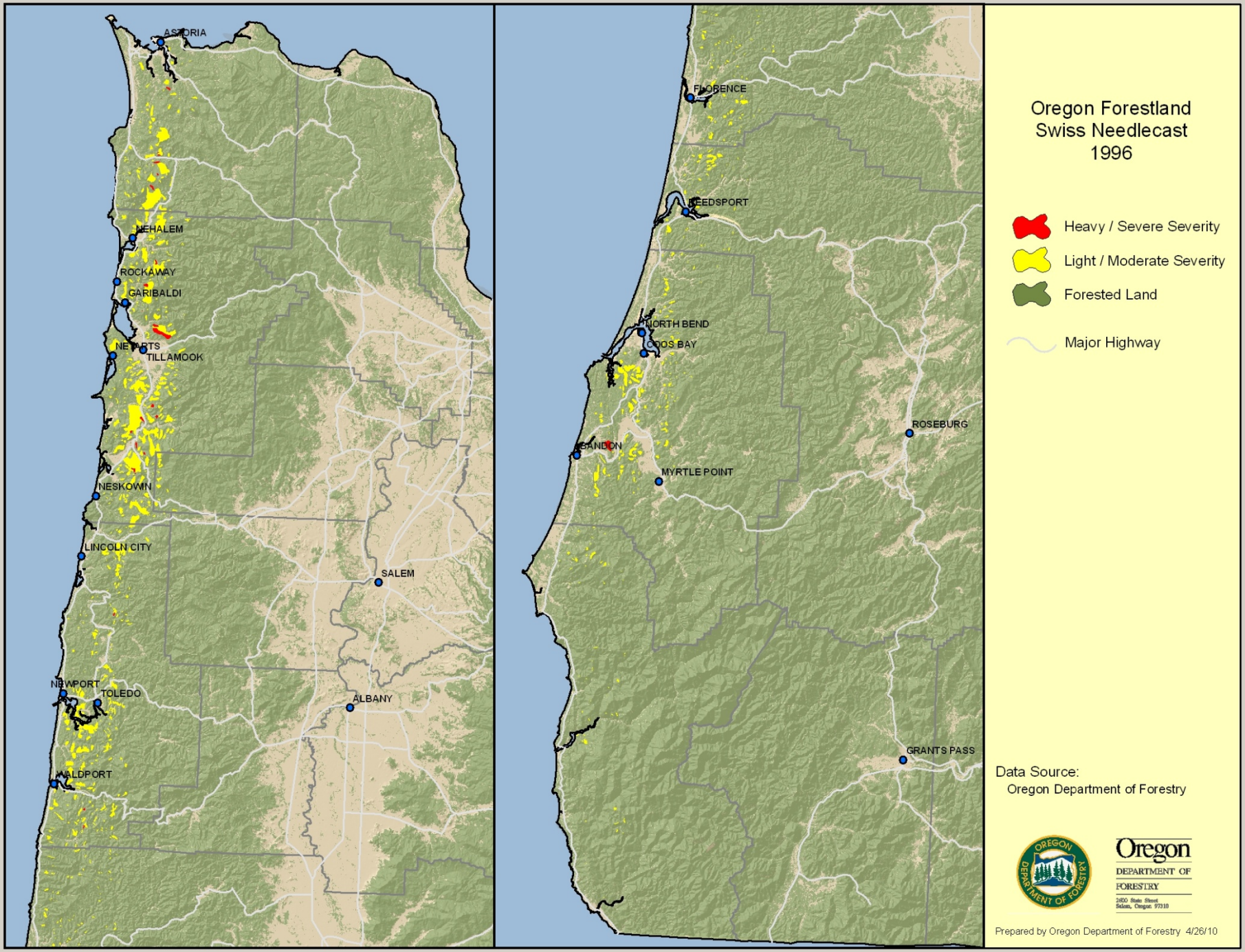
May 13, 14; June 3, 7, 8

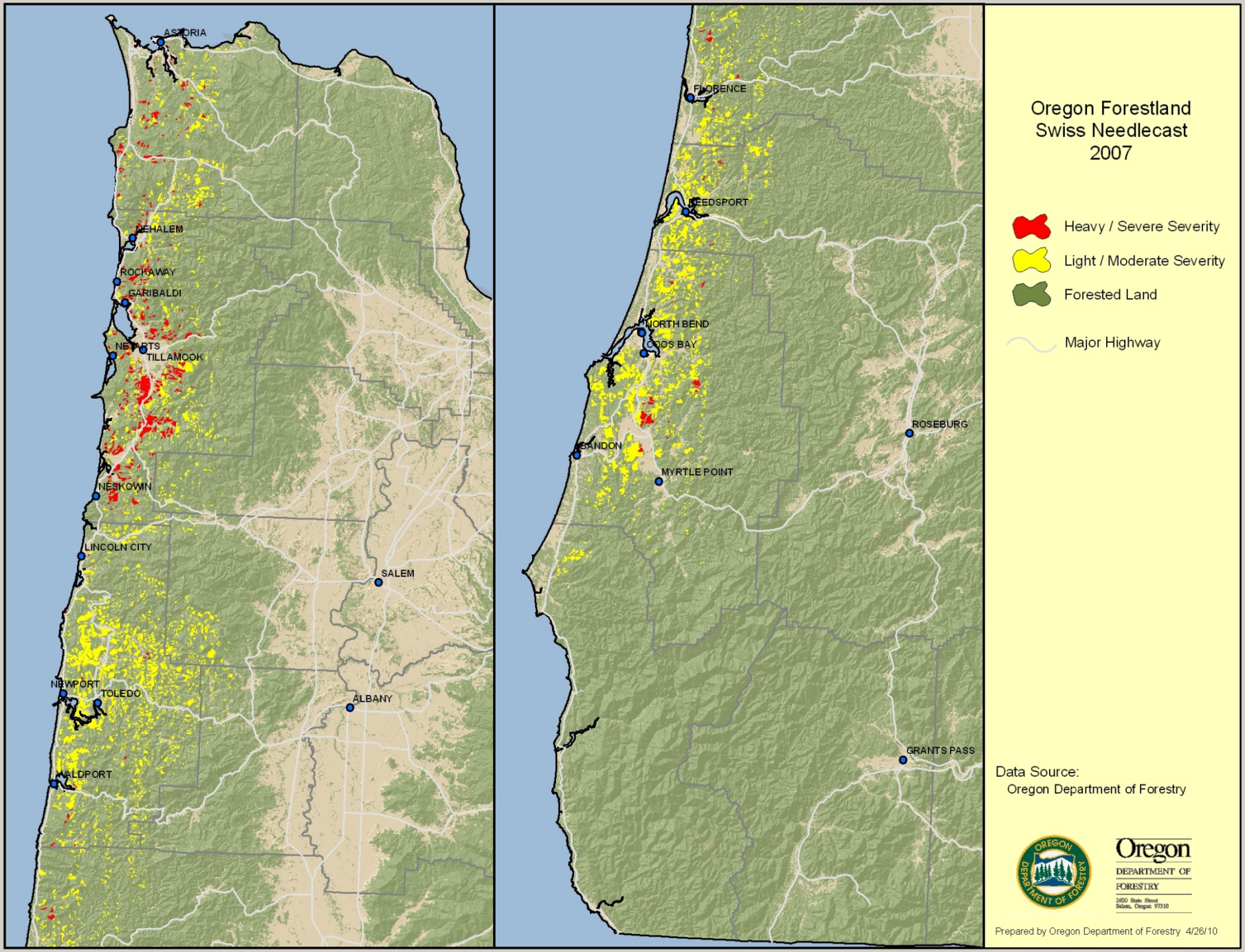
Poor conditions during May

4 million acres

$12,565 (Plane & pilot)




ASTORIA
NEHALEM
ROCKAWAY
GARIBALDI
NEWPORTS
TILLAMOOK
NESKOWIN
LINCOLN CITY
SALEM
NEWPORT
TOLEDO
ALBANY
WALDPORT
FLORENCE
REEDSPORT
NORTH BEND
COOS BAY
ROSEBURG
BANDON
MYRTLE POINT
GRANTS PASS
Oregon Forestland
Swiss Needlecast
1996
Heavy / Severe Severity
Light / Moderate Severity
Forested Land
Major Highway
Data Source:
Oregon Department of Forestry
Oregon
DEPARTMENT OF
FORESTRY
2600 State Street
Salem, Oregon 97310
Prepared by Oregon Department of Forestry 4/26/10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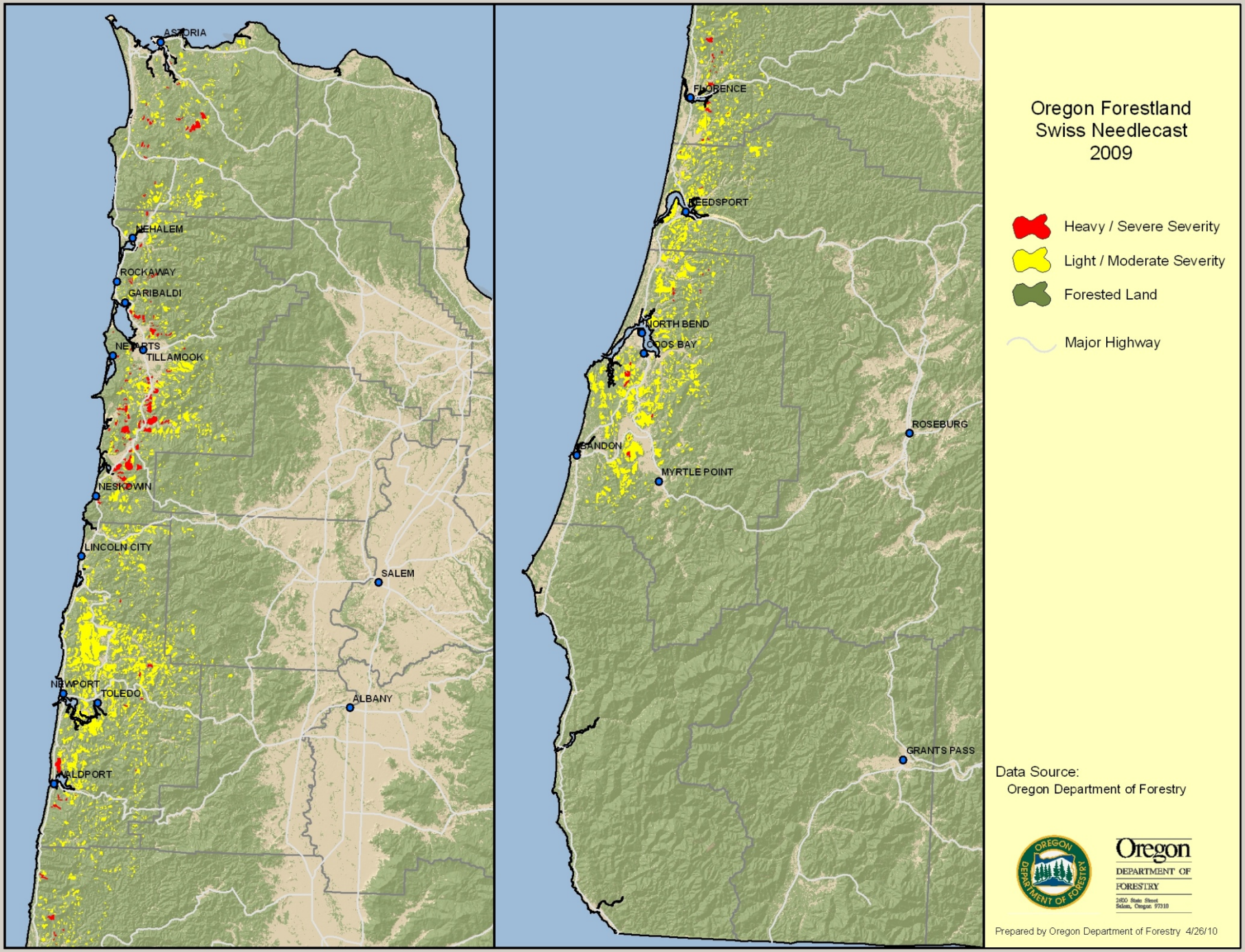
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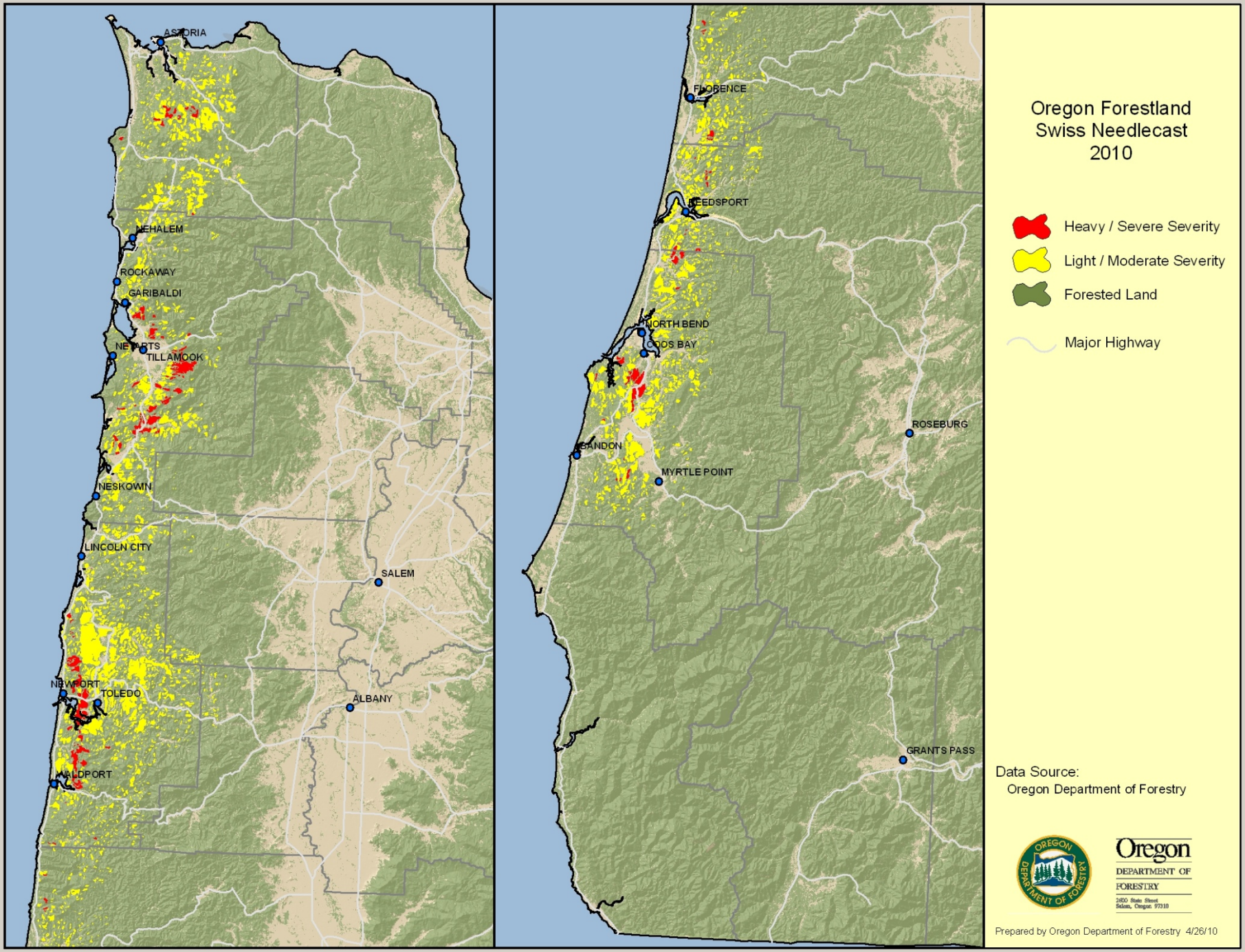
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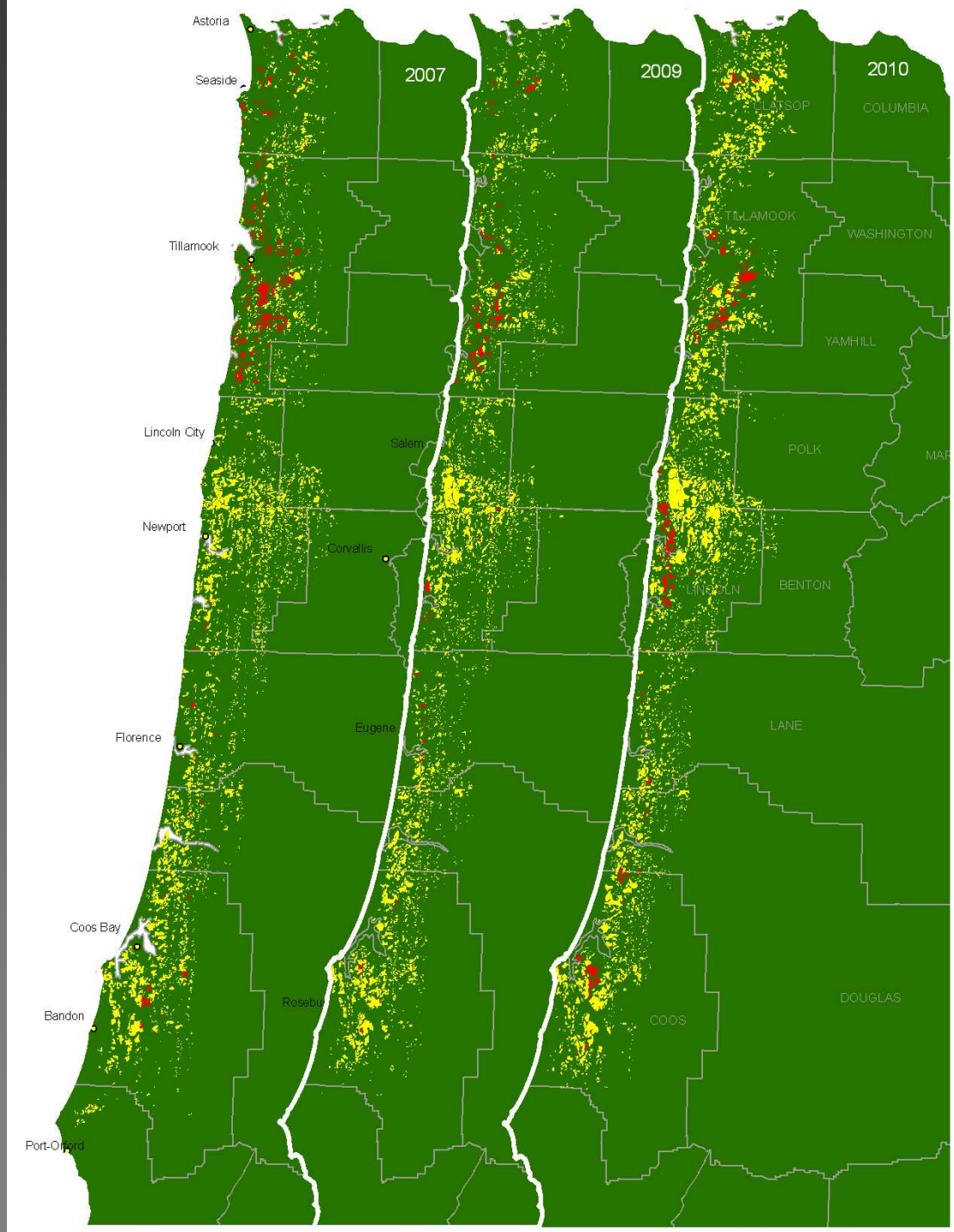
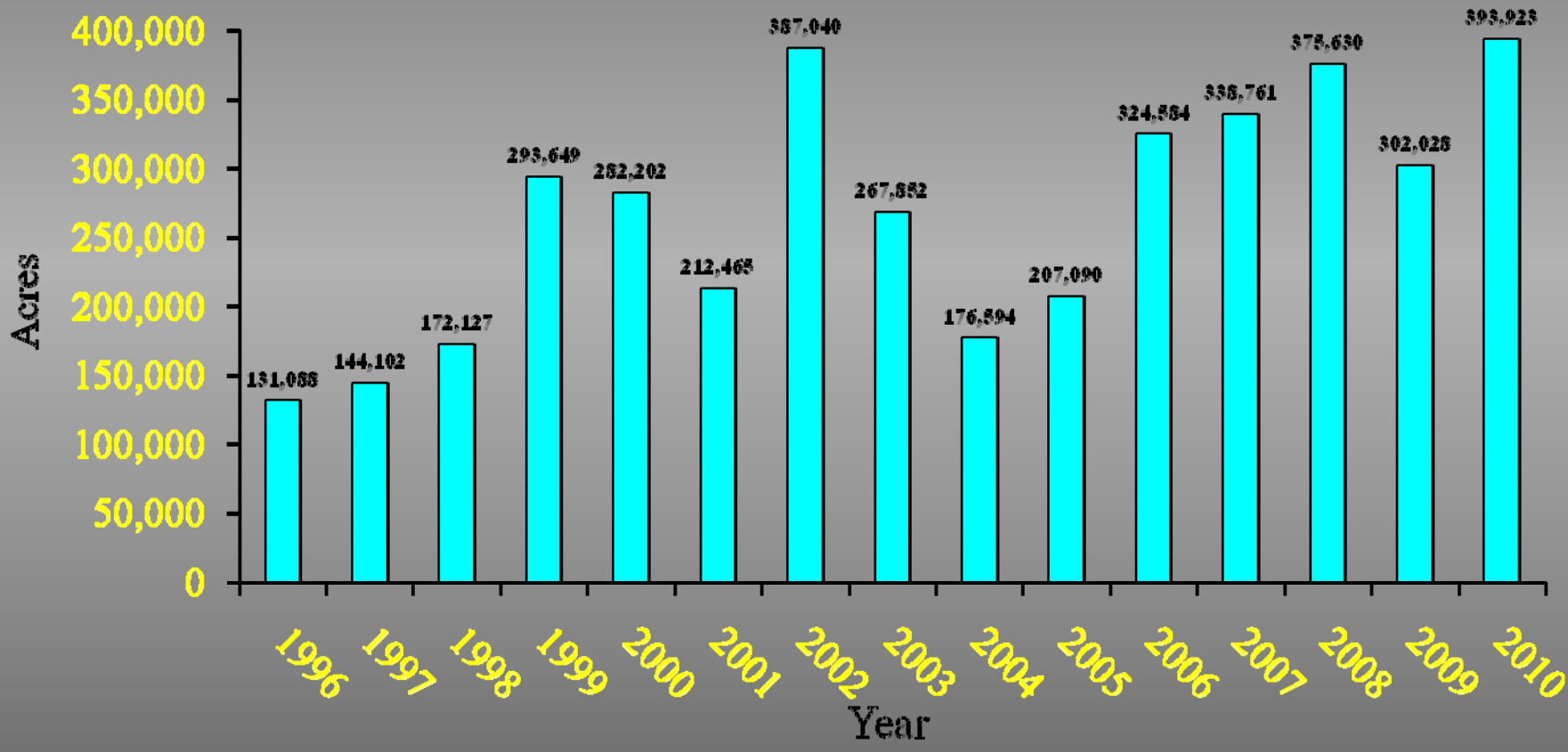
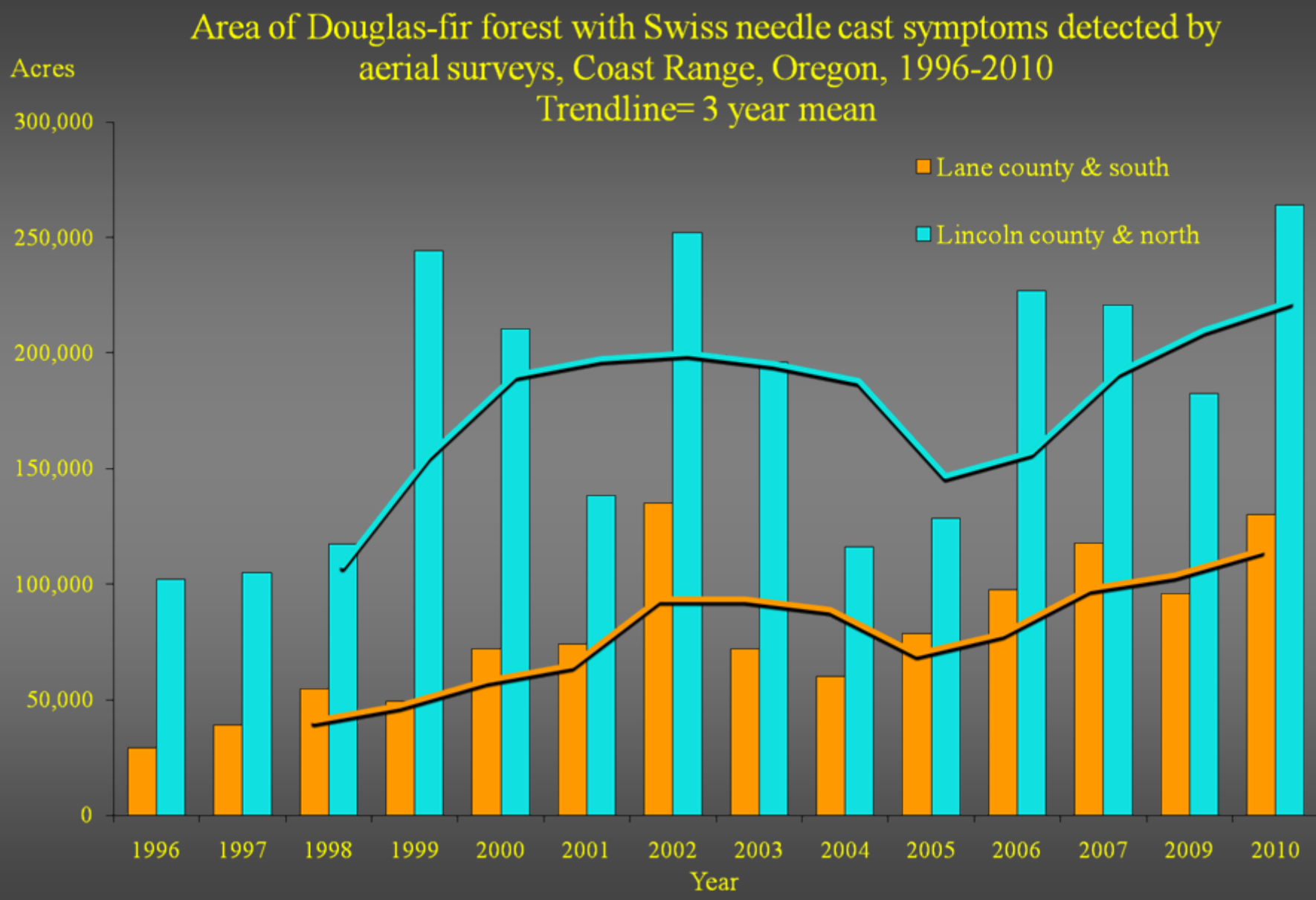
Swiss Needle Cast Aerial Survey 2007-2010

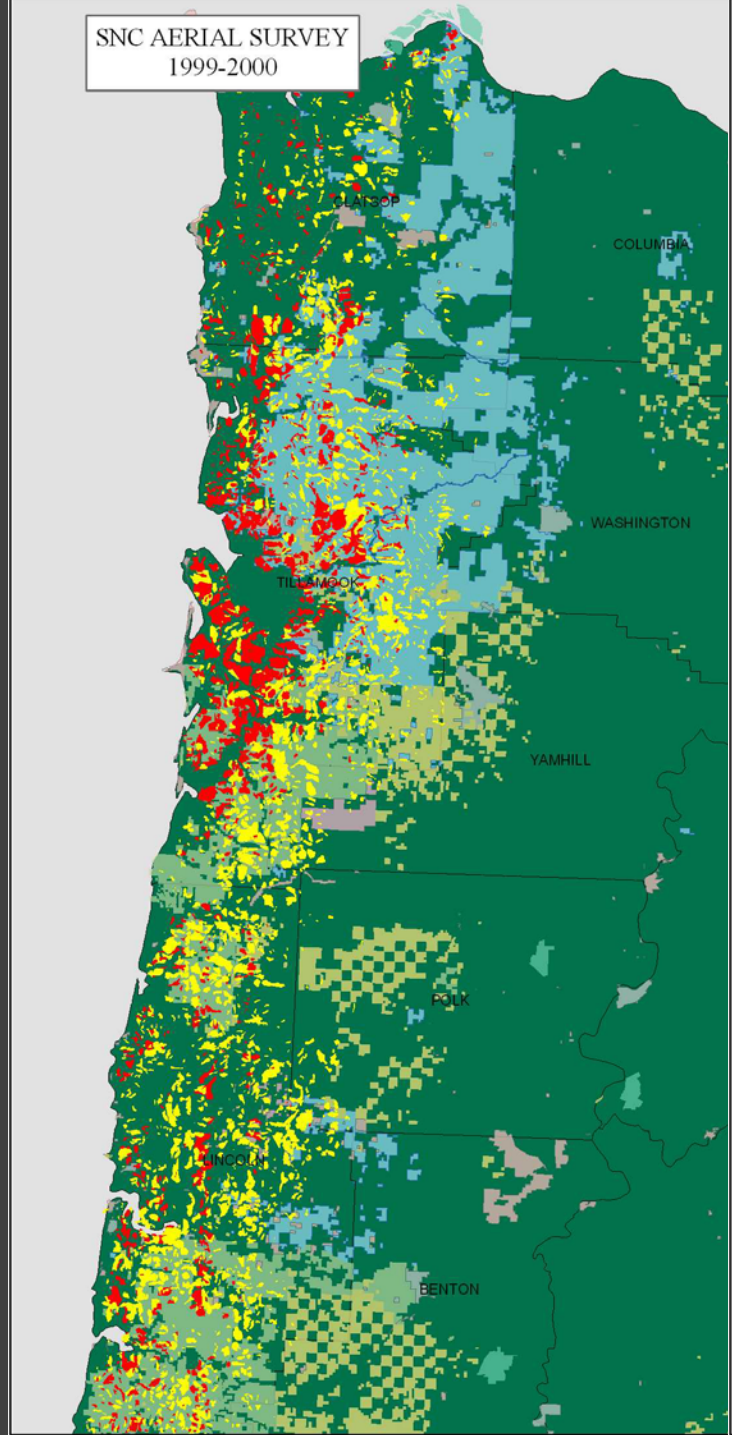


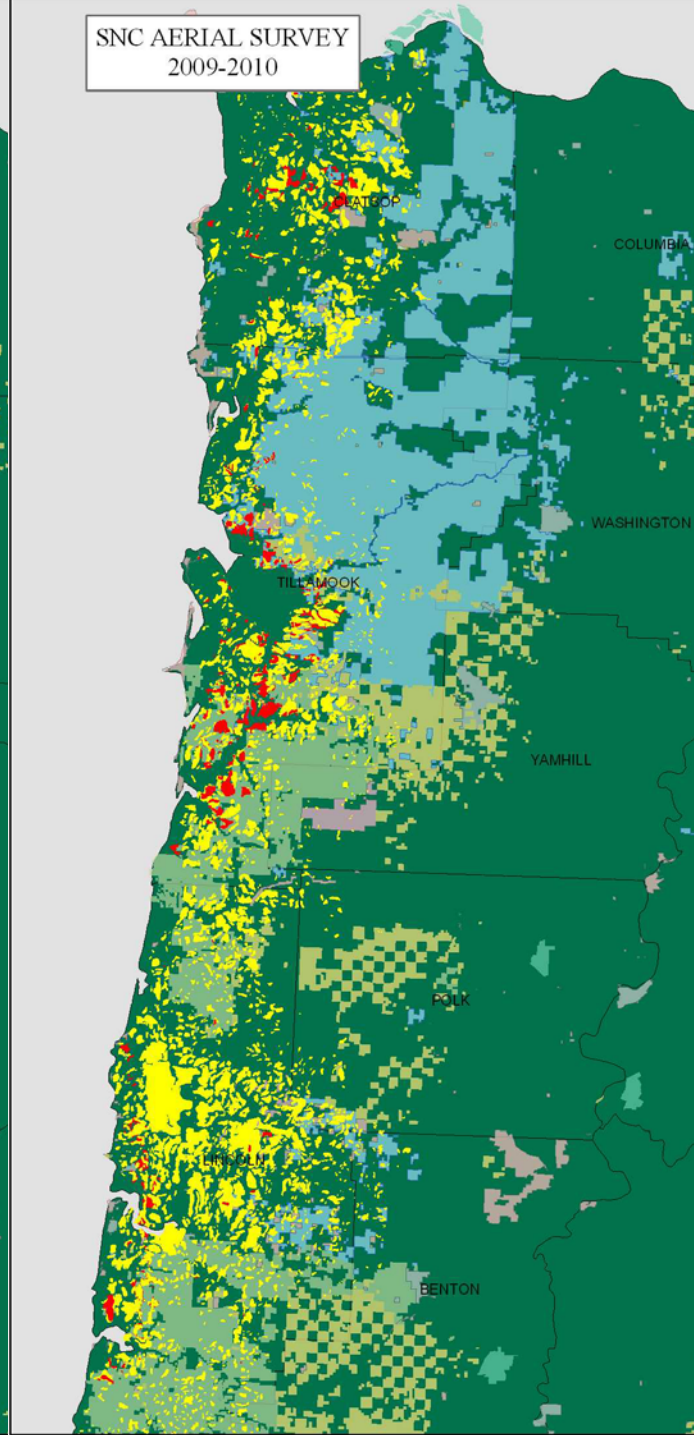
Swiss Needle Cast Aerial Survey 1996-2010



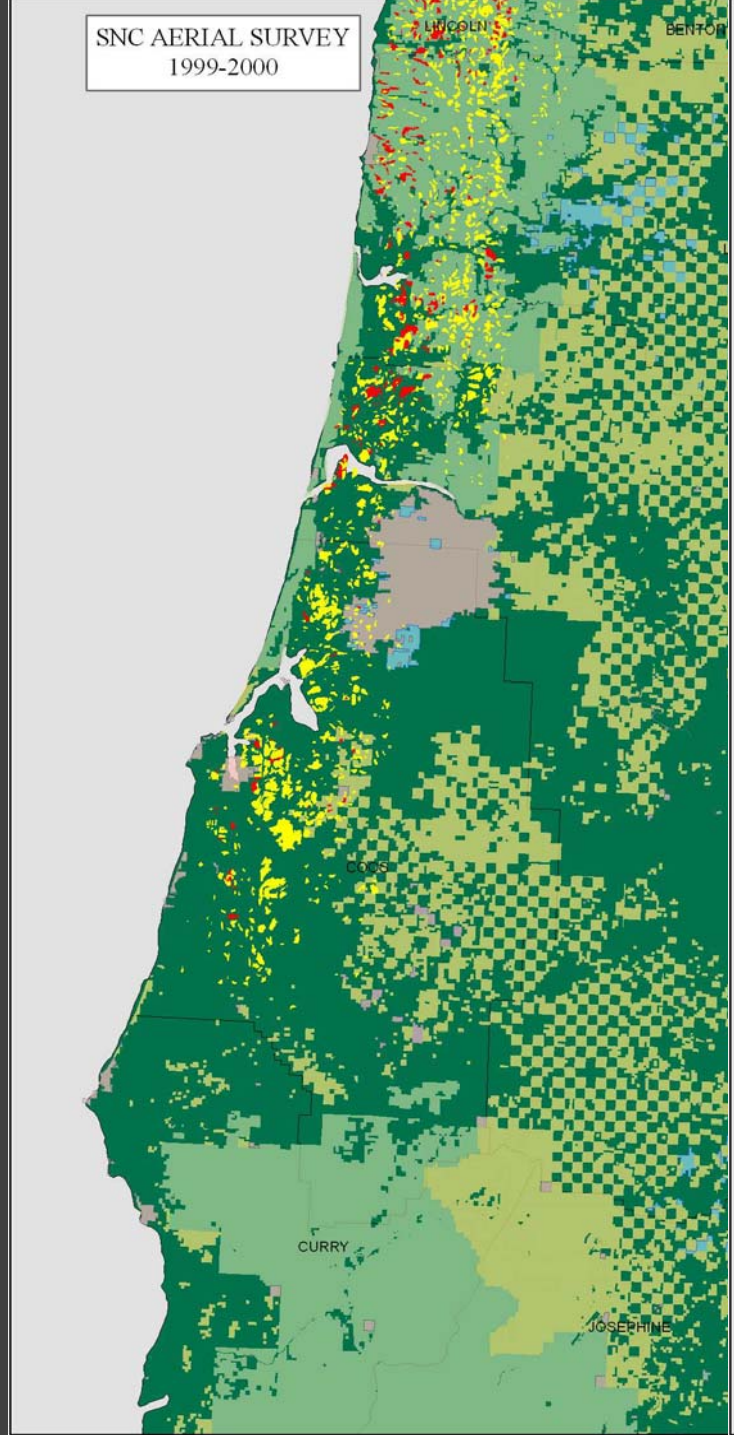

Area of Douglas-fir forest with Swiss needle cast symptoms detected by aerial surveys, Coast Range, Oregon, 1996-2010
Trendline= 3 year mean
Acres
300,000
250,000
200,000
150,000
100,000
50,000
0
Lane county & south
Lincoln county & north
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2009
2010
Year

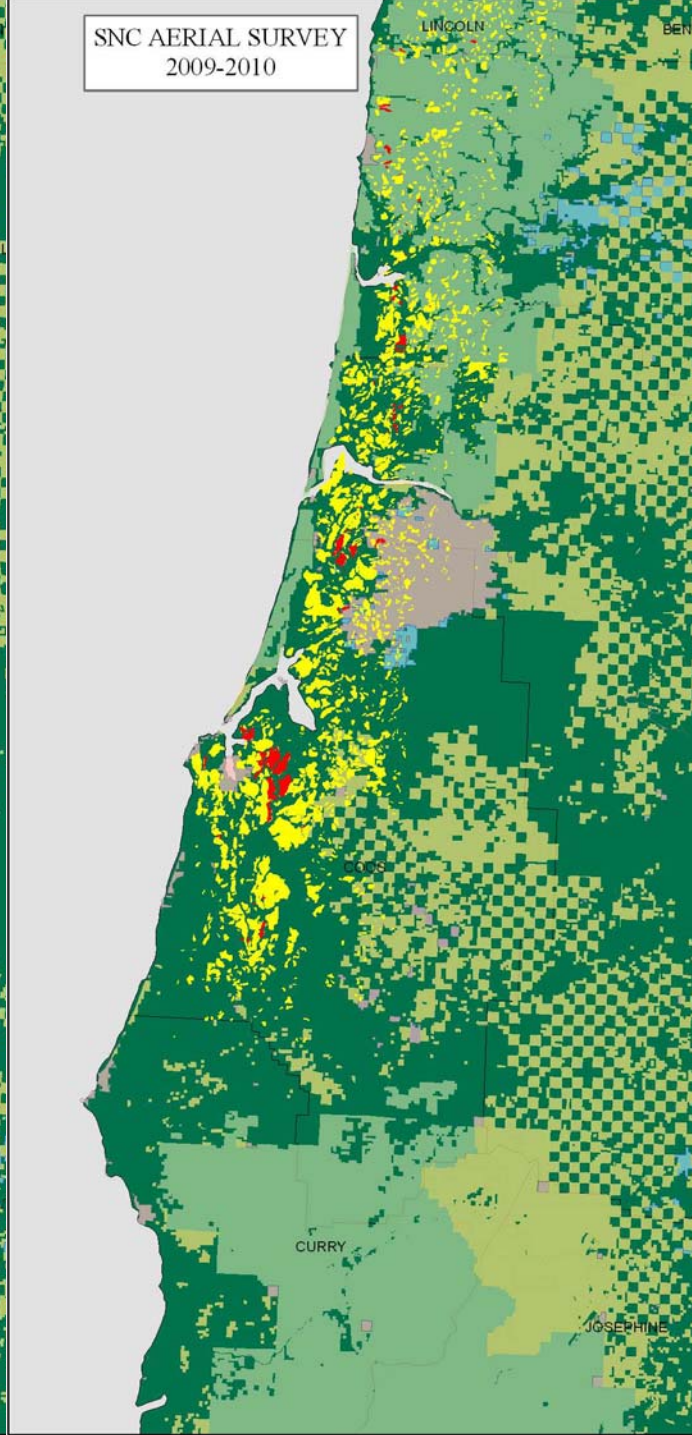
NORTH HALF


SNC AERIAL SURVEY
1999-2000
TILLAMOOK
COLUMBIA
WASHINGTON
YAMHILL
POLK
BENTON

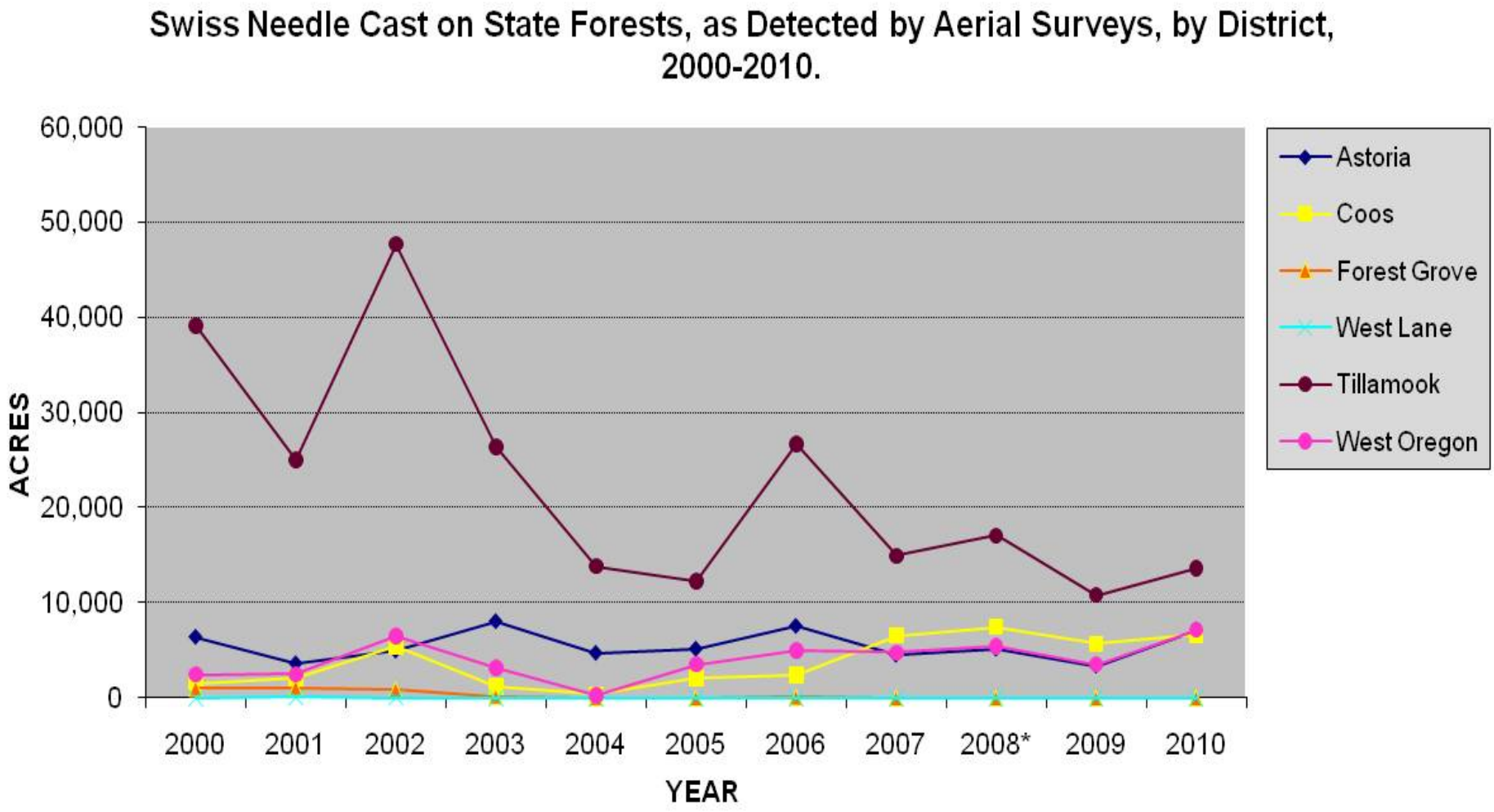

SNC AERIAL SURVEY
2009-2010
COLUMBIA
WASHINGTON
TILLAMOOK
YAMHILL
POLK
BENTON

SOUTH HALF

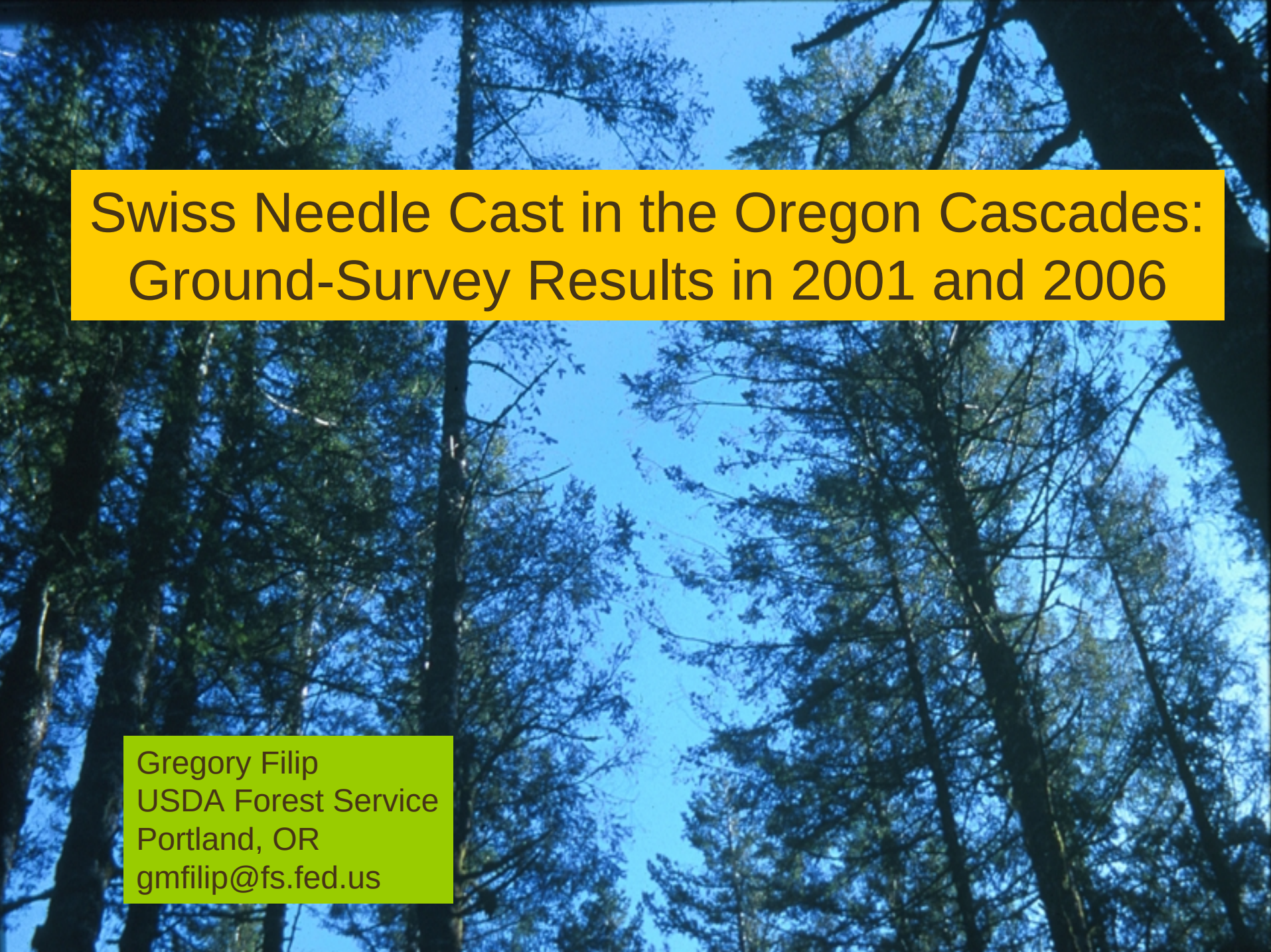

SNC AERIAL SURVEY
1999-2000
LINCOLN
BENTON
COOS
CURRY
JOSEPHINE


SNC AERIAL SURVEY
2009-2010
LINCOLN
COOS
CURRY
JOSEPHINE

Swiss Needle Cast Aerial Survey 1996-2010
State Lands Only



Kastner-Dutton Plot, Tillamook



Swiss Needle Cast in the Oregon Cascades: Ground-Survey Results in 2001 and 2006

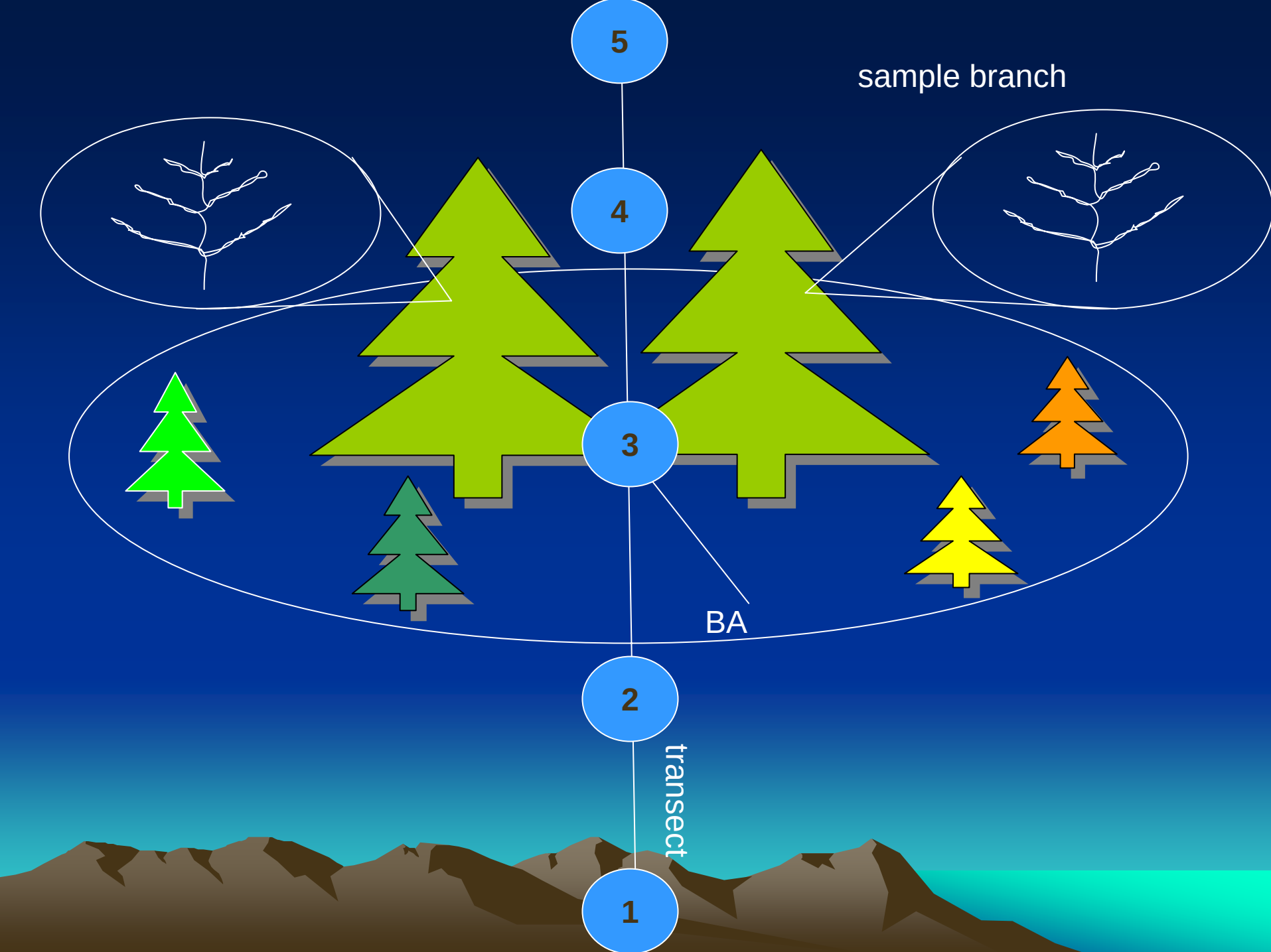
Gregory Filip
USDA Forest Service
Portland, OR
gmfilip@fs.fed.us

Swiss needle cast project location

Project Objectives

In 59 stands, determine 5-year changes in:

- Tree diameter and height growth
- SNC severity as estimated by needle retention and pseudothecial counts


5
sample branch
4
3
BA
2
transect
1

Project Methods

Data collected in 2001 and 2006:

- Slope, aspect, elev., treatments
- Dbh and total height
- Height to lowest live branch
- Needle retention, 2 methods
- Pseudothecial counts (2002 and 2006)

Additional data collected in 2006:

- Sapwood area
- Tree age
- Stand density as basal area/ha

Two Measures of Foliage Loss

- **Foliage-retention index** – amount of foliage remaining in each needle age-class (4 yrs):

  0 =0-10%, 1=11-20%...9=90-100%

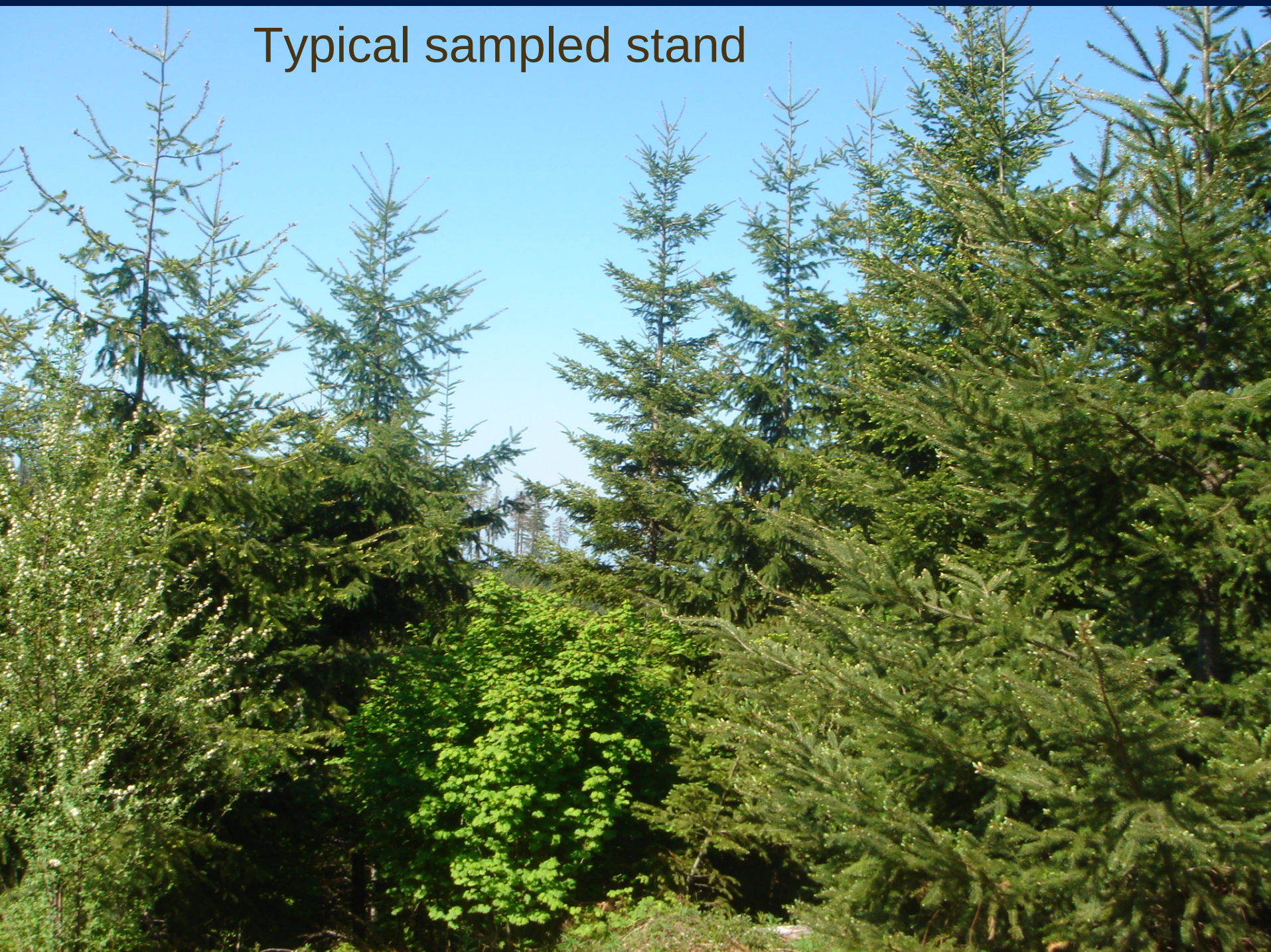
  Score range = 0 to 36

  3 trees per stand – cut branches
- **Ocular estimation of foliage retention in the mid-crown:**

  Score range = 0 to 6 years

  10 (all) trees per stand

Typical sampled stand



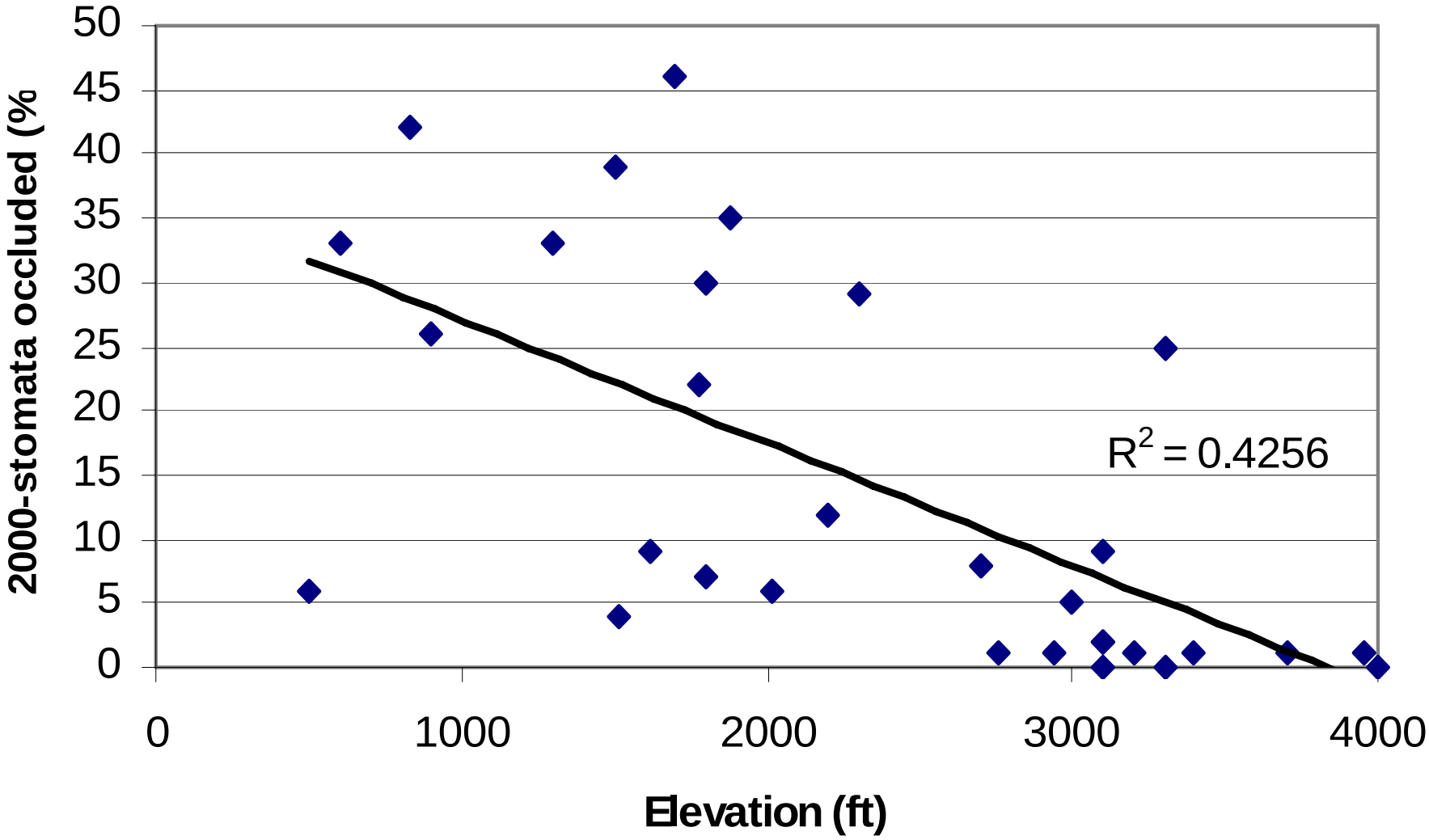
Results from 2001-2006

- Sampled 590 Douglas-firs in 59 stands
- Mean 5-yr dbh growth = 2.4 in.
- Mean 5-yr total-height growth = 11.9 ft.
- Mean foliage-retention index (0-36) increased by 3.4
- Mid-crown retention increased by 1.2 yrs
- Mean stomata occlusion = 13.6% in 2002 and 13.3% in 2006 for 2-yr-old needles

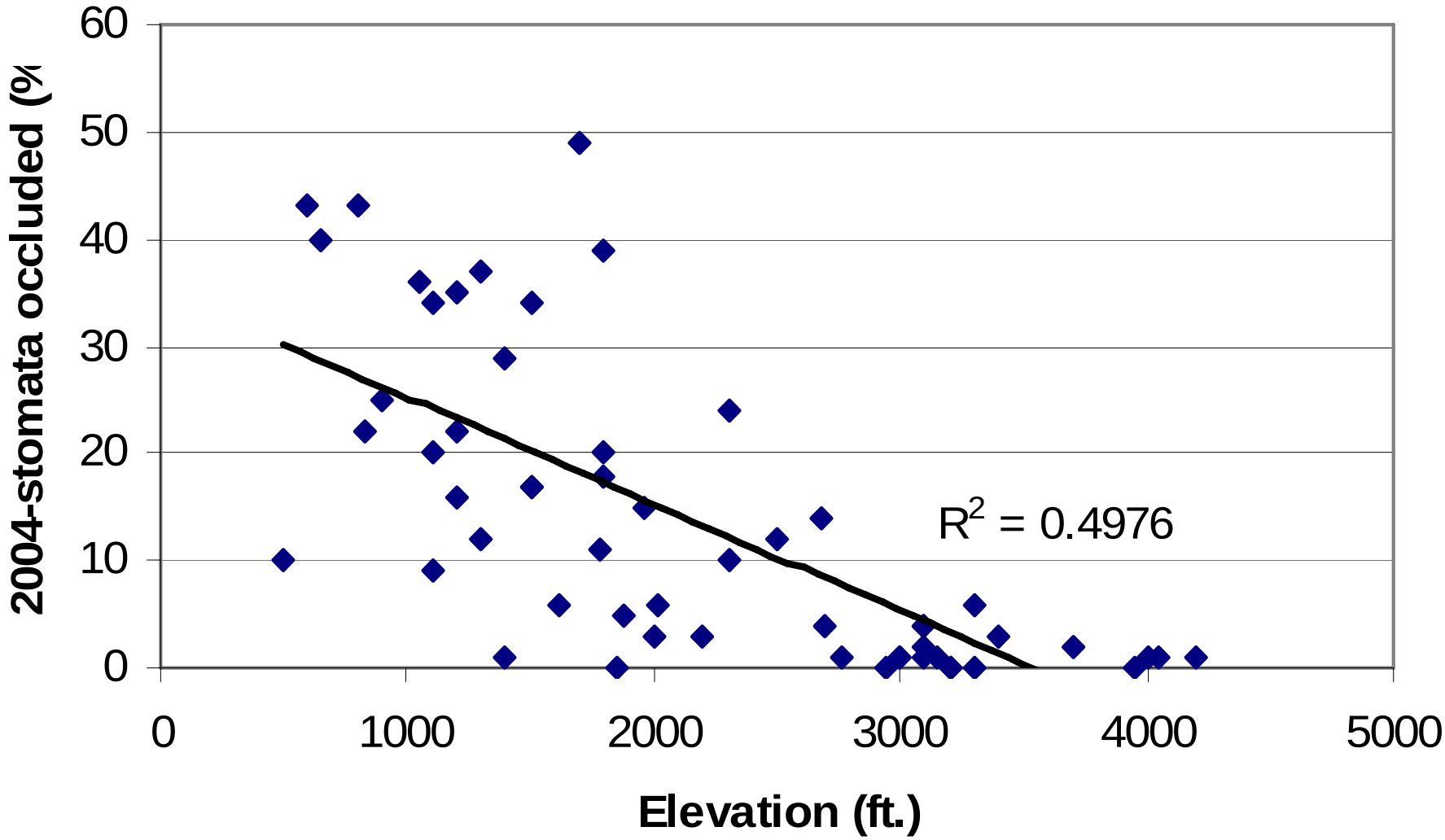
Correlation among variables

- Poor correlations (R^2<0.3) among most variables
- Exceptions were moderate correlations between **stand elevation** and 2000-stomata occluded (R^2=0.43) or 2004-stomata occluded (R^2=0.50)
- Fewer pseudothecia at higher elevations
- All pseudothecia in 2002 were lineage 1

2000 stomata occluded vs. elevation



2004 stomata occluded vs. elevation



Conclusions

There are at least three possible reasons why there may be no appreciable affect of SNC on 5-yr Douglas-fir growth in the Cascades vs. the Coast:

- Differences in site characteristics
- Differences in fungal genetics
- Not enough time

Cascade forest-management recommendations

- Forest managers may need not alter their current practices because of Swiss needle cast.
- Managing a mix of Douglas-fir and hemlock at the lower elevations and Douglas-fir and noble fir at the higher elevations will help offset any future stand-growth declines due to SNC or other pest outbreaks.

We will continue to monitor the established plots to determine long-term SNC trends and effects.

- Dbh and total-height growth in 2011
- Changing fungal populations
- Washington State Cascades???

Swiss Needle Cast Aerial Survey 1996-2010 All years, cumulative