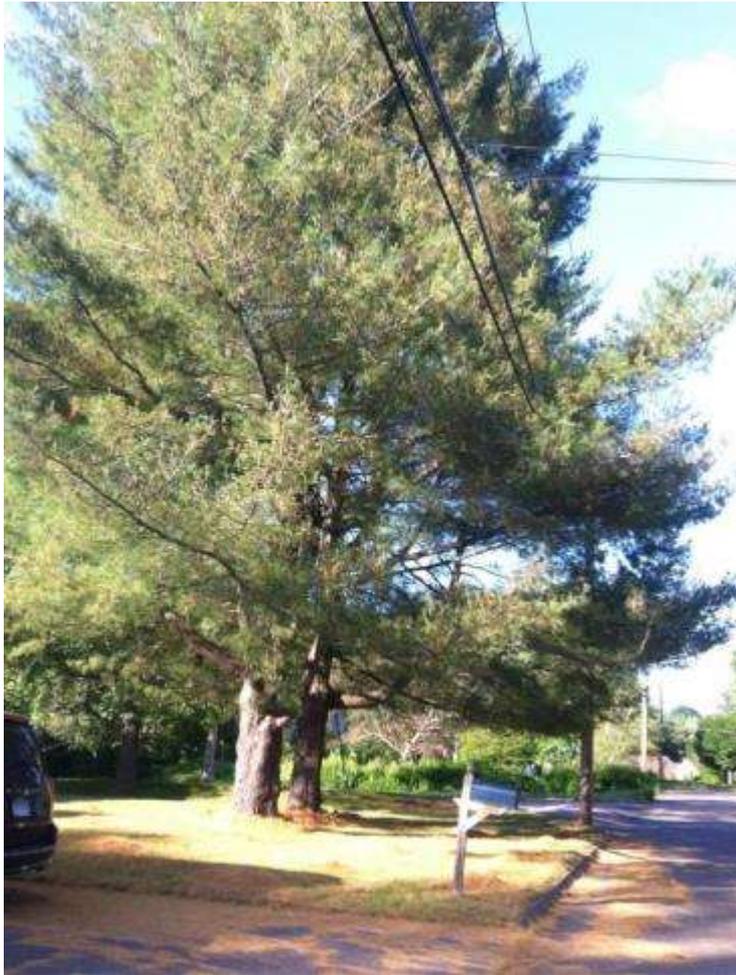


# What's Happening to Eastern White Pine in the Northeast?



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# Yellowing and Browning of Needles



14 June 2014



14 March 2013

# Yellowing and Browning of Needles (cont.)



Courtesy of Michael Manware

# Yellowing and Browning of Needles (cont.)



Courtesy of Jameson Secco



Courtesy of Eric Hansen

# Seasonal Needle Drop

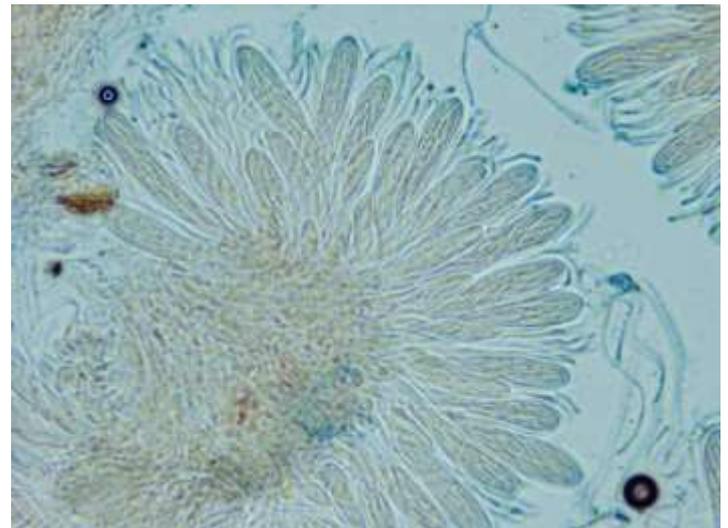


# Salt Spray Damages



14 March 2013

# Dooks Needle Cast



*Lophophacidium dooksii*  
(formerly *Canavirgella banfieldii*)

# Bifusella Needle Cast



*Bifusella linearis*



# Mycosphaerella Brown Spot Needle Blight

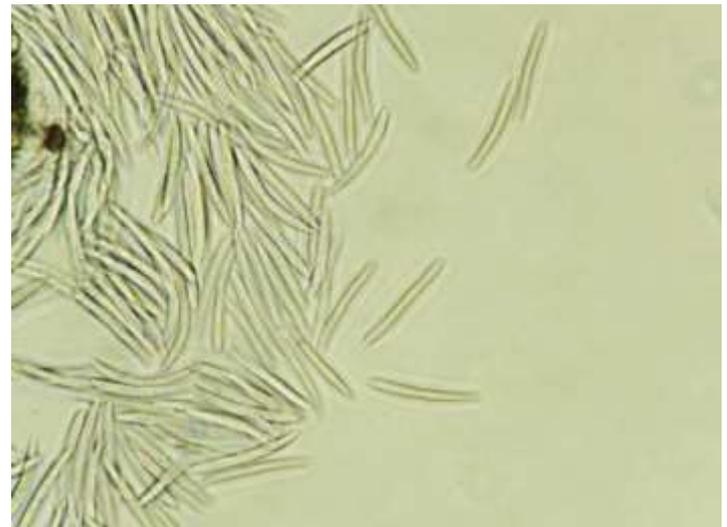


*Lecanosticta acicola*  
(formerly *Mycosphaerella dearnessii*)

# Septorioides Needle Blight



*Septorioides strobis*



Article

# Characterization of Fungal Pathogens Associated with White Pine Needle Damage (WPND) in Northeastern North America

Kirk Broders <sup>1,\*</sup>, Isabel Munck <sup>2</sup>, Stephen Wyka <sup>1</sup>, Gloria Iriarte <sup>1</sup> and Eric Beaudoin <sup>1</sup>



- In 2011, sampled from ME, NH, VT, and MA
- 22 species of fungi were identified
- 4 major species were:
  - *Lophophacidium dooksii*  
(*Canavirgella banfieldii*)
  - *Bifusella linearis*
  - *Lecanosticta acicola*  
(*Mycosphaerella dearnessii*)
  - *Septorioides* spp.

## Emergence of white pine needle damage in the northeastern United States is associated with changes in pathogen pressure in response to climate change

STEPHEN A. WYKA<sup>1</sup>, CHERYL SMITH<sup>1</sup>, ISABEL A. MUNCK<sup>2</sup>, BARRETT N. ROCK<sup>3</sup>,  
BETH L. ZINITI<sup>4</sup> and KIRK BRODERS<sup>1,5</sup>

- Investigated the distribution of the four fungal pathogens and associated weather condition in the Northeast
  - From 2011 to 2014
  - 210 trees
  - 70 locations
  - 6 states (ME, NH, VT, MA, NY, RI)

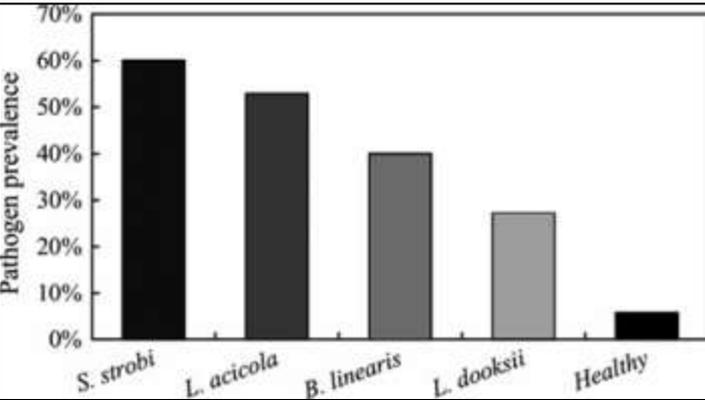
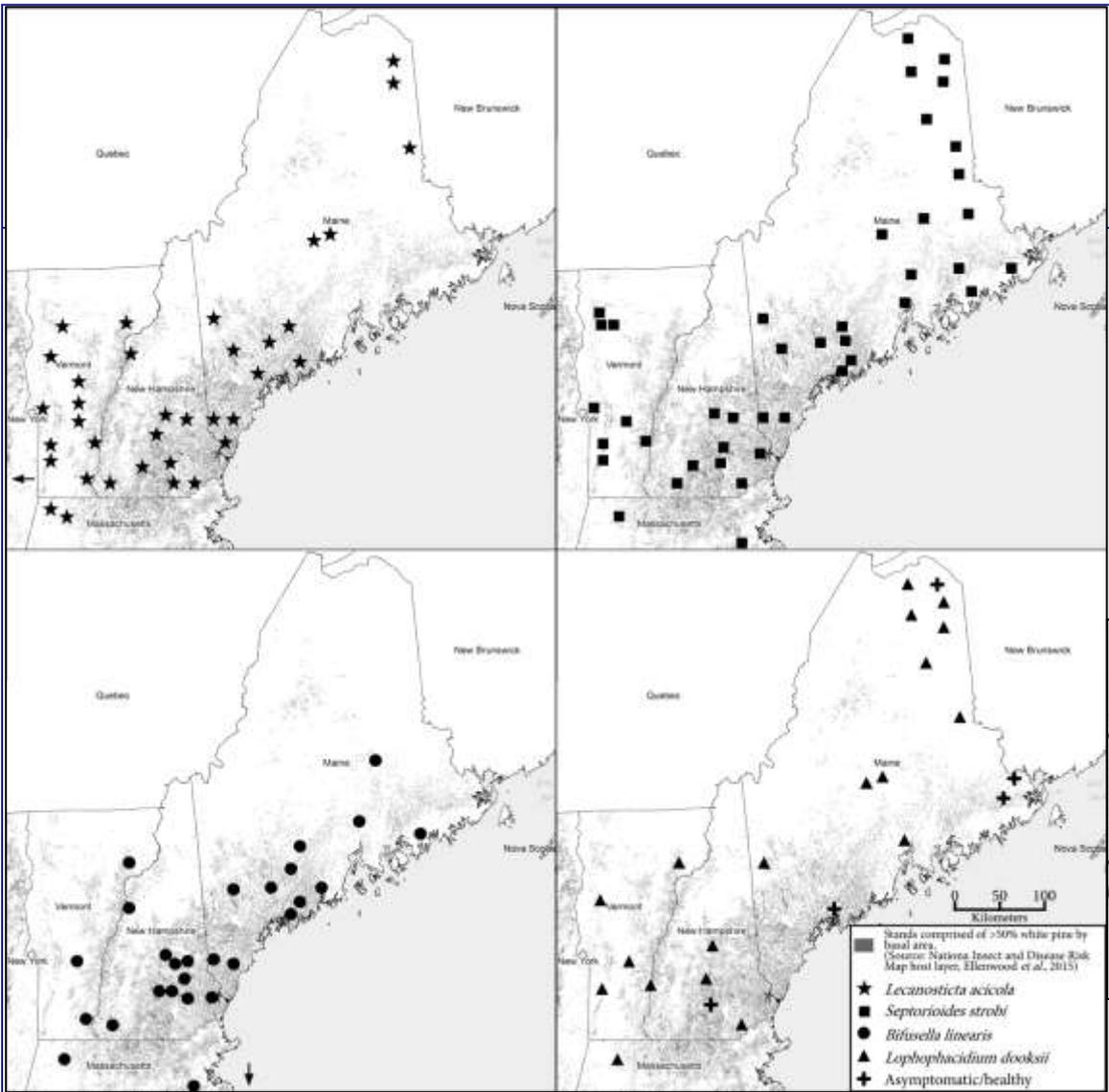


Fig. 3 Pathogen prevalence of *Septorioides strobi*, *Lecanosticta acicola*, *Bifusella linearis*, *Lophophacidium dooksii*, and healthy sites as percent of total of 70 sampled locations.

# WPND is a disease complex

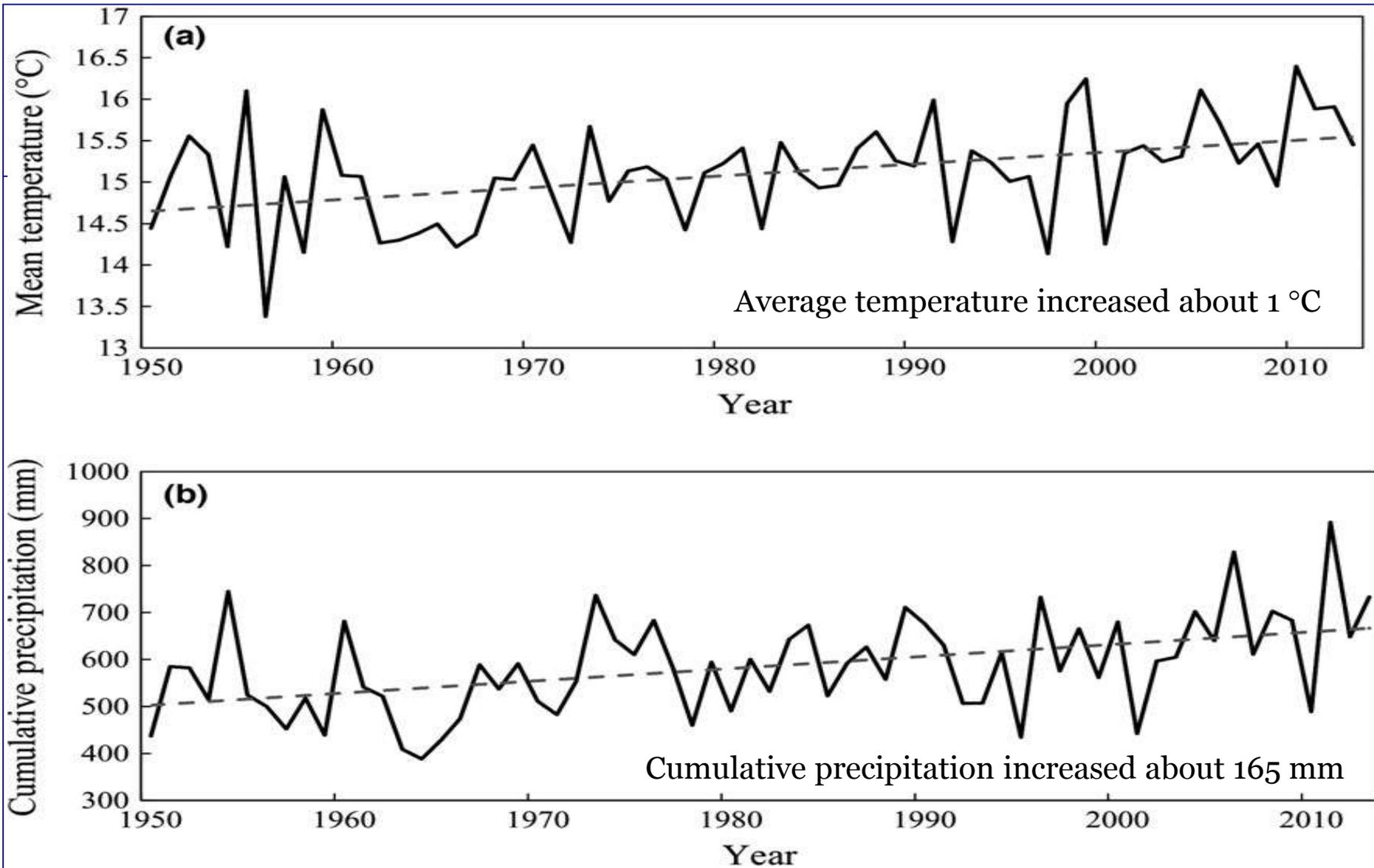


Fig. 4 Northeastern regional mean temperature (a) and cumulative precipitation (b) during eastern white pine growing season (April–September)

## Dramatic needle browning and canopy dieback of eastern white pine (*Pinus strobus*) in southern New England

Nicholas J. Brazee, Ph.D.  
Extension Plant Pathologist

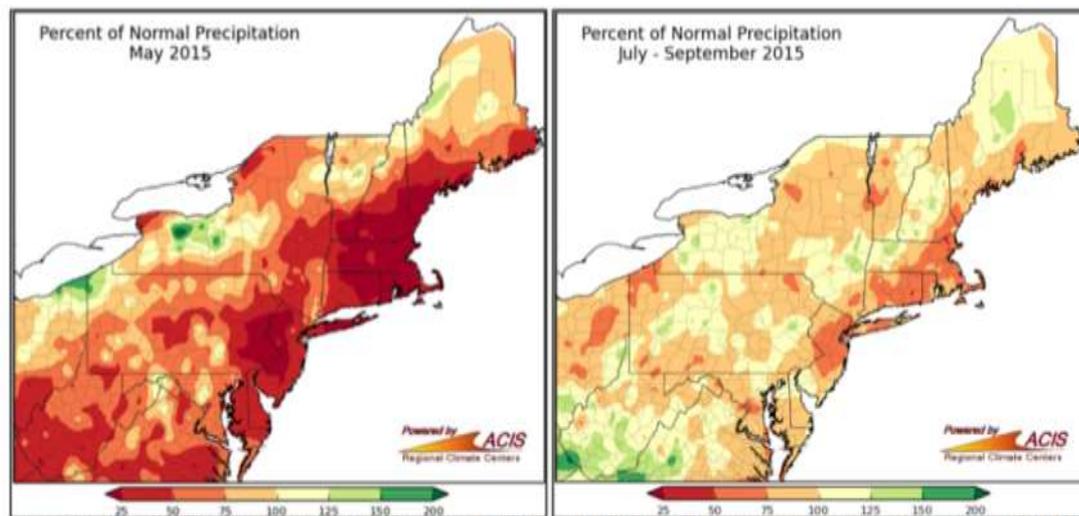


FIGURE 3. BELOW-AVERAGE PRECIPITATION DURING MAY (LEFT) AND FROM JULY THROUGH SEPTEMBER (RIGHT) IN 2015.

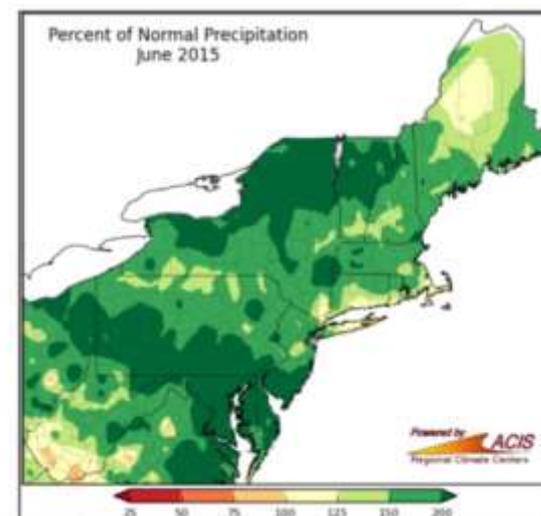


FIGURE 4. ABOVE-AVERAGE PRECIPITATION DURING JUNE OF 2015.

## **Dramatic needle browning and canopy dieback of eastern white pine (*Pinus strobus*) in southern New England**

Nicholas J. Brazee, Ph.D.  
Extension Plant Pathologist

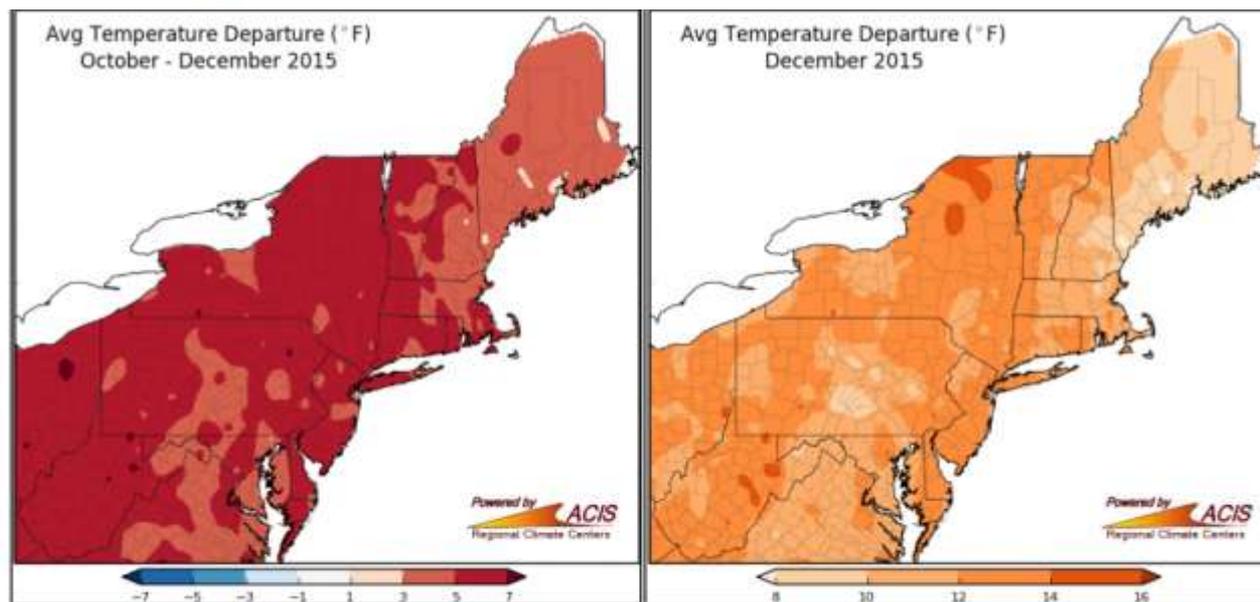


FIGURE 7: ABOVE-AVERAGE TEMPERATURES FROM OCTOBER THROUGH DECEMBER (LEFT) THAT WERE PARTICULARLY PRONOUNCED IN THE MONTH OF DECEMBER ALONE (RIGHT).

# Caliciopsis Canker



- *Caliciopsis pinea*
  - First recorded in Vermont in 1882
  - Distributed in Eastern North America and Europe
- Damages on white pine
  - Kill young trees
  - Declining
  - Degrade wood quality



Munck et al. 2015. Forests 6:4360-4373



# NEWS RELEASE

USDA Forest Service, Northeastern Area  
State and Private Forestry  
271 Mast Rd, Durham NH 03824



Phone: 603-868-7600; Fax: 603-868-7604; Web Site: <http://www.na.fs.fed.us/>

Date: June 20, 2012

Release No. DFO-08-12

Contact: [Glenn Rosenholm](#)

phone (603) 868-7686

E-mail: [grosenholm@fs.fed.us](mailto:grosenholm@fs.fed.us)

## Pine canker a growing concern in the East

A native canker is posing a growing problem for pines across New Hampshire and several other eastern states.

The Caliciopsis canker, or *Caliciopsis pinea*, is damaging pine trees in Grafton, Hollis and elsewhere across New Hampshire. The disease affects approximately 1,000 acres of eastern white pine in the Hollis area alone.

Article

## **Extent and Severity of Caliciopsis Canker in New England, USA: An Emerging Disease of Eastern White Pine (*Pinus strobus* L.)**

Isabel A. Munck <sup>1,\*</sup>, William Livingston <sup>2</sup>, Kyle Lombard <sup>3</sup>, Thomas Luther <sup>1</sup>, William D. Ostrofsky <sup>4</sup>, Jennifer Weimer <sup>3</sup>, Stephen Wyka <sup>5</sup> and Kirk Broders <sup>5</sup>

- 58 sites surveyed in ME, NH, and MA during 2014
- Caliciopsis canker was found in 42 (72%) sites
- Higher disease severity in the areas with
  - Excessively drained, nutrient poor soils
  - Higher tree density (311 trees/ha compared to 220 trees/ha)



# FOREST HEALTH REVIEW

May 2011

## WHAT'S KILLING WHITE PINE IN THE HIGHLANDS OF WESTERN VIRGINIA?



Dead branches on these white pines in Bath County indicate these trees will be completely dead within a couple of years.



Black fruiting structures (perithecia) of the fungus *Caliciopsis pinea* emerge from a stem canker on white pine.



Black scale insects (*Matsucoccus* sp.) found embedded within stem canker tissue on white pine.



# FOREST HEALTH REVIEW

February 2016

## WHITE PINE SCALE/PATHOGEN COMPLEX

1. Caliciopsis canker  
(*Caliciopsis pinea*)
2. Canadian pine scale  
(*Matsucoccus macrocitrices*)



White pines in decline along Route 250 in Augusta County, VA.



White pine mortality in Highland County, VA.



# FOREST HEALTH REVIEW

May 2011

## WHAT'S KILLING WHITE PINE IN THE HIGHLANDS OF WESTERN VIRGINIA?

1. *Fusarium chlamydosporium*
2. *Fusarium acuminatum*
3. *Diplodia scrobiculata*  
(also known as *Diplodea pinea*, or  
*Sphaeropsis sapinea*)



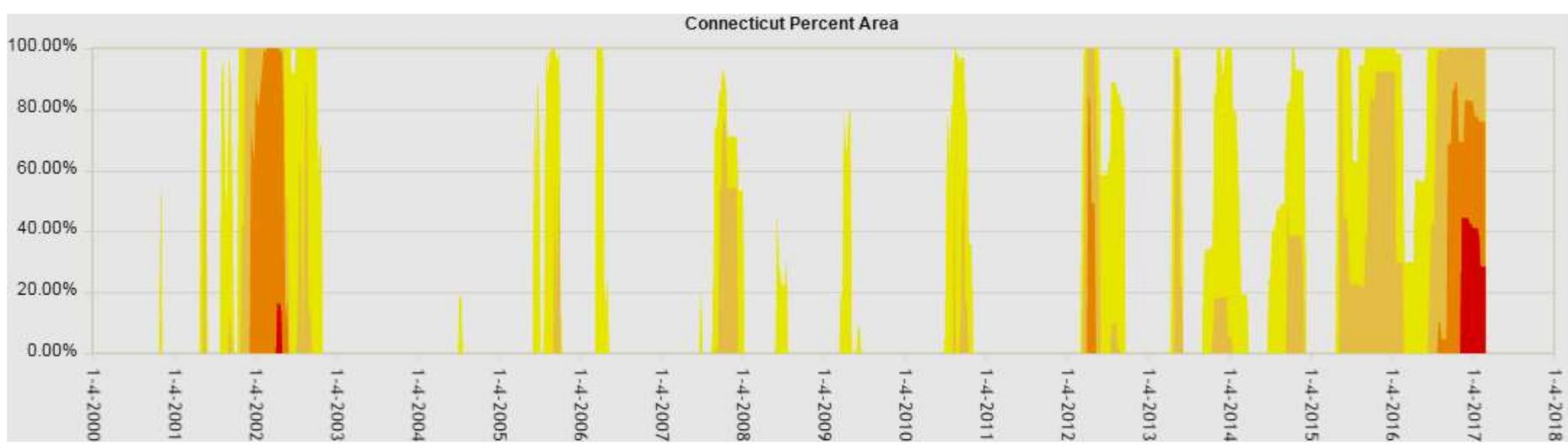
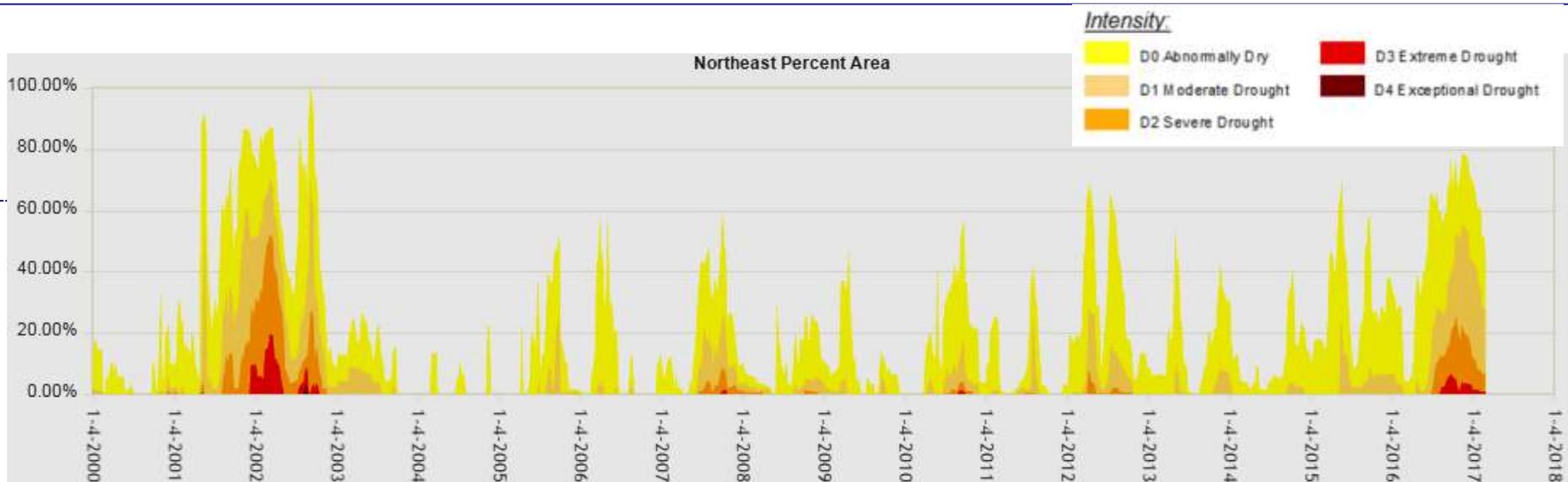
Dead white pine saplings in Bath County  
are due to unknown causes.

# Fungal Canker?



Courtesy of Eric Hansen





1/1/2000-2/28/2017

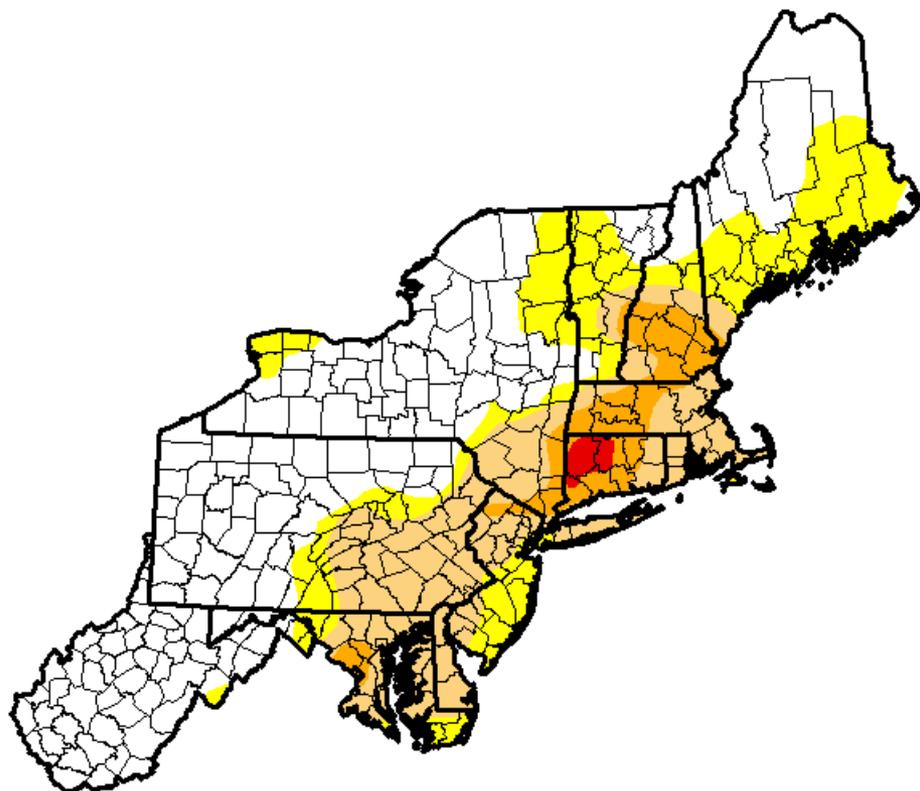
<http://droughtmonitor.unl.edu/Home.aspx>

# U.S. Drought Monitor Northeast

**February 28, 2017**  
(Released Thursday, Mar. 2, 2017)  
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
<b>Current</b>	53.17	46.83	27.08	6.96	0.70	0.00
<b>Last Week</b> <i>2/21/2017</i>	48.49	51.51	28.01	6.53	0.70	0.00
<b>3 Months Ago</b> <i>11/29/2016</i>	22.14	77.86	54.36	19.69	3.40	0.00
<b>Start of Calendar Year</b> <i>1/3/2017</i>	30.54	69.46	43.67	11.68	1.39	0.00
<b>Start of Water Year</b> <i>9/27/2016</i>	21.72	78.28	40.32	19.59	6.68	0.00
<b>One Year Ago</b> <i>3/1/2016</i>	96.26	3.74	0.00	0.00	0.00	0.00



**Intensity:**

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

**Author:**  
Richard Heim  
NCEI/NOAA



<http://droughtmonitor.unl.edu/>