# FOREST HEALTH

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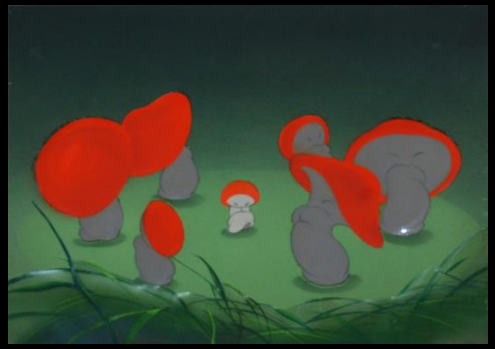
**Chelsea Kyler**, Senior, Forest Biology, Penn State University

Camp Susque, September 28, 2013



# OUTLINE

Forest Health defined

Forest pests

Forest pathogens

Abiotic stresses

Mortality spiral

Chelsea EAB and research!

# FOREST HEALTH

# WHAT IS A HEALTHY FOREST?

What are your landowner objectives?

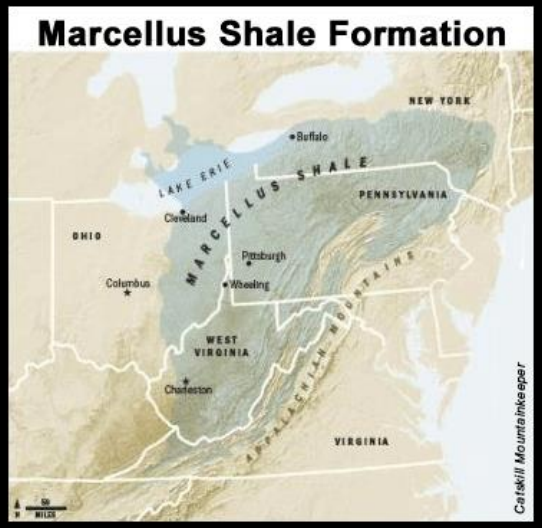
What do you ENVISION to be a healthy forest?

What is acceptable to you?

What is best for the ecosystem?

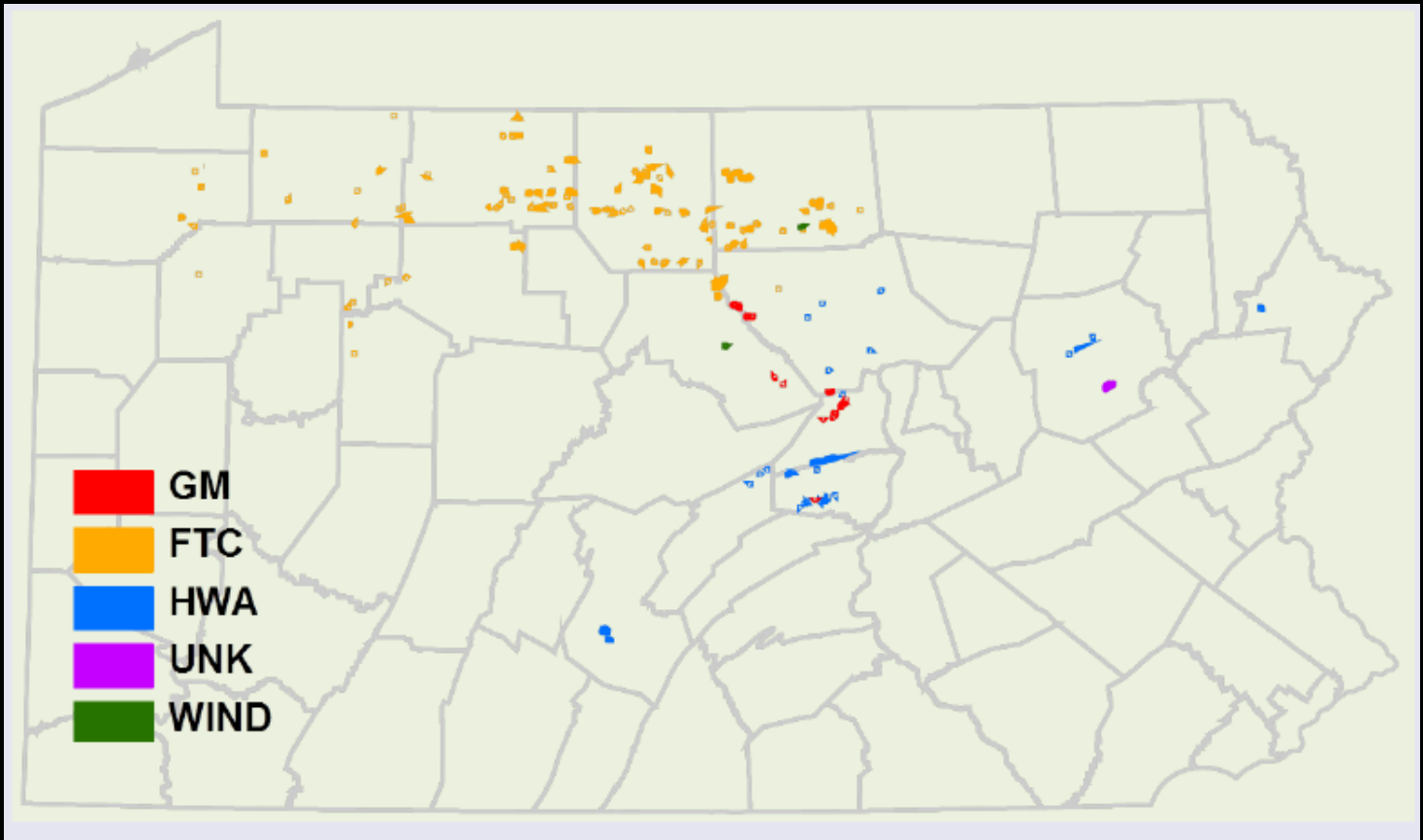
What is healthy to YOU may not be to ME!

# LAND "SICKNESS"





# 2012 TREE MORTALITY IN PA



# FOREST PESTS

Gypsy moth

Tent caterpillars

Hemlock woolly adelgid &

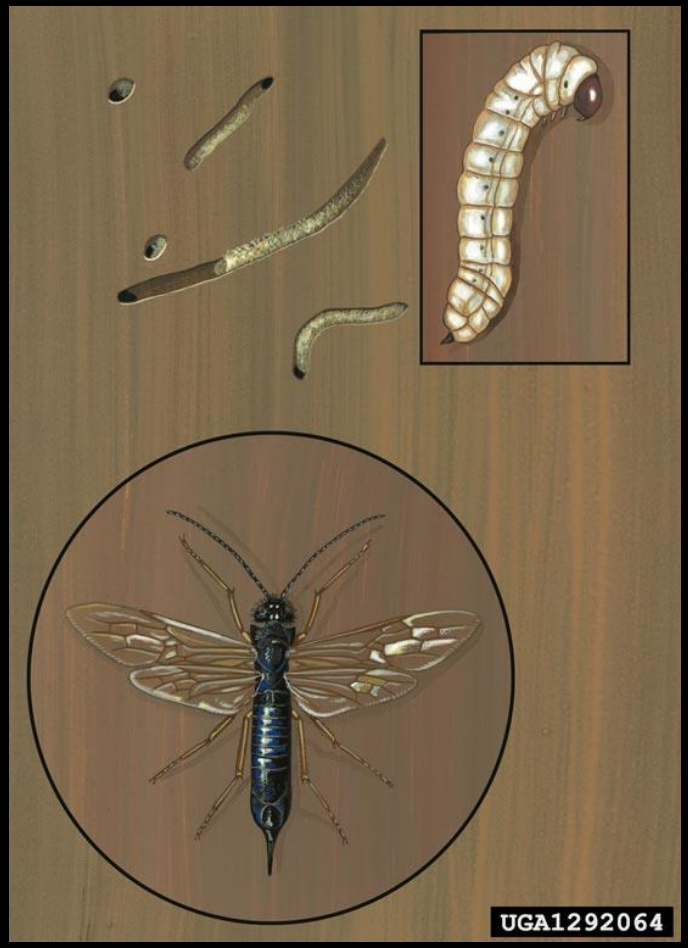
elongate hemlock scale

Asian longhorned beetle (ALB)

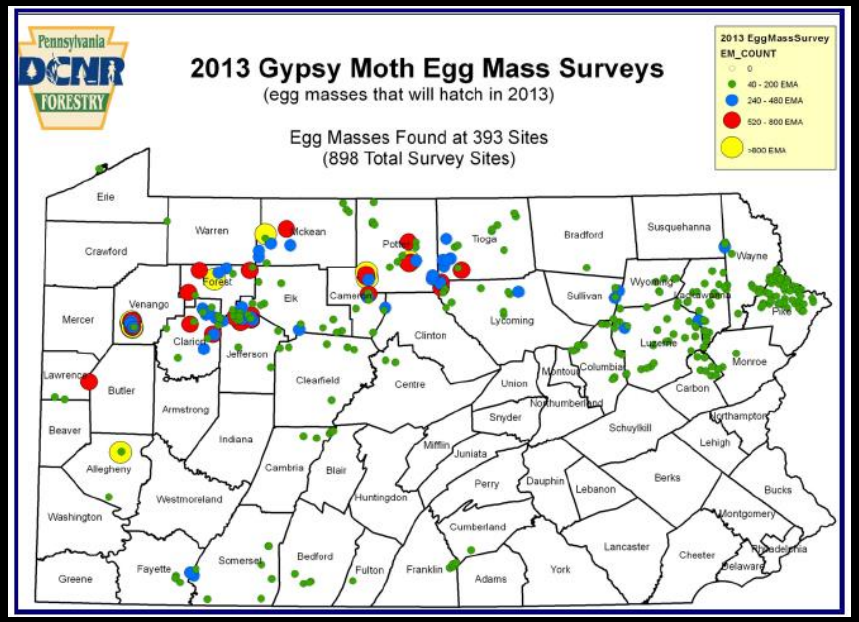
Emerald ash borer (EAB)

And SO many more…

INSECTS & BUGS



# GYPSY MOTH


Pennsylvania
DCNR
FORESTRY
2013 Gypsy Moth Egg Mass Surveys
(egg masses that will hatch in 2013)
Egg Masses Found at 393 Sites
(898 Total Survey Sites)
2013 EggMassSurvey
EM_COUNT
0
40 - 200 EMA
240 - 480 EMA
520 - 800 EMA
>800 EMA
Erie
Warren
Mckean
Potter
Tioga
Bradford
Susquehanna
Wayne
Crawford
Forest
Elk
Cameron
Sullivan
Wyoming
Lackawanna
Pike
Mercer
Venango
Clarion
Jefferson
Clinton
Lycoming
Luzerne
Monroe
Lawrence
Butler
Clearfield
Centre
Union
Montour
Columbia
Carbon
Northumberland
Armstrong
Snyder
Northampton
Beaver
Indiana
Schuylkill
Lehigh
Mifflin
Juniata
Allegheny
Cambria
Blair
Perry
Dauphin
Lebanon
Berks
Bucks
Westmoreland
Huntingdon
Washington
Cumberland
Montgomery
Lancaster
Cheester
Philadelphia
Greene
Fayette
Somerset
Bedford
Fulton
Franklin
Adams
York
Delaware


UGA0000004b

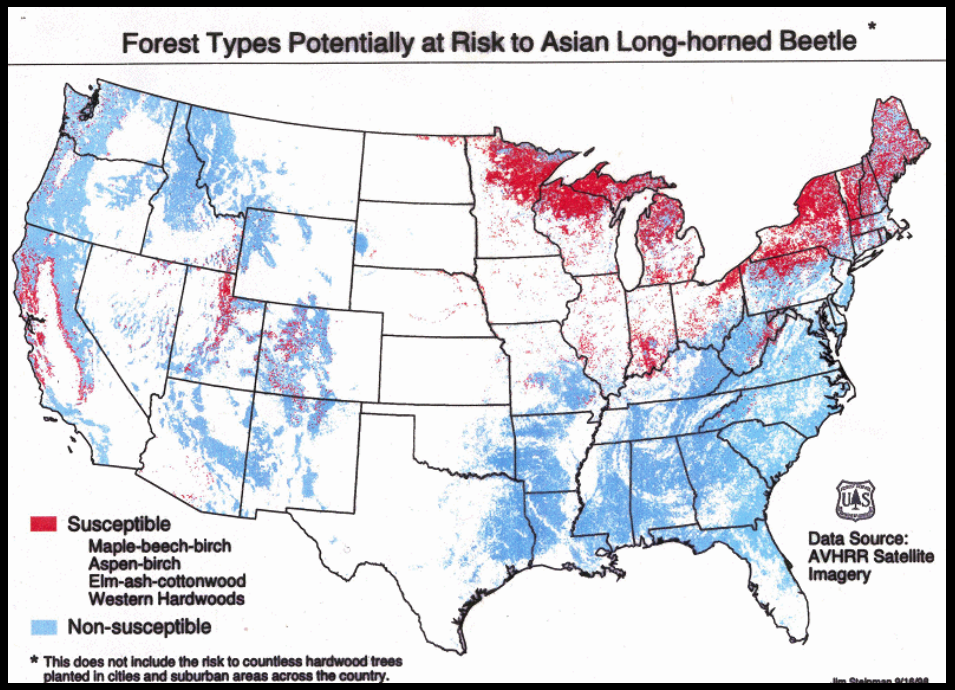
# TENT CATERPILLARS



# HWA & EHS

# ALB


UGA0949056


Forest Types Potentially at Risk to Asian Long-horned Beetle *
Susceptible
Maple-beech-birch
Aspen-birch
Elm-ash-cottonwood
Western Hardwoods
Non-susceptible
Data Source:
AVHRR Satellite
Imagery
* This does not include the risk to countless hardwood trees planted in cities and suburban areas across the country.

# FOREST PATHOGENS

Beech bark disease

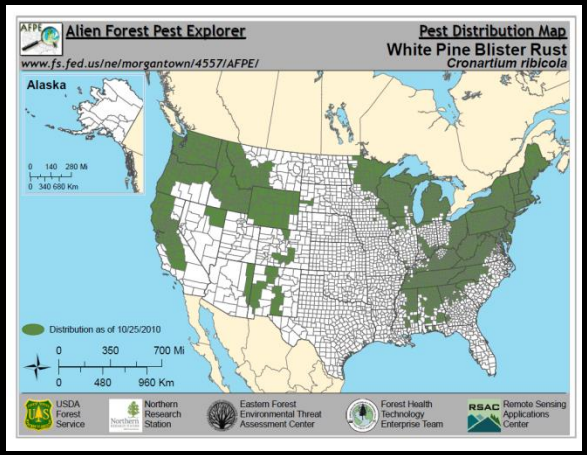
Chestnut blight

Dutch elm disease and elm yellows

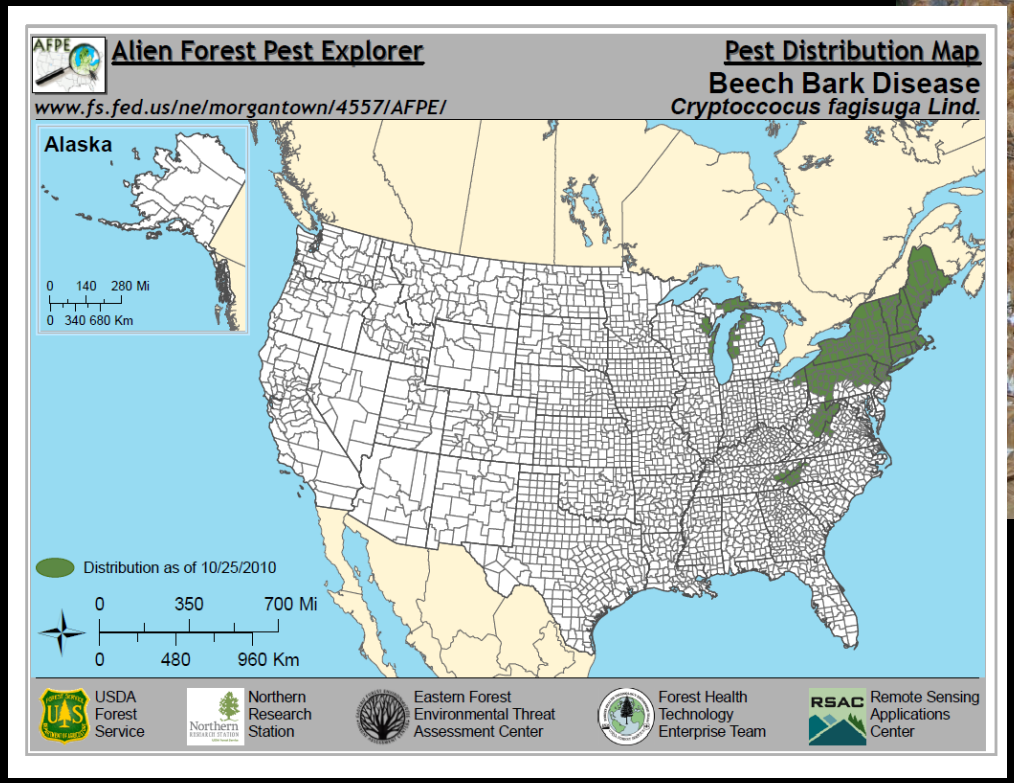
Armillaria root rot

Thousand cankers disease

And SO many more…

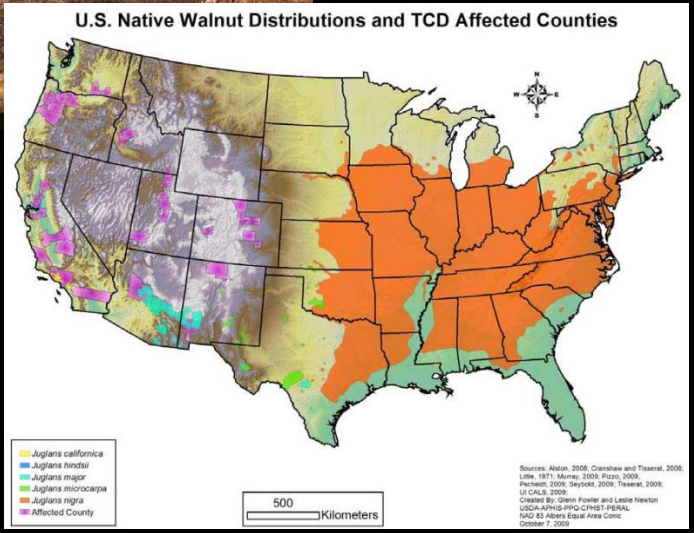


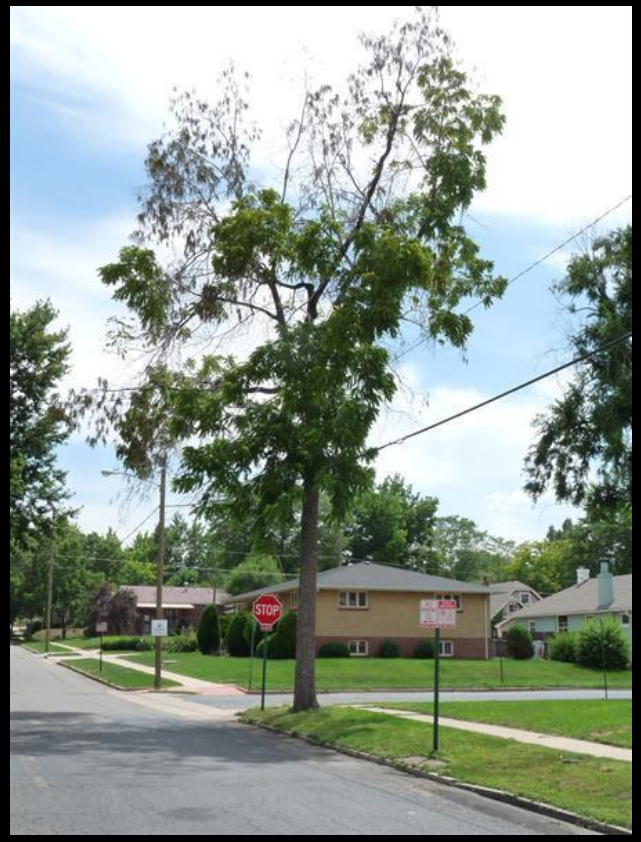
# BEECH BARK DISEASE
# (BEECH SCALE – NECTRIA CANKER)

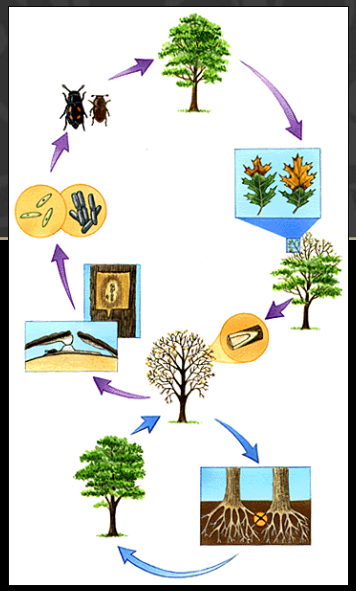




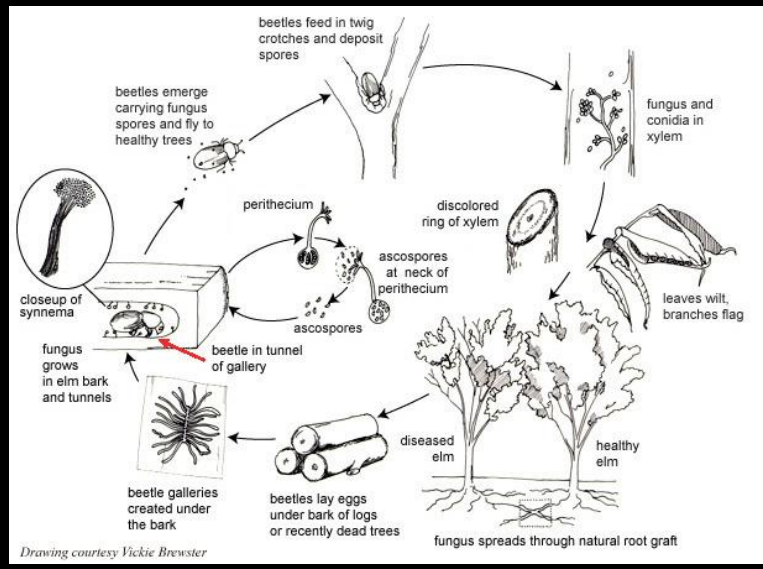
# THOUSAND CANKERS DISEASE

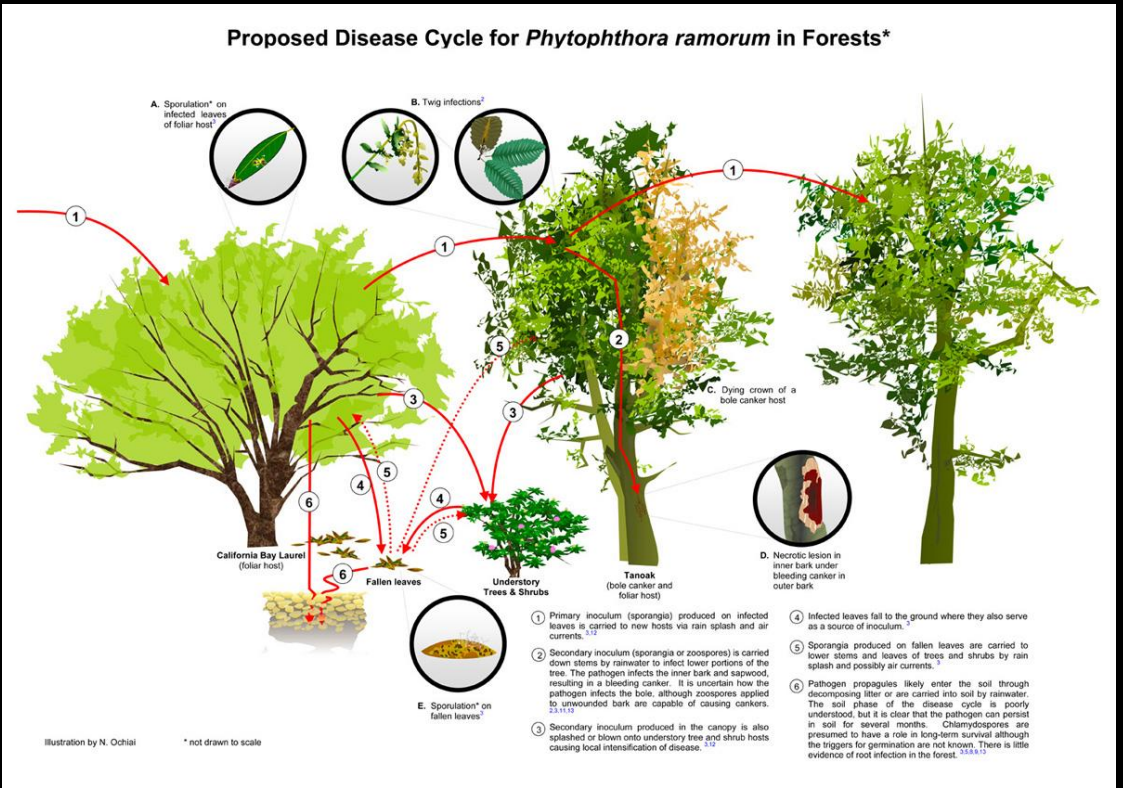




# FOREST PATHOGENS

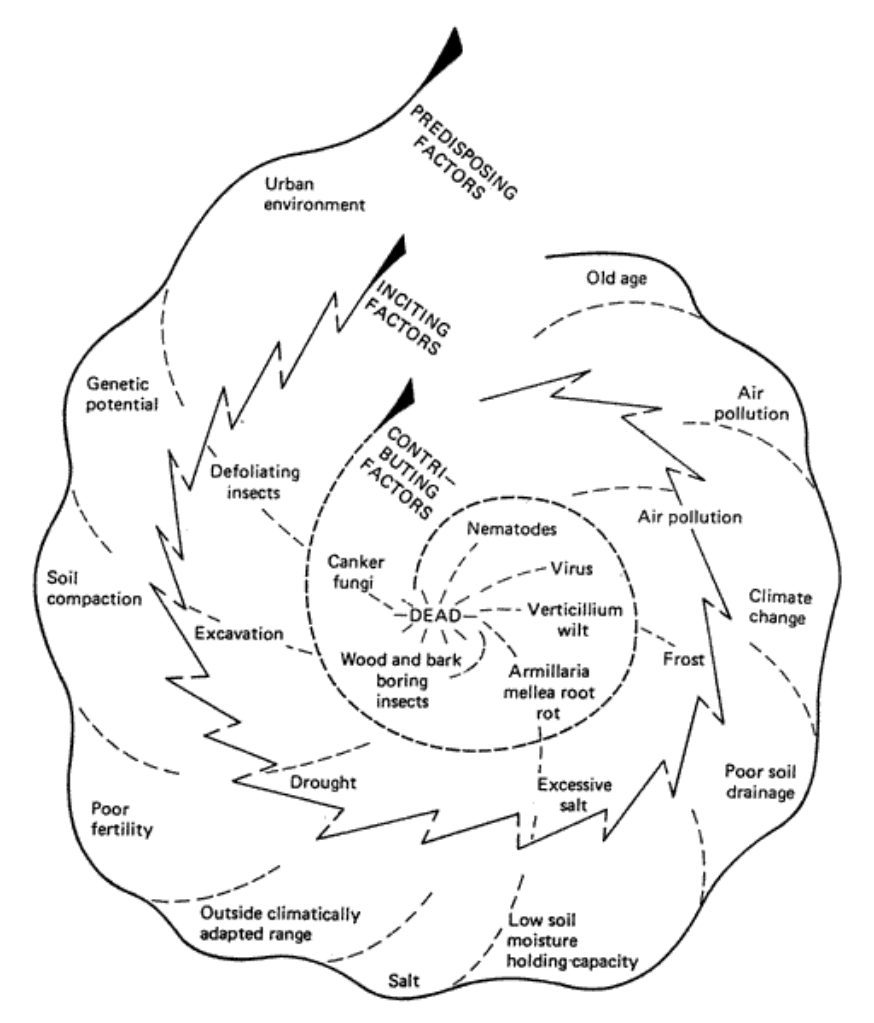



Armillaria Root Rot Fungus

# ABIOTIC STRESSORS


# MORTALITY SPIRAL




## QUESTIONS?

It is now time for…

# EAB AND CHELSEA KYLER !