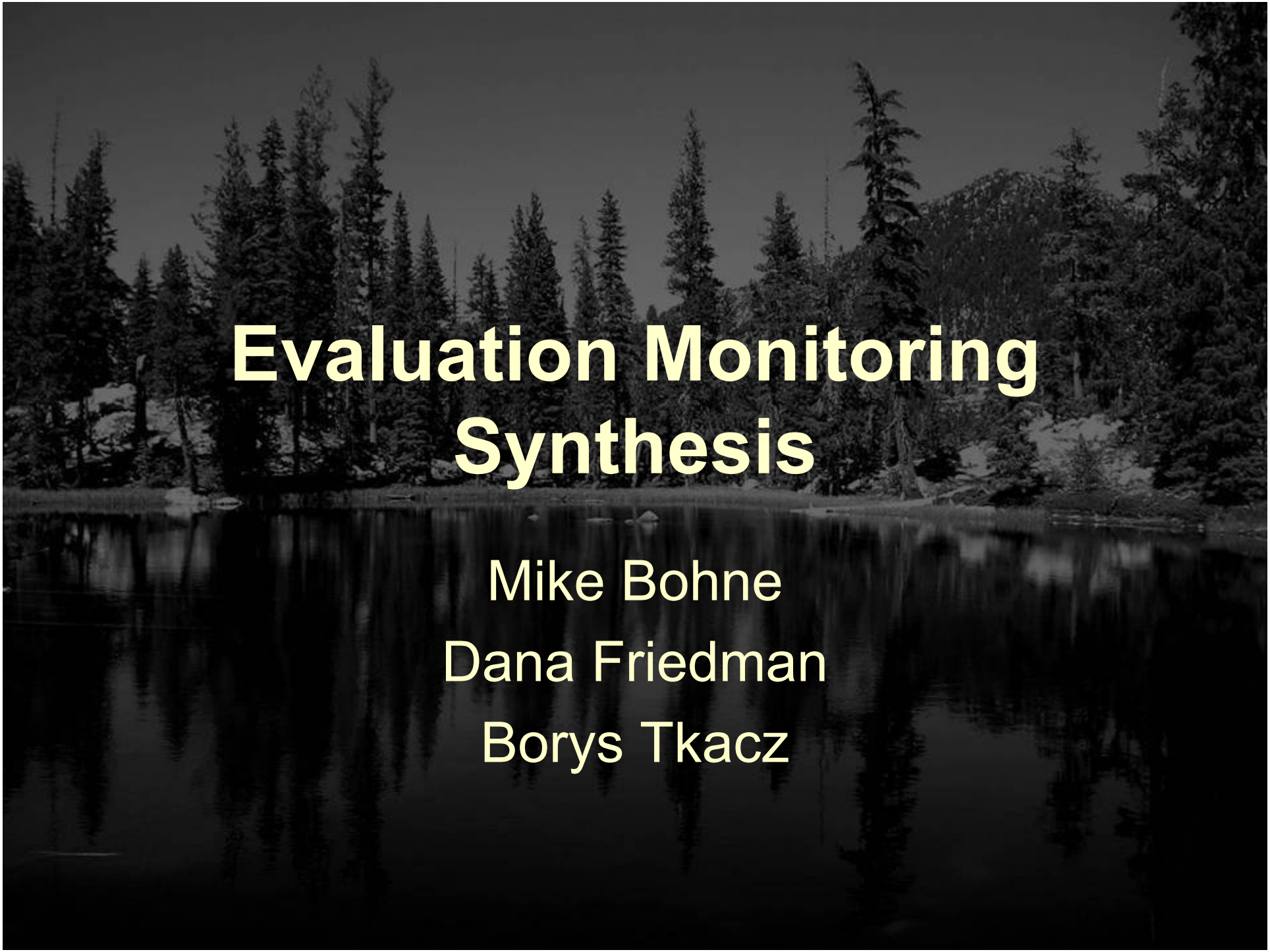


Evaluation Monitoring Synthesis

Mike Bohne

Dana Friedman

Borys Tkacz

Evaluation Monitoring

- Evaluation Monitoring - projects to determine extent, severity, and causes of undesirable changes in forest health identified through Detection Monitoring

- Request for Proposals:
  - **Base EM Projects**
  - **Fire Plan EM Projects**

Evaluation Monitoring Synthesis

- Objectives
  - Provide an accurate list of completed EM projects
  - Provide an annotated bibliography of results
  - To synthesize the results by issue/pest
  - Determine what the results mean in terms of changes to components of the FHM program
  - Determine how the EM results have been used and how effective our technology transfer efforts have been

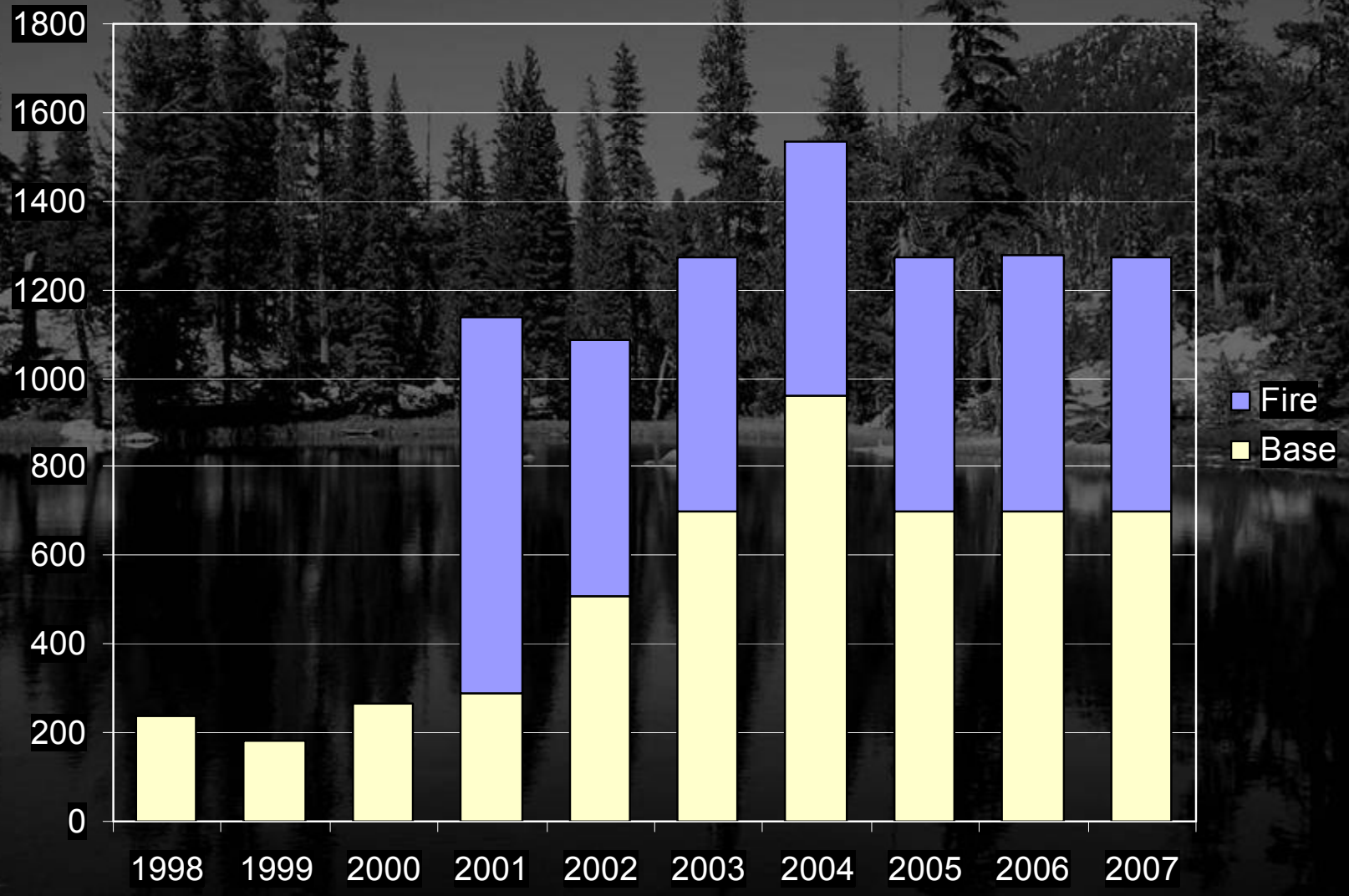
Evaluation Monitoring Synthesis

- Methods
  - Create master bibliography
  - Compile project abstracts
  - Standardize list of projects/add keywords
  - Assess projects for funding trends
  - Identify content specialists
  - Coordinate chapter summaries
  - Produce final report

EM Summary

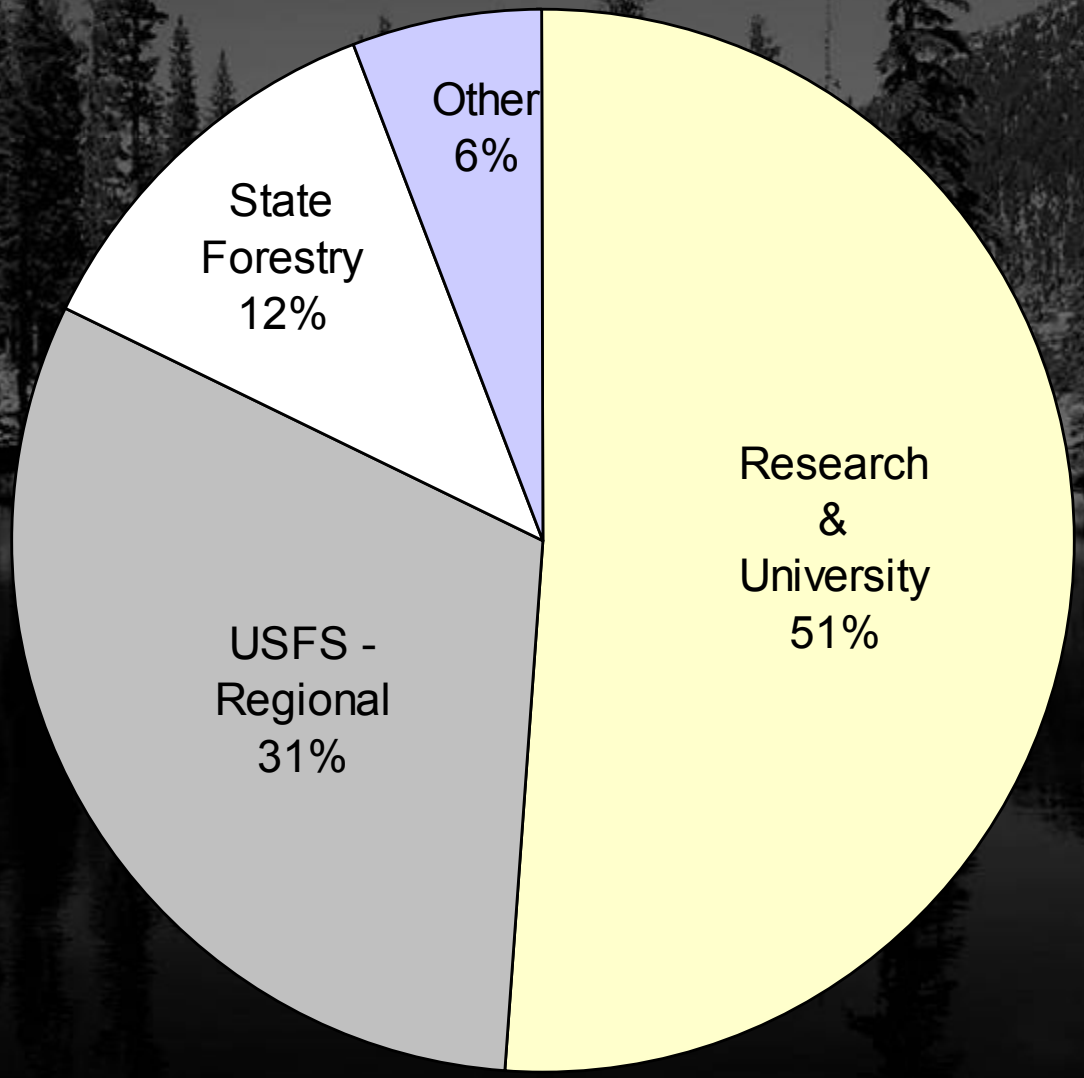
- Prolific
- 80 refereed reports, over 200 non-refereed reports, and more than 300 posters presented
- Approximately 50% of projects by University and/or USFS Research, 30% projects were performed by FHP or NFS, and almost 20% are State or other.

Funding History



*Includes regional funds

EM Funding by Recipient



Master Bibliography

Journal Articles:

Asbjornsen, H.; Brudvig, L.A.; McMullen-Mabry, C.; Evans, C.W.; Karnitz, H.M. In press. Defining appropriate reference conditions for restoring ecologically rare oak savanna ecosystems in the Midwest, USA. Journal of Forestry. 103(7) (in press)

Alexander, S.A.; Palmer, C.J. 1999. Forest Health Monitoring in the United States: First four years. Environmental Monitoring and Assessment. 55(2): 267-277.

Ambourn, A.; Juzwik, J. 2005. Relative importance of the small oak bark beetle, in the overland transmission of *Ceratocystis fagacearum* in Minnesota. Phytopathology 95:S161.

Ambourn, A.; Juzwik, J.; Moon, R.D. 2005. Seasonal dispersal of the oak wilt fungus by *Colopterus truncatus* and *Carpophilus sayi* in Minnesota. Plant Dis. 89:1067-1076.

Ambourn, A.; Juzwik, J.; Moon, R.D. 2005. Use of force of infection to determine relative importance of two sap beetles species in the overland transmission of *Ceratocystis fagacearum*. Phytopathology 95:S161.

Applegate, J.R.; Steinman, J. 2005. A comparison of tree health among forest types and conditions at Fort A.P. Hill, Virginia. Southern Journal of Applied Forestry. 29(3): 143-147.

Auclair, A.N.D. 2005. Patterns and general characteristics of severe forest dieback in Northeastern United States. Canadian Journal of Forest Research. 35: 1342-1355

Searchable Database

1	Project Title	Principle Investigato	Poster Link	Paper
2	Lake State Basswood Decline Evaluation	Kenneth Raffa	http://fhm.fs.fed.us/posters/posters01/basswood.pdf	Werner, S.M., Nor Impacts of the intr
3	Forest Decline after Partial Harvest in Forest Stands in New Hampshire	Jen Bofinger	http://fhm.fs.fed.us/posters/posters01/eval.pdf	
4	Estimating Seasonal Exposures & Concentrations of Ozone for the Great Lakes Region	Teague Prichard	http://fhm.fs.fed.us/posters/posters01/ozone.pdf	
5	OR/WA Swiss Needle Cast Survey	Alan Kanaskie	http://fhm.fs.fed.us/posters/posters01/swissor.pdf	Hansen, E. M., St P., Sutton, W., W McWilliams, M. G
6	Impacts to lichen communities downwind of two coal-fired power plants in Colorado's park range: Evaluation monitoring of detected impacts	Peter Neitlich	http://fhm.fs.fed.us/posters/posters01/lichen.pdf	
7	Fire Risk Rating of FIA/FHM Plots	David C. Atkins	http://fhm.fs.fed.us/posters/posters01/mtfia.pdf	
8	Factors affecting tree health in forested wetlands of Louisiana	Richard Goyer		
9	WA Swiss Needle Cast Survey	Dan Omdal	http://fhm.fs.fed.us/posters/posters01/swiss.pdf	
10	Balsam Woolley Adelgid Survey for Occurrence & Impacts	Iral Ragenovich		
11	Geographic Distribution of Champion Mine Strain of white pine blister rust	Rich Sniezko	http://fhm.fs.fed.us/posters/posters01/geo.pdf	
12	Evaluation of ozone foliar injury and bole growth of pines in southern CA	John Pronos	http://fhm.fs.fed.us/posters/posters01/lt.pdf	Campbell, Sally; S John; Rochefort, R Monitoring for ozo Washington, Calif PNW-GTR-495. P Agriculture, Forest Station. 19 p.
13	Fire Risk Rating of FIA/FHM Plots	David C. Atkins		
14	Determine the Condition of Whitebark Pine in the Northern Region	David C. Atkins	http://fhm.fs.fed.us/posters/posters01/whitebark.pdf	
15	Determining the Ozone Sensitivity of New Bioindicator Species for the Biomonitoring Program	Gretchen Smith	http://fhm.fs.fed.us/posters/posters01/ozone.pdf	

General Technical Report

- Abstract
- Introduction
- Description of Forest Health Monitoring Program
- History of Evaluation Monitoring Projects
- Evaluation Monitoring Results and Accomplishments
  - National Trends
  - Subject Chapters
  - Utilization of Evaluation Monitoring Projects' Results
- Recommendations
- Conclusions
- Literature Cited
- List of Evaluation Monitoring Posters
- Appendix A: Base and Fire EM Projects (1998 – 2007)
- Appendix X: 2009 Request for Proposals and Instructions
- Appendix X: Evaluation Monitoring Proposal Instructions 2009

Subject Chapter Authors

Climate Stresses – *Frank Koch, Paul Hennon*
Interior West Diseases - *Blakey Lockman,Kelly Burns, Mary Lou Fairweather*
Interior West Insects - *Steve Munson, Jose Negron, Joel McMillin*
North Eastern Insects - *Bob Rabaglia, Brad Onken*
North East Diseases - *Margaret Miller-Weeks, Mike Ostry*
North Central Insects - *Steve Katovich*
North Central Diseases - *Joe O'Brien, Bruce Moltzan*
Southern Insects - *Steve Clarke, Don Duerr*
Southern Diseases - *Bruce Moltzan*
West Coast Diseases - *Greg Filip, Susan Frankel, Ellen Goheen*
West Coast Insects - *Beth Willhite, Andy Eglitis*
Ozone - *Anita Rose*
Lichens - *Sarah Jovan*
Crowns - *Bill Bechtold, KaDonna Randolph*
Down Woody Material - *Chris Woodall*
Soils - *Hobie Perry*
Tree Mortality - *Mark Ambrose, Jim Guldin*
Invasive Plants - *Dave Bakke, John Taylor*
Fire Effects - *David Azuma, Lisa Fischer, Terry Jain, Linda Heath, Ken Outcalt, Roger Ottmar, Kevin Ryan*

Key Findings - *Example*

Climate Stresses

- Above normal crown dieback related to above normal freeze/thaw and extreme cold frequencies in Northeastern hardwood forests
- Snowpack depth related to onset and recovery from crown dieback
- Decrease in growth rate and increase in mortality rate of Southeastern pines with increasing drought severity
- Carbon gain was significantly lower under severe drought for red maple in Southeast
- Sudden decline of birch related to drought stress in AK
- Dieback of yellow cedar related to depth of snowpack in AK

Suggested Future Evaluations - Example

- Relate forest health indicators to patterns observed in many climate-related phenomena, whether extreme events (e.g., ice, wind, or lightning storms) or broad climatic trends
- Expand geographic scope of climate effects evaluations
- Construct models of future climate-related disturbances

Evaluation Monitoring Synthesis

- Future Plans
  - Complete General Technical Report
  - Upload searchable database to website
  - Continue gathering information on Regional Projects