

# Managing Forests for Climate Change Mitigation and Adaptation

*Cleaning the air, restoring the forest*



Forum on the Forests of Massachusetts

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Robert Perschel, Forest Guild Northeast Region Director

508-829-9984

[bob.perschel@verizon.net](mailto:bob.perschel@verizon.net)

# 10,000 Foot- Policy Level

- Climate Change and Forests of the Future: Managing in the Face of Uncertainty
  - Millar, et al, Ecological Applications 17(8), 2007, pp. 2145-2151

# Ground Zero- Forest Stand Level

- *Climate Change, Carbon, and the Forests of the Northeast*
  - *Perschel, Evans, Summers, Forest Guild December 2007*
- *A Review of Forestry Mitigation and Adaption Strategies in the Northeast*
  - *Evans, Perschel, Climatic Change, April 15, 2009*

# Policy and Management Options

- Adaptation Options
  - Create resistance to change
  - Promote resilience to change
  - Enable forests to respond to change
- Mitigation Options
  - Sequester Carbon
  - Reduce Emissions

# Adaptation Options (Millar)

1. Assist transitions, populations adjustments, range shifts, other natural adaptations
2. Increase redundancy and buffers
3. Expand genetic diversity guidelines
4. **Manage for asynchrony and use established phase to reset succession**
5. Establish “neo-native” forests

# Adaptation- continued

6. Promote connected landscapes
7. Realign significantly disrupted conditions
8. Anticipate surprise and threshold effects
9. Experiment with refugia

# Mitigation- Sequester Carbon

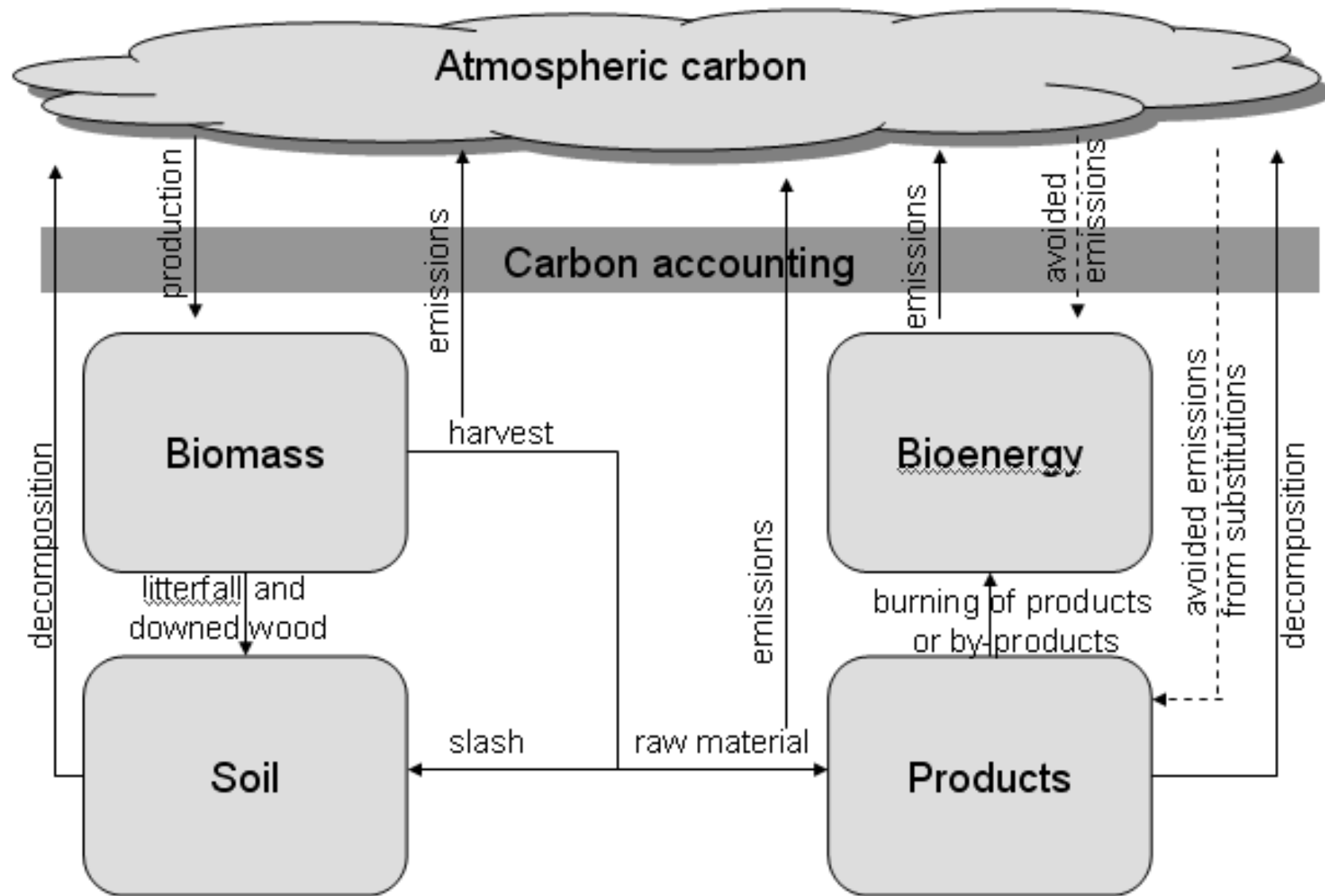
- Millar- “Some approaches duplicate long recognized best management practices, where goals are to maintain healthy vigorous trees, keep sites fully occupied with minimal spatial or temporal gaps in non forest conditions, minimize severe disturbance by fire, insects and disease.”
- Forest Guild- “Practice Excellent Forestry”

# Mitigation – Reduce Emissions

- Avoid wildfire and extensive mortality from insect and disease.
- Offset fossil fuels by using renewable, sustainably grown, forest biomass

# A Full Accounting of Carbon Sequestration from Forestry:

- Increase in carbon storage in the forest and in wood products
- Reduction in carbon emissions from use of biomass as an energy source
- Increase in substitution of wood products for carbon intensive products



# Forest Practices that Increase Carbon Sequestration on Forestland

- 1. Afforestation of agricultural land
- 2. *Reforestation of harvested land*
- 3. *Modification of management practices*
- 4. *Adoption of low impact harvesting*
- 5. *Lengthening rotation cycles*
- 6. *Preservation of forestland from conversion*

## Continued

- 7. Adoption of agroforestry practices
- 8. Establishment of short rotation plantations
- 9. Urban forestry practices
- Source: Stavins et al

# Forest Guild Massachusetts Carbon Recommendations

- Practice Excellent Forestry
  - Extended rotations
  - Increased structural complexity
  - Retention of growing stock
  - Low impact logging
  - Thinning regimes that remove mortality and grow larger trees
  - Restoration of under-stocked stands

# Management Recommendations: Continued

- Avoid carbon-degrading harvesting: high grading, diameter limit cutting and liquidation cutting, etc.
- Create and maintain forest reserves.

# Uneven-aged selection systems: Where adaptation and mitigation goals coincide.

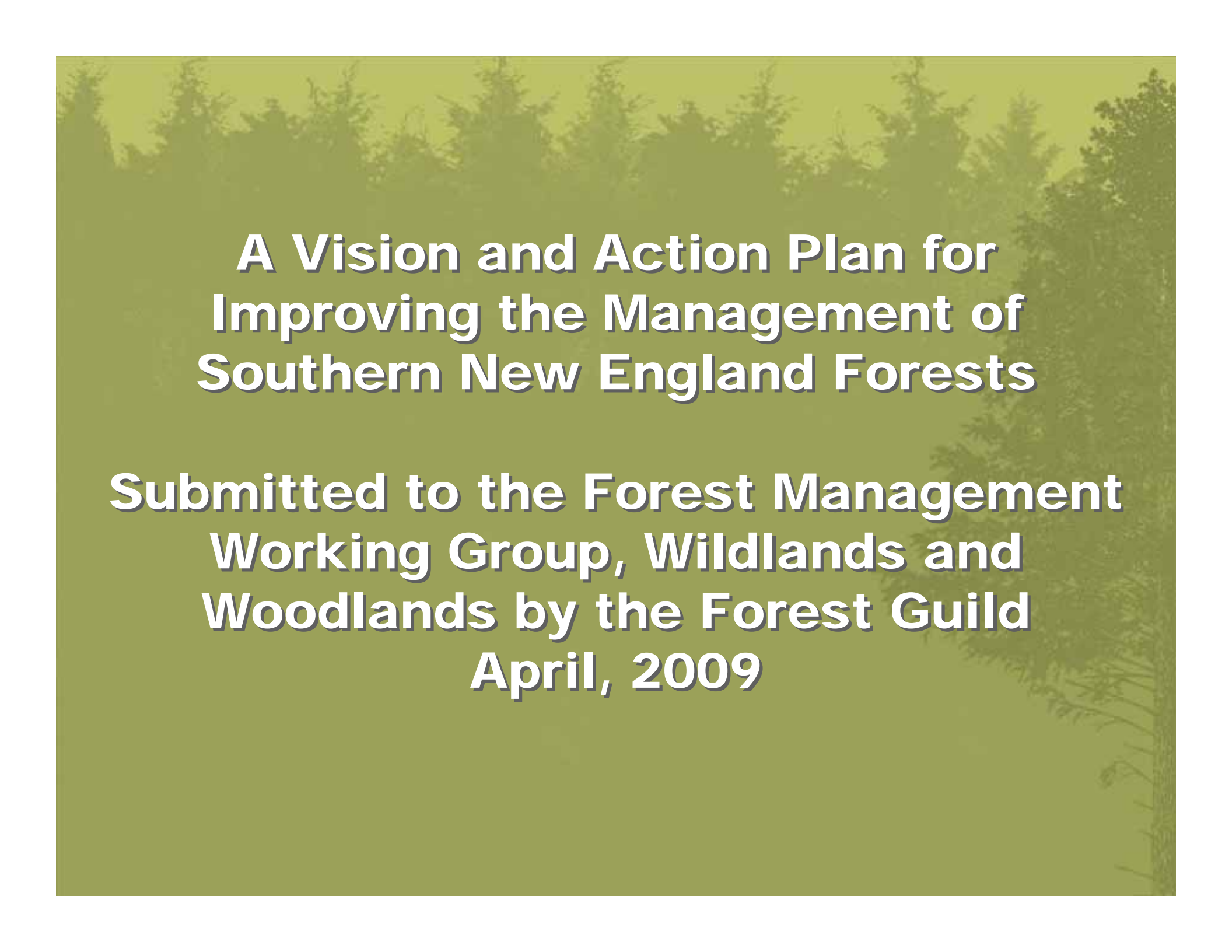
- 4. Manage for asynchrony and use established phase to reset succession

“Asynchrony achieved by promoting diverse age classes, species mixes, within stand and across landscape structural diversities, and genetic diversity.”

Millar, et al

# Carbon Credits- not the only way to achieve carbon sequestration

- State based regulations and incentives to practice Excellent Forestry
  - Stewardship planning
  - Current use tax programs
  - Liquidation harvesting laws- Maine
  - Cutting practices enforcement- MA
  - ETC....
- Sale of allowances = funds for forestry?



A Vision and Action Plan for  
Improving the Management of  
Southern New England Forests

Submitted to the Forest Management  
Working Group, Wildlands and  
Woodlands by the Forest Guild  
April, 2009

- **WHO MANAGES?**

- *Action Opportunity One:* Promote Licensed Foresters as the right choice for management and harvesting supervision.

- **MITIGATION**

- **APPROPRIATE USE OF BIOMASS**

- *Action Opportunity Two:* Establish ecological, science-based standards for biomass harvesting and retention.
- *Action Opportunity Three:* Promote small scale, community based use of woody biomass.
- *Action Opportunity Four:* Encourage the local use of forest products – including forest biomass.

- **MITIGATION/ADAPTATION**

- *Action Opportunity Five:* Increase the education and awareness of private forest landowners to manage their forestland better and provide incentives for them to do so.
- *Action Opportunity Six:* Promote uneven aged selection system management within the professional forestry community.

# SUMMARY

- Empower and utilize licensed foresters
- Develop forest stands of increasing volume/carbon, diverse structures, ages, species and overall health.
- Rule of Thumb: In the future Massachusetts forests should have more carbon, higher sawtimber volumes with increased value.