California Department of Forestry and Fire Protection

California Environmental Protection Agency

Air Resources Board

Forest Inventory Symposium
Forest Sector Greenhouse Gas Accounting and Assessment
Byron Sher Auditorium, Cal/EPA Sacramento, CA

October 19, 2009
8:30 a.m. – 5:00 p.m.

The Air Resources Board staff developed a statewide greenhouse gas inventory which accounts for emissions from all major economic sectors in the State, including the forest sector. The forest sector inventory is unique in that it estimates both emissions and sequestration of greenhouse gases statewide. The 2004 inventory was used in the AB 32 Scoping Plan adopted by the Air Resources Board in 2008.

The Scoping Plan acknowledged that additional research studies and methods would improve the statewide estimates of carbon sequestration from California's forests and rangelands, as well as estimates of carbon stock in forests. The purpose of this symposium is to provide a series of panel discussions with experts in the field to discuss key issues related to forest sector accounting, and identify opportunities for improving the quantification of current and future California forest carbon stocks, carbon balance, and land-atmosphere greenhouse gas exchange.

Introductory Remarks 8:30-8:45 (Linda Murchison - ARB)

Session 1: 8:45-9:15 **Introduction and Background**

Introductory Concepts: Overview of the forest carbon cycle – biomass, material and energy flows, CO2 fixation and loss, forest disturbance processes (Dennis Baldocchi – UC Berkeley and Beverly Law – Oregon State University)

ARB's Forest Sector Greenhouse Gas Inventory
The forest sector inventory used for the Scoping Plan tracks the removal of CO_2 from the atmosphere by forests and rangelands and emissions of greenhouse gases to the atmosphere by processes including decomposition and combustion of residues from harvest and conversion/development, wild and prescribed fire, and wood products decomposition. (Presentation by ARB staff)

Key questions the session will address:
- What method did ARB use to determine the overall CO_2 net balance?
- What emissions are included in the forest sector inventory?
- What's the source of the data used?
- What are potential areas for improvement?

Session 2: 9:15-12:00 **Carbon Stocks, CO_2 Removal, and Greenhouse Gas Emission Processes**

Estimating ecosystem carbon stocks, stock changes, and gas fluxes is essential to developing forest greenhouse gas inventories. Emission and removal processes in forests are described for the major ecosystem stocks and processes, organized by ecosystem components, including forest biomass, dead organic matter, and soils.

Key questions the session will address:

- What forest ecosystem processes and non-forest pools are important to carbon cycle accounting?
- Which estimation methodologies are appropriate for various carbon cycle components?
- How practical is each estimation methodology for use in an integrated, annually updated inventory and monitoring system?
- How have other carbon or greenhouse gas inventory systems addressed the forest emissions and sequestration?

Session presentations (20 min. each):

- Remote Sensing Approaches to Forest Biomass Assessment (Patrick Gonzalez – UC Berkeley)
- Direct Forest-Atmosphere greenhouse gas flux measurements (Dennis Baldocchi – UC Berkeley)
- Estimating greenhouse gas emissions from wildland fires (Leland Tarnay – National Park Service, Yosemite NP)
- Determining landscape-scale carbon emissions from historically harvested forest products (Sean Healey – USDA-FS; Todd Morgan – University of Montana)
- Regional Synthesis Activities – Measuring and modeling forest carbon and greenhouse gases: NASA ECOCAST (Forrest Melton); NASA Carnegie Ames Stanford Approach (CASA) (Chris Potter)
- Discussion

Lunch: 12:00-1:00

Session 3: 1:00-2:30 **Land Inventories in California: Fundamental to Greenhouse Gas Inventories**

Consistent surveys, sampling, categorization, reporting, and mapping of land types and land cover over time, and detecting and attributing change (fire, conversion, harvest, etc.), are fundamental to estimating biomass, carbon stocks, stock changes, land-atmosphere CO_2 exchange, and greenhouse gas emissions.

Key questions the session will address:

- What are the current forest inventory mapping efforts?
- How are current forest inventories and mapping efforts being implemented?
- What information is provided, how often, and at what level of accuracy?

Session presentations (20 min. each):
- Forest Inventory and Analysis Program and the National Resources Inventory (Glenn Christensen – USDA Forest Service – Pacific Northwest Research Station)
- California's Urban Forests (Greg McPherson – USDA-Forest Service)
- Land Cover Monitoring and Mapping Program (Mark Rosenberg – CAL FIRE-FRAP)
- Discussion

Break: 2:30-2:45

Session 4: 2:45-4:00 **Monitoring and Tracking to Evaluate Maintenance of Carbon Stock**

Monitoring and tracking of changes in carbon stock is integral to evaluating the maintenance of a no-net-loss goal for forests.

Key questions the session will address:
- What are the major sources of carbon stock loss?
- What current monitoring and reporting practices exist that can be used to better track changes on an annual basis?
- What are the appropriate monitoring techniques to adequately assess progress toward a no net loss goal?

Session presentations (20 min. each):
- Current regulatory and statutory tracking and reporting programs at the State level (Cathy Bleier - CAL FIRE)
- Tracking and reporting programs at the Federal level (Lisa Fischer, Carlos Ramirez – USDA-FS, Region 5)
- Monitoring and tracking no-net-loss in California's forests (Michelle Passero, Dick Cameron – The Nature Conservancy)
- Discussion

Session 5: 4:00-5:00 **Future Scenarios of Forest Condition**

Future forest carbon stocks, CO2 removal and greenhouse gas emissions are influenced through climate forcing, natural disturbance, competition, and a variety of anthropogenic actions such as forestation, conversion, harvest, and species choice. Accurate projections of future stocks and greenhouse gas fluxes are critical to understanding the forest carbon cycle and to developing and evaluating strategies to manage greenhouse gas emissions and sequestration.

Key questions the session will address:
- How much of a moving target is our forest and how much change is expected in the future?
- What adjustments to an inventory and monitoring program might be necessary when considering a dynamic rather than a static forest condition?

Session presentations (20 min. each):

- Future forests of California: CEC-PIER Scenarios Project (Dick Cameron – The Nature Conservancy)
- Future Conditions in California's National Forests (Bruce Goines – USDA Forest Service, Region 5)
- Discussion

Concluding Remarks (Linda Murchison - ARB)