CARBON ACCOUNTING IN NATURAL & WORKING LANDS
Insights for Oregon Global Warming Commission

James Mulligan, Senior Associate, World Resources Institute
NET ZERO IS THE DESTINATION
OPTIONS FOR NWL GOAL-SETTING

01 Fold into State-Wide GHG Goal Relative to 1990 Baseline
- Relative metric is net sequestration \textit{minus} 1990 net sequestration
- Need wall-to-wall land sector inventory
- Need to back-cast to 1990

02 Establish Separate Sectoral GHG Goal Relative to Historical Baseline
- Relative metric is net sequestration \textit{minus} baseline year net sequestration
- Can select a different baseline year with better data
- Can select specific NWL sectors (e.g., forests, ag)

03 Establish Separate Sectoral GHG Goal in Absolute Terms
- Relative metric is net sequestration
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04 Establish Separate Goals for Indicator Metrics
- Metrics could be acres of practice implementation, trees planted...etc.
- Can select specific NWL sectors (e.g., forests, ag)
- Not measuring what ultimately matters (GHGs)
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04 Establish Separate Goals for Indicator Metrics
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- Can select specific NWL sectors (e.g., forests, ag)
- Easier to track but not measuring what ultimately matters (GHGs)
DEFAULT APPROACH: EPA STATE INVENTORY TOOL (SIT)

Advantages

➔ Free & easy to use off-the-shelf
➔ Underlying datasets are consistent with National GHG Inventory
➔ Customizable with default and state-specific data

Limitations

➔ No state-level estimates of uncertainty
➔ Outdated default data (5-20+ yrs old)
➔ Coarse spatial resolution at the sub-state level (e.g. county, forest type, ownership class)
➔ Agricultural soils not disaggregated
➔ Incomplete coverage of emissions from land use change
➔ No coverage of wetlands
➔ Does not account for projected changes in emissions
MAPPING POTENTIAL INVENTORY IMPROVEMENTS

Trees & Forests
- Reduce uncertainty
- Improve temporal resolution
- Improve spatial resolution
- Capture trees outside forests

Option 1: Increase density or frequency of FIA plot measurements
Option 2: Integrate satellite imagery tools
Option 3: Integrate LiDAR and/or Digital Aerial Photo (DAP)
Option 4: Refine accounting for wood products

Agricultural Soils
- Enhance timeliness and accuracy of practice detection
- Enhance accuracy of carbon flux estimates

Option 1: Integrate remote sensing for croplands
Option 2: Expand transect surveys
Option 3: Institute farm-level reporting
Option 4: Create a plot network for soil carbon monitoring
Option 5: Model GHG fluxes on ag lands

Wetlands
- Capture wetlands in inventory

Option 1: Develop state database of wetlands
FEDERAL ACTION: Estimate GHG from spatial database

Land Use Change
- Enhance timeliness of forest and grassland loss estimates
- Enhance timeliness of accounting for reforestation

Option 1: Incorporate info from available federal/state databases, e.g., NLCD
Option 2: Implement monitoring system, e.g., using LiDAR or DAP

Baselines
- Increase scope and accuracy of area estimates for land use change
- Develop a projected baseline

Option 1: Build on projections from 2020 Resources Planning Act (RPA)
Option 2: Make use of state-specific modeling
INVENTORY RECOMMENDATIONS

01 SET GOALS
➔ First determine form and boundary of goal(s)
  ➔ E.g., fold into economy-wide goal or create separate sectoral goal
  ➔ Then set the ambition of your goal(s) – opportunity assessment or baseline projection as needed

02 ESTABLISH BASIC INVENTORY SYSTEMS
➔ EPA SIT, or better yet replicate SIT with readily available federal datasets
  ➔ Available from USFS, Colorado State University

03 CONSIDER IMPROVING INVENTORY METHODS IN PRIORITY AREAS
➔ Focus on large sources of flux, areas with potential for large changes in flux

04 ESTABLISH SYSTEMS TO TRACK INDICATOR METRICS
➔ Programmatic reporting, remote sensing, landowner surveys, permit data…etc.

05 HELP US YELL AT THE FEDS
➔ To improve national datasets for inventories