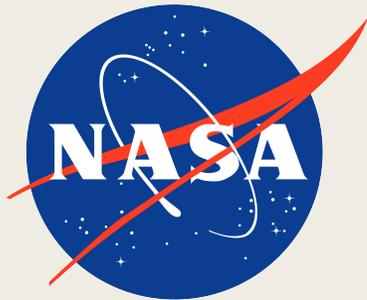


Sub- National Context For Integrating Forest Carbon Into Climate Mitigation Planning



DEPARTMENT OF
GEOGRAPHICAL
SCIENCES

State Climate Action in Region



Strong climate ambition throughout the region



Strong commitments to collaboration and partnership (USCA NWL, RGGI)



Ongoing interest in land carbon science and integration



Where are we on forest carbon science and policy? Where might we go from here?

Sources of Data

- Review of presentations from MSWG members
- Review of synthesis reports from telecons
- Review of most current published climate action plans and GHG inventories

Categories of Data Collection

- Executive and Legislative Mandates
- GHG Reduction Goals
- Climate Action Plan or Framework Document
- Inclusion of Forest Carbon towards GHG Reductions
- Current Source of Forest Carbon Science
- Stated Needs for Forest Carbon Science

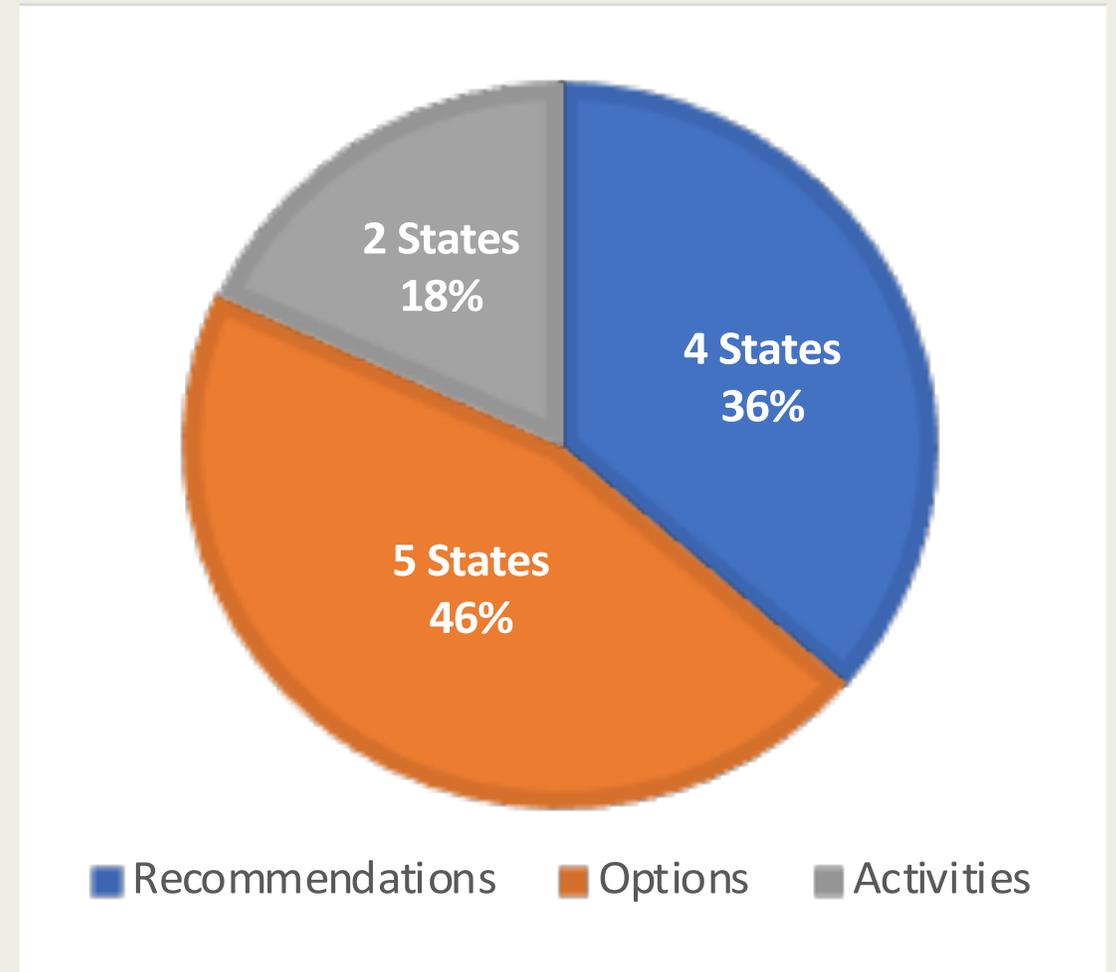
STATE-LEVEL SUMMARY

State	Policy	Targets	Plan	Key Actions	GHG Accounting	Inventory Data	Monitoring
Delaware	Change Planning and Resiliency (2018) Executive Order 3 (2019)						
	Executive Order 41 (2013)	30% below 2008 levels by 2030	Climate Framework for Delaware (2014) <i>Plan under development</i>	- Forest conservation and restoration (slow loss) - Restoring riparian buffers	Not included, but separately tracked within inventory	EPA SIT/GHG Inventory USFS FIA Data DE Forest Service Analysis NASA CMS Products	Annual carbon flux monitoring
Maine	Act to Provide Leadership in Addressing the Threat of Climate Change (2003) Executive Order 10 (2019)	10% below 1990 levels by 2020 45% below 1990 levels by 2030, 80% below 1990 levels by 2050, and carbon neutrality by 2045	Climate Action Plan (2004, update forthcoming 2020)	- Forestry management practices - Forest conservation (prevent conversion)	Included towards GHG reductions	USFS FIA Data USFS ForGATE Tool	Integration of remote sensing, improved forest monitoring, and integrated modeling
Maryland	Greenhouse Gas Emissions Reduction Act (2009, updated 2016)	25% below 2006 levels by 2020* 40% below 2006 levels by 2030 80 to 95% below 1990 levels by 2050**	Greenhouse Gas Emissions Reduction Act Plan (2013, 2015, draft update 2019)	- Forestry management practices - Reforestation/afforestation - Urban tree planting - Forest conservation (avoided emissions) - Planting forested riparian buffers - Preservation/restoration of forested areas on Ag land	Included towards GHG reductions	NASA-CMS Products USFS FIA Data NASA-USDA-DOE Study MDNR RAS Field Study MD Forest Service Analysis EPA SIT WRI-USCA Analysis	Annual carbon flux monitoring
Massachusetts	The Global Warming Solutions Act (2008)	25% below 1990 levels by 2020 80% below 1990 levels by 2050, and net zero emissions by 2050	Clean Energy and Climate Plan for 2020 (2010, 2015)	- Urban tree planting and retention	Not included towards GHG reductions, but tracking in appendix	Harvard Forest Field Studies MassGIS Analysis State Continuous Forest Field Inventory USFS FIA Data, USFS Reports Literature Values	Enhanced LiDAR capabilities to improve estimates of urban tree/forest carbon
New Hampshire	Executive Order 3 (2007)	20% below 1990 levels by 2025, 80% below 1990 levels by 2050	Climate Action Plan (2009)	- Forestry management practices - Forest conservation (prevent conversion)	Included towards GHG reductions	EPA SIT USFS FIA Data Hubbard Brook and Bartlett Forest Field Studies Integrated forest model	Improved valuation of forest ecosystem services, inclusive of forest carbon estimates
New Jersey	Global Warming Response Act (2007, updated 2019) Clean Energy Act (2018) Executive Order 89 (2019) Executive Order 100 (2020)	At or below 1990 levels by 2020, 80% below 2006 levels by 2050	Global Warming Response Act Limit Recommendations Report (2009, update forthcoming 2020)	- Forest conservation (no net forest loss)	Included towards GHG reductions	EPA SIT NCASI Carbon Online Tool USFS FIA Data Default IPCC Estimates	Improved estimates of land carbon flux, soil carbon data, and improved monitoring, measurement and verification methods
New York	Executive Order 24 (2009) Climate Leadership and Community Protection Act (2019)	40% below 1990 levels by 2030, 85% below 1990 levels by 2050, and net zero emissions by 2050 or as soon as practicable	Climate Action Plan Interim Report (2010) <i>Final plan under development</i>	- Forest management - Forest restoration - Urban forestry - Reforestation - Forest conservation (conserve open space, no forest loss)	Not included, but tracked separately as part of forest sector planning	USFS Technical Report USFS FIA Data	High-resolution estimates of forest carbon; biogenic emissions
Pennsylvania	Pennsylvania Climate Change Act (2008) Executive Order 1 (2019)	26% below 2005 levels by 2025, 80% below 2005 levels by 2050	Climate Change Action Plan (2009, 2015, 2019)	- Forest conservation - Reforestation - Urban tree canopy expansion	Included towards GHG reductions	USFS Technical Reports State Continuous Forest Field Inventory NASA CMS Products	Carbon sequestration potential; canopy change detection for monitoring; LiDAR applications
Rhode Island	Resilient Rhode Island Act (2014)	10% below 1990 levels by 2020, 45% below 1990 levels by 2035, 80% below 1990 levels by 2050	Rhode Island Greenhouse Gas Emissions Reduction Plan (2016)	- Forestry management practices - Urban tree planting	Not included towards GHG reductions	USFS Forest Carbon Budget model Grey Literature Values	More reliable land carbon data, fully understand mitigation potential of urban forests
Vermont	Vermont Statute 30 V.S.A. §	50% below 1990 levels by 2028	Comprehensive Energy	- Forestry management practices	Not included towards	USFS FIA Data	Annual flux monitoring, high

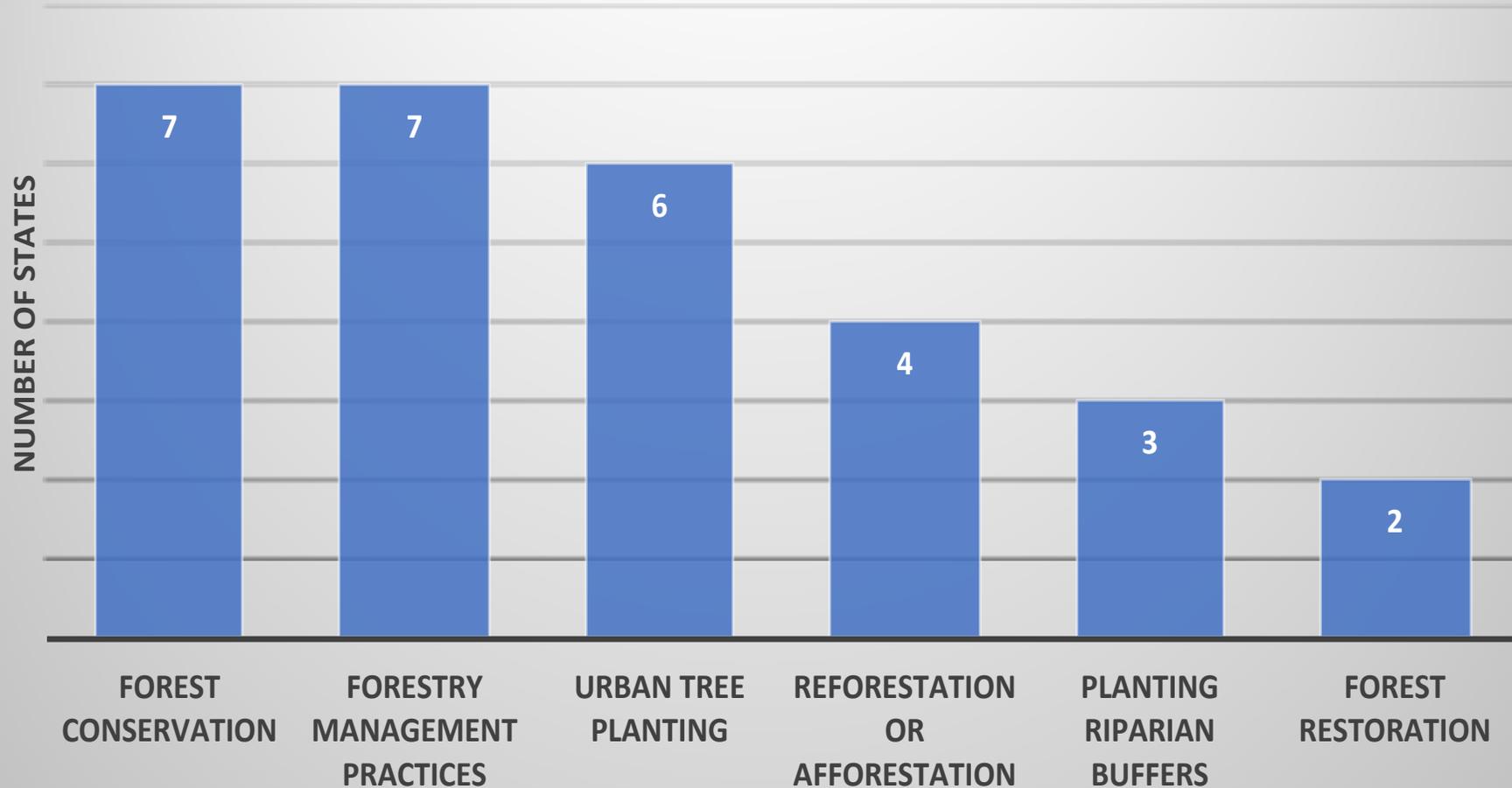
REGIONAL-LEVEL SUMMARY

Type of LULUCF Guidance Provided in Plan

- **General Recommendations:** for agencies to further design, plan and implement
- **Range of Options:** for agency implementation but do not necessarily represent planned activity
- **Specific Activities:** planned, and expected to be implemented by agencies and partners

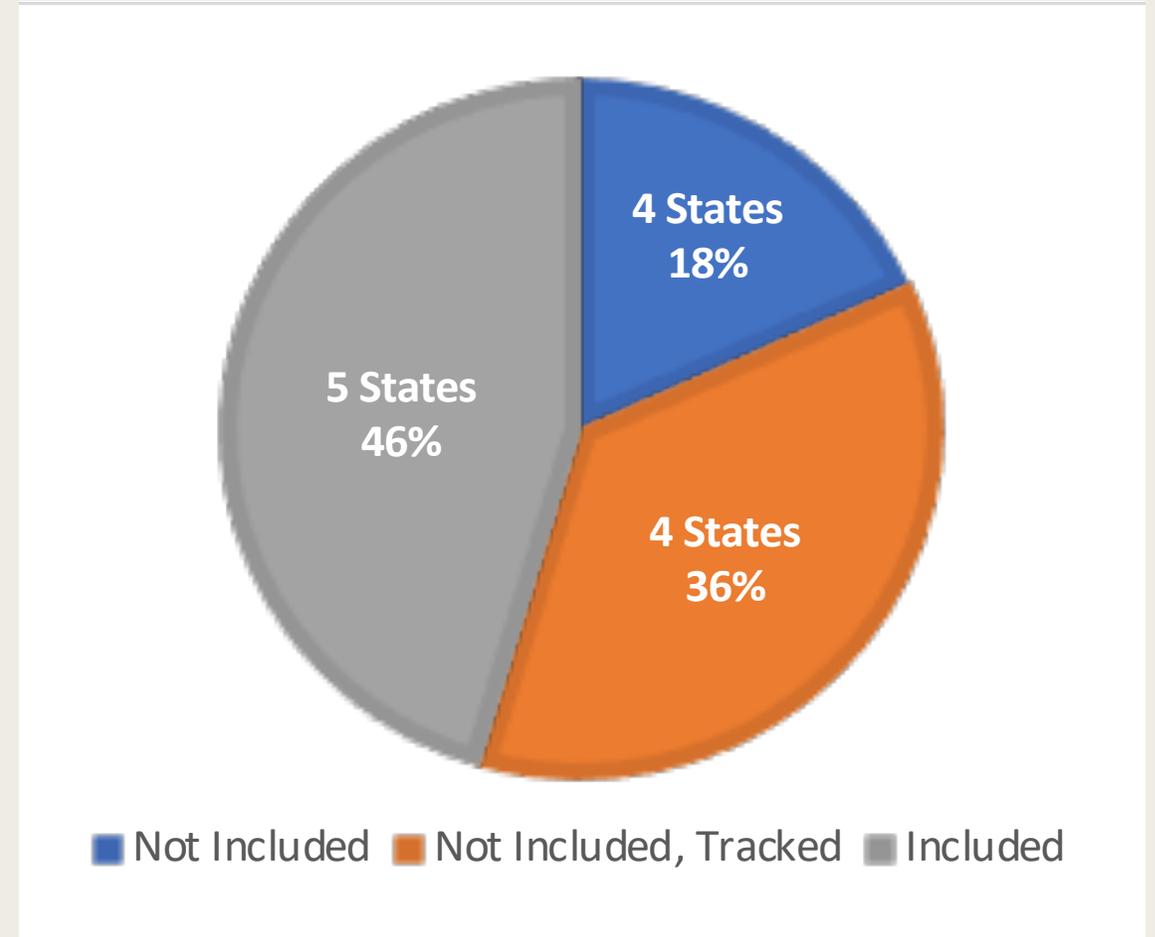


Range of Forest and Tree Terms Within Climate Mitigation Framework Document



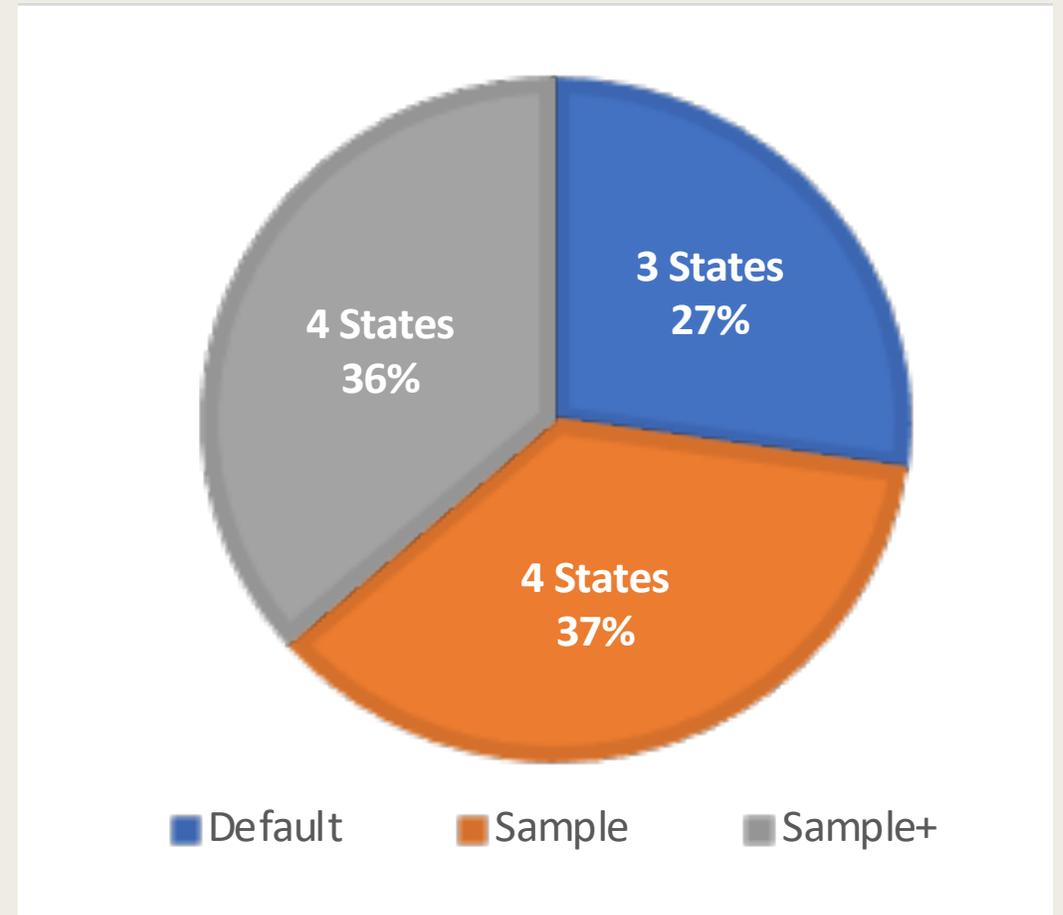
Level of Inclusion Relative to GHG Goals

- **LULUCF Not Included:** towards achievement of GHG reduction goals
- **LULUCF Not Included, Regularly Tracked:** within inventories or via separate analysis
- **LULUCF Included:** towards achievement of GHG reduction goals

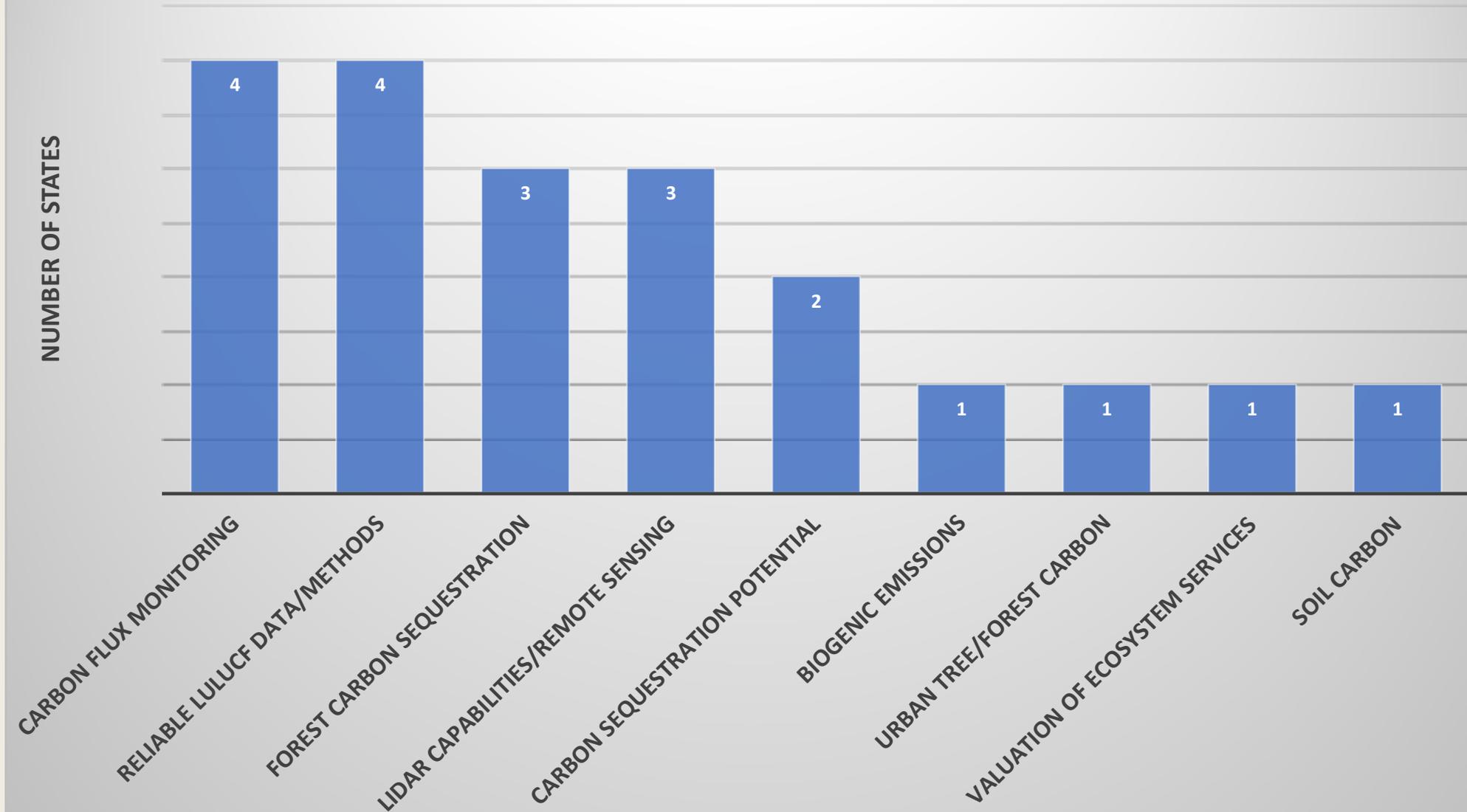


Primary Source of Forest Carbon Science

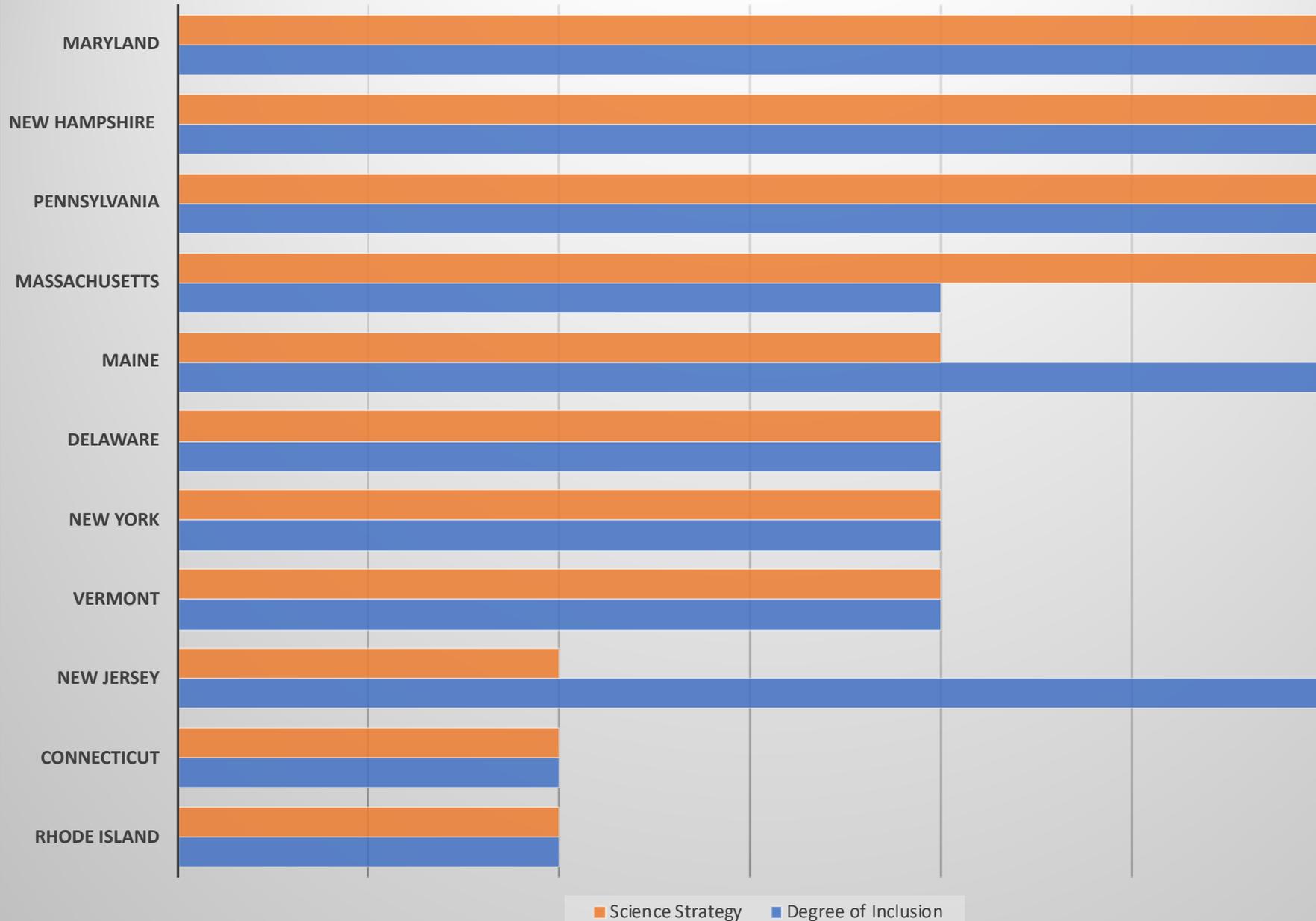
- **Default:** data directly from EPA SIT, static literature values or sample-based estimates from their region rather than their state
- **Sample:** utilize USFS FIA field data for their state directly or via USFS technical reports
- **Sample+:** USFS plus either high-resolution modeling or data from the state's own continuous forest inventory



Range of Science Needs Across Region



Relationship Between Primary Scientific Strategy and Degree of Inclusion Relative to GHG Goals



Science

- 1) Default
- 2) Sample
- 3) Sample+

Inclusion

- 1) Not Included
- 2) Not, Tracked
- 3) Included

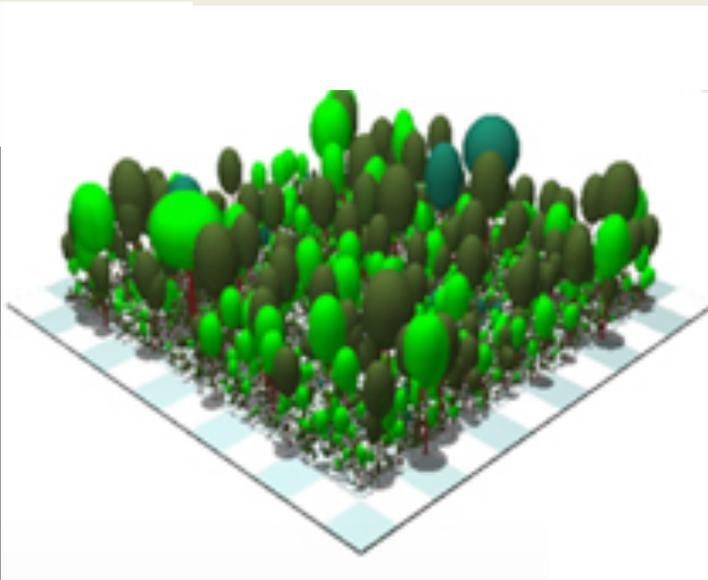
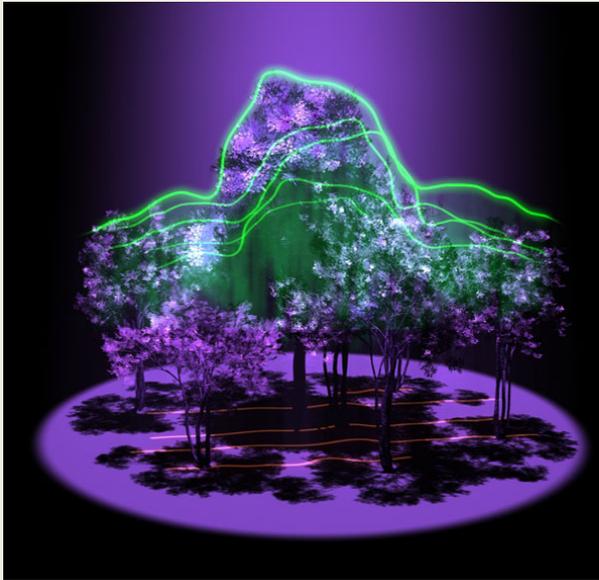
Differences, Diverse Actions, Range of Resources

- Considerable leadership and ambition
- Individual states advancing goals relative to local and regional resources
- Recognize the range of mandates, range of tree/forest terms relative to context

- Potential to create range of scientific strategies without ability for regional comparison
- Harnessing USFS FIA with room to address the gaps with remote sensing/modeling

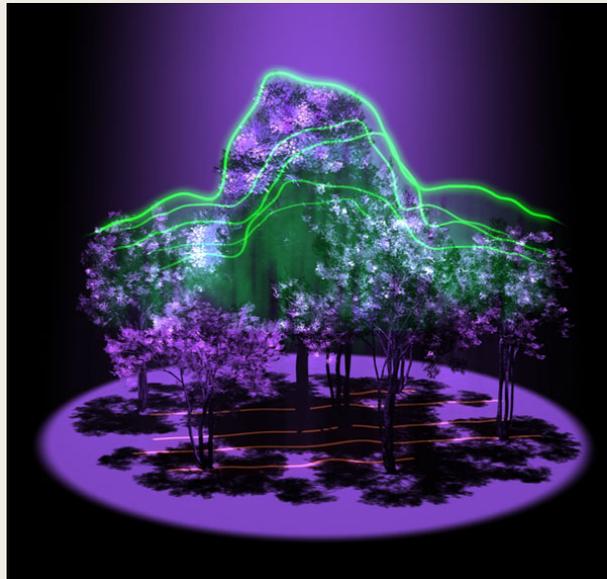
What might a shared system forest carbon monitoring system look like?

Differences, but Opportunities for Shared System?

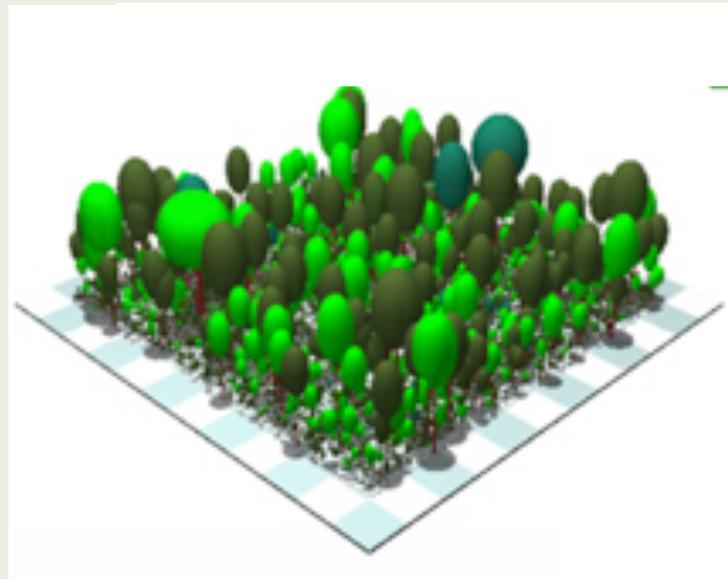


“transparent, annual, consistent, reliable, high-resolution, improved, inclusive”

Differences, but opportunities for shared system?



Mapping to Establish Baseline



Modeling to Facilitate Planning



Monitoring to Provide Assessment

Access to a multi-faceted system via national agency or private-public partnership

Next Steps

- Confirm accurate representation of context
- Invite co-authorship or mention within acknowledgements
- Share paper draft for further comment
- Continue discussion about ideal attributes of a shared system

Questions or further comments:

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