Oregon Natural and Working Lands: Blue Carbon Ecosystems

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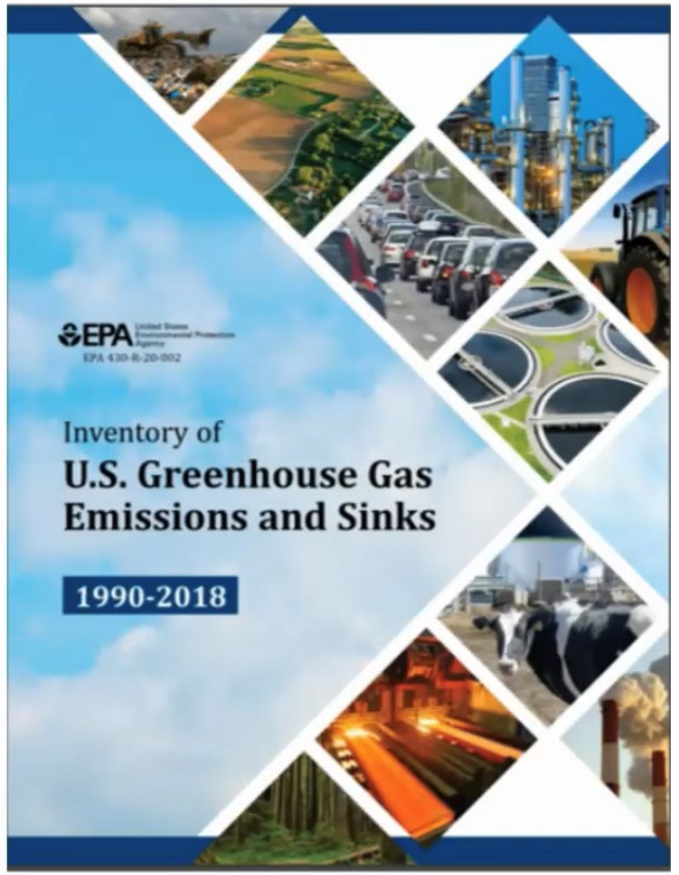
THE PEW CHARITABLE TRUSTS

silvestrum CLIMATE ASSOCIATES

Analysis Consistent with National Inventory

- NIR is the official U.S. Government source of data on GHG emissions and sinks
- Fulfills a commitment under the UNFCCC—due by April 15
- Policy neutral, but policy relevant
- Includes all primary GHGs: CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, NF_3
- Accounts for anthropogenic GHG emissions and removals over time: **1990 to the present**
- Five methodological chapters
  - Energy
  - Industrial Processes and Product Use (IPPU)
  - Waste
  - Agriculture (+ 3 Annexes)
  - Land Use, Land-Use Change and Forestry (+ 2 Annexes) } = AFOLU
- Interagency effort led by EPA's Office of Atmospheric Programs
  - Involves many other USG agencies (e.g., USDA-OEEP, USFS, ARS, NOAA, USGS) academic and research institutions (e.g., Colorado State Univ), industry associations and other EPA offices (e.g., ORD)
- Typical annual schedule
  - May: Assess and implement improvements
  - June to September: Assemble data, run models and compile estimates
  - October to November: Expert review
  - February: Open for 30-day public review
  - Mid-April: Submittal to UNFCCC (April 15 deadline)
  - Annual UNFCCC Expert Review also occurs every September



Ecosystem Benefits

- Habitat for fisheries and other wildlife
- Hunting and fishing grounds
- Water quality maintenance
- Flood risk reduction
- Quality of life and wellbeing
- Carbon sequestration

Photo: Laura Brophy, Mill Port Slough

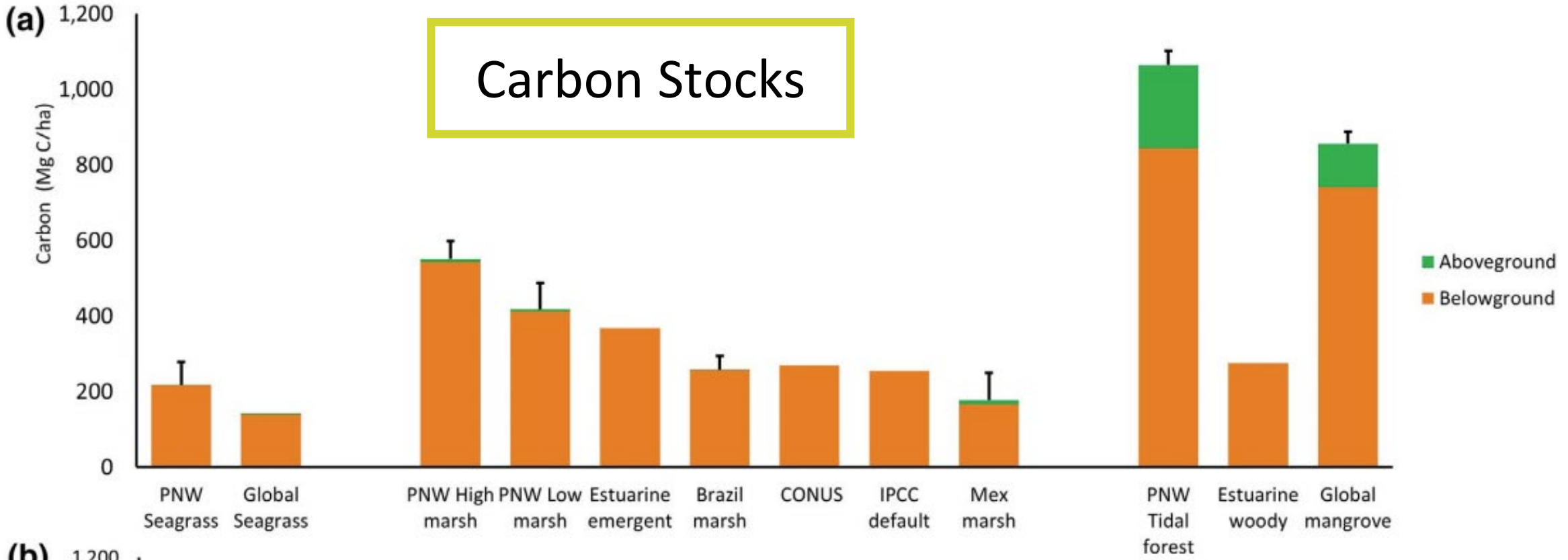
Extent of Wetland Loss

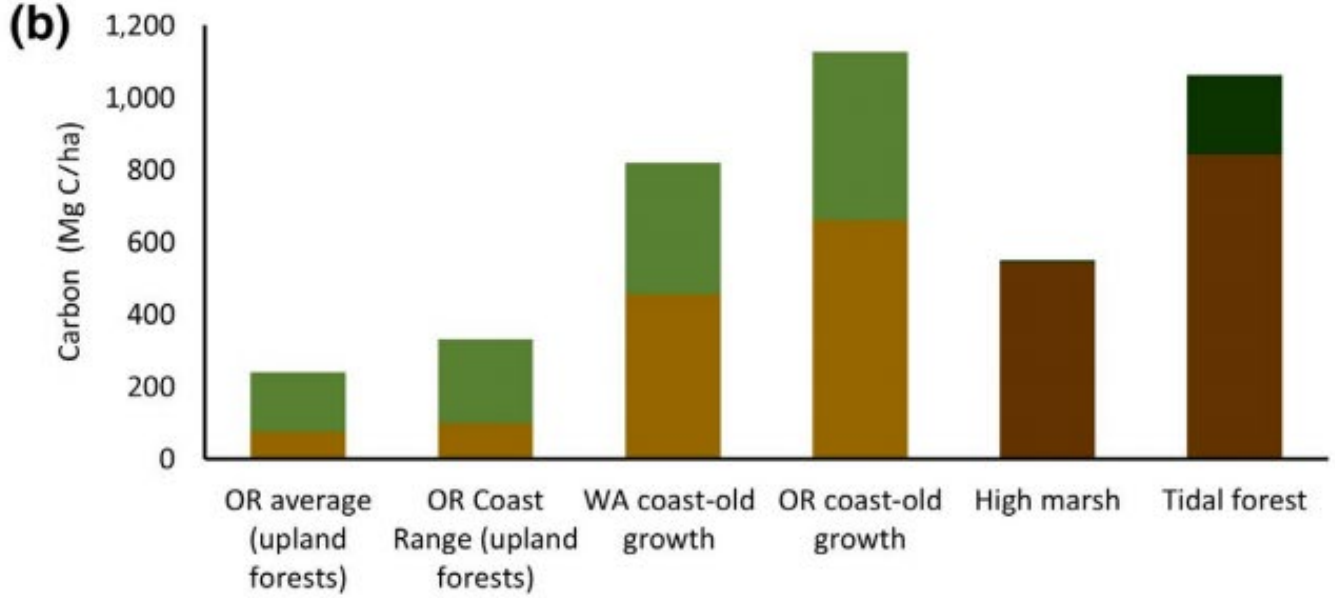
	Historical Tidal Wetlands		Current Tidal Wetlands	
Vegetation Class	**area (ha)**	**% historical area**	**area (ha)**	**% current area**
Tidal Emergent Wetland	24,858	54.4	10,426	62.5
Tidal Forested Wetland*	20,854	45.6	6,245	37.5
Total	45,712		16,671	

Photo: Laura Brophy, Low Tide in Coat Creek

Photo: Steve Crooks, diked wetlands, Coos Bay

Carbon Stocks





Message: Conserve remaining wetlands

Kauffman JB, Giovanonni L, Kelly J, et al. Total ecosystem carbon stocks at the marine-terrestrial interface: Blue carbon of the Pacific Northwest Coast, United States. Glob Change Biol. 2020;00:1–14.

Current Landcover Within Diked Areas

C-CAP Landcover	Diked areas (ha)	% of total area
Settlement	352	3.8
Cultivated	3,236	34.9
Grassland	64	0.7
Forest	164	1.8
Other	98	1.1
Palustrine Forested Wetland	370	4.0
Palustrine Scrub Shrub Wetland	424	4.6
Palustrine Emergent Wetland	4,502	48.6
Estuarine Emergent Wetland	54	0.6

Photo: Steve Crooks, diked wetlands, Coos Bay

Opportunities for GHG Removals

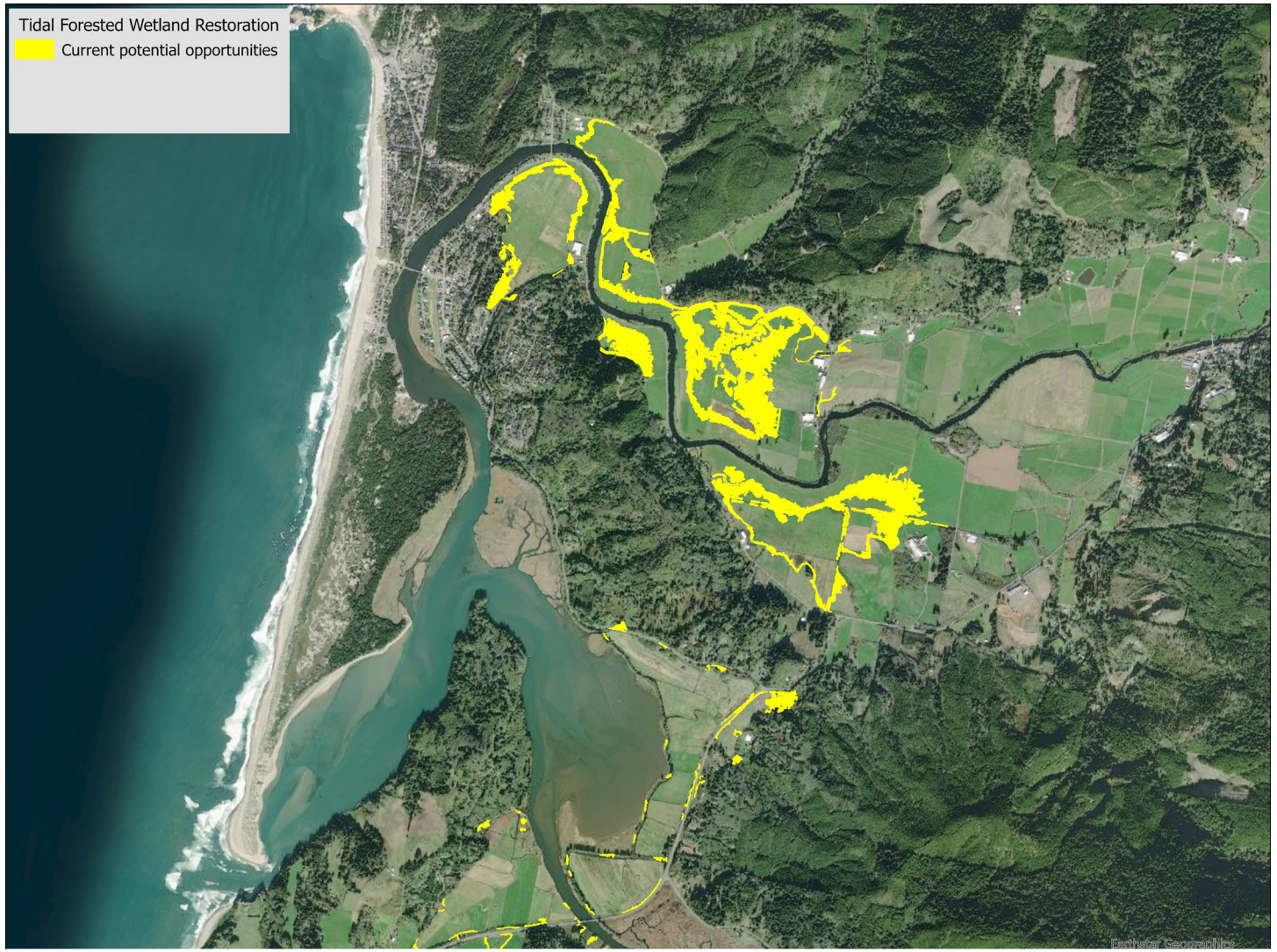
- **Tidal Forest**
  - Benefits: Clear GHG reductions, environmental gains, climate resilient, can be reforested prior to dike removal.
  - Cons: relatively small area

- **Tidal Marsh**
  - Benefits: Long term carbon sequestration, environmental gains, climate resilient
  - Cons: Unclear near-term GHG benefits (methane)

- **Seagrass**
  - Benefits: Small but positive carbon sequestration, environmental gains, climate resilient
  - Cons: limited mapping of extent and potential

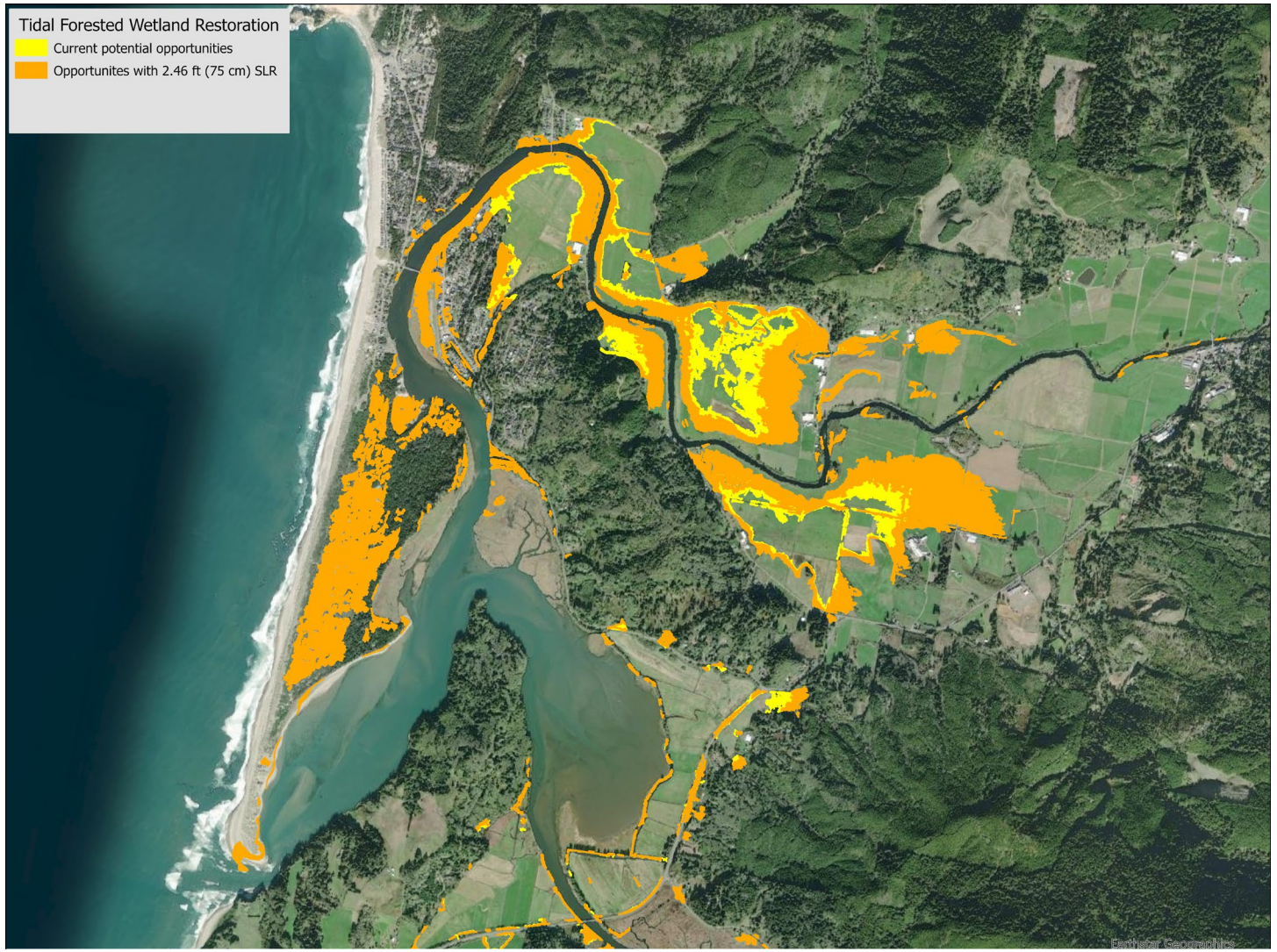
- **Seaweed Farming / Kelp restoration**
  - Benefits: Economic development, Carbon sequestration benefits
  - Cons: Not yet recognized in GHG Inventories, scale unclear

Tidal Forested Wetland Restoration Opportunities



Brophy unpublished data

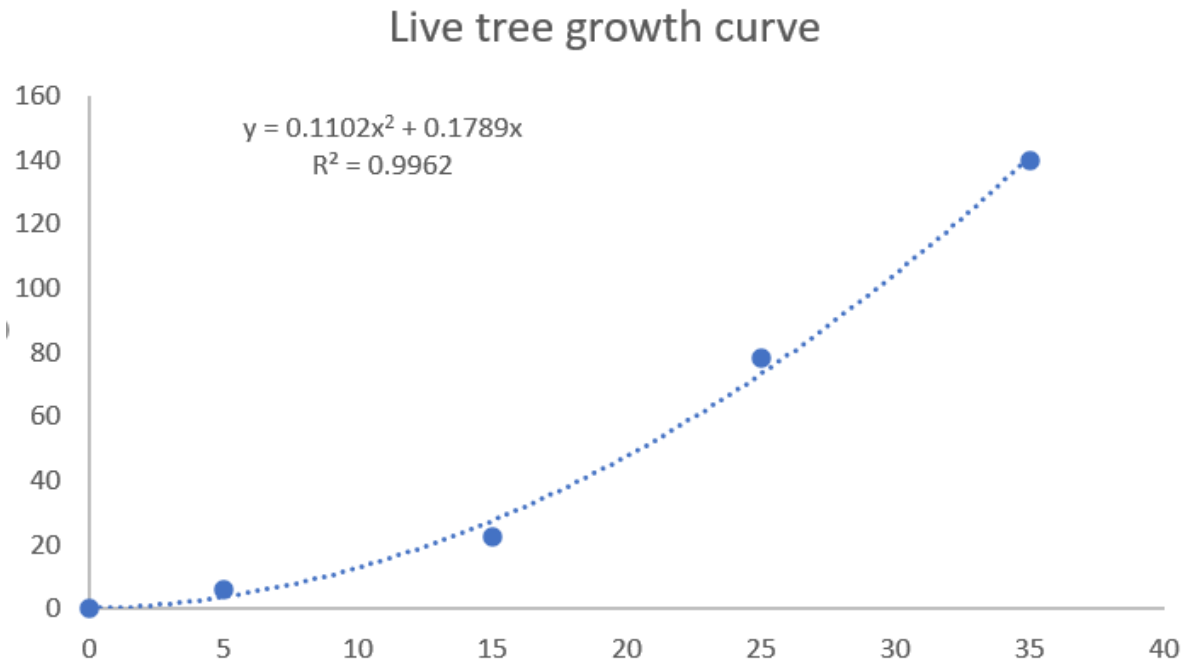
Tidal Forested Wetland Restoration Opportunities



Brophy unpublished data

Restoration of Forested Tidal Wetlands

Scenario	Potential area (ha)	Estimated CO_2 removals after 40 years (kt CO_2e)*
Current sea level	1,005	778
2.46 ft (75 cm) sea level rise	4,721	3,657



Takeaway messages

- Conserve remaining coastal habitats – highly carbon rich
- Restore wetlands – great ecosystem benefits, but not all clear GHG opportunities
- Restoring forested tidal wetlands, salt marshes and seagrass – clear benefits
- Space is limited
- Kelp farming may be an industry that brings both carbon benefits and jobs