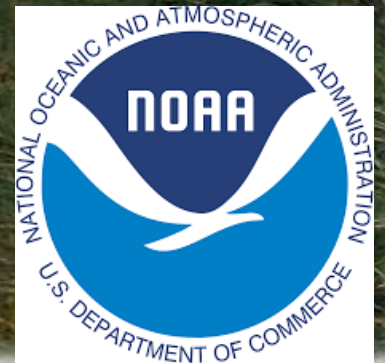


Salt Marsh Restoration and Climate Adaptation Strategies

**Danielle Perry, PhD
NOAA Restoration Center
October 18, 2024**

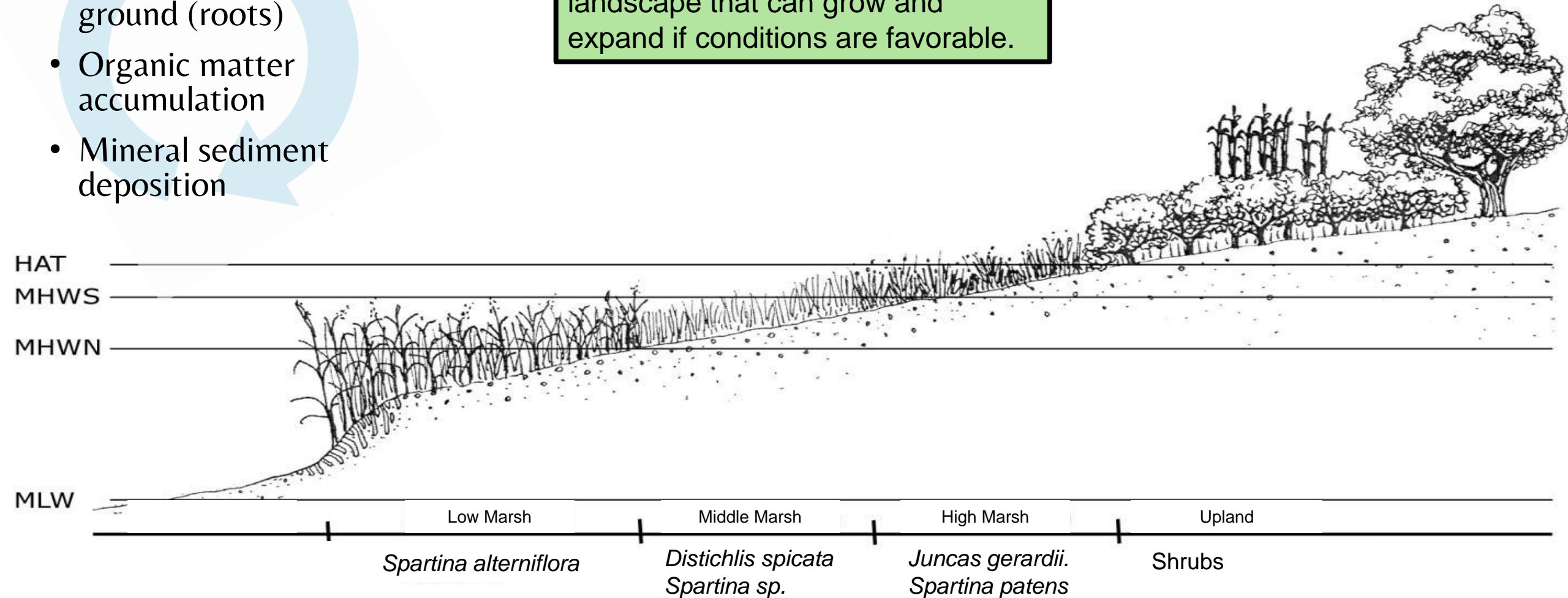


Salt Marsh 101

Marsh Growth/ Accretion

- Plant production above (leaves) and below ground (roots)
- Organic matter accumulation
- Mineral sediment deposition

Salt marshes occur where land and ocean meet. They are a dynamic landscape that can grow and expand if conditions are favorable.



Salt Marsh Importance

Buffer zone

- Filtration
- Reduce flooding
- Lessen wave energy

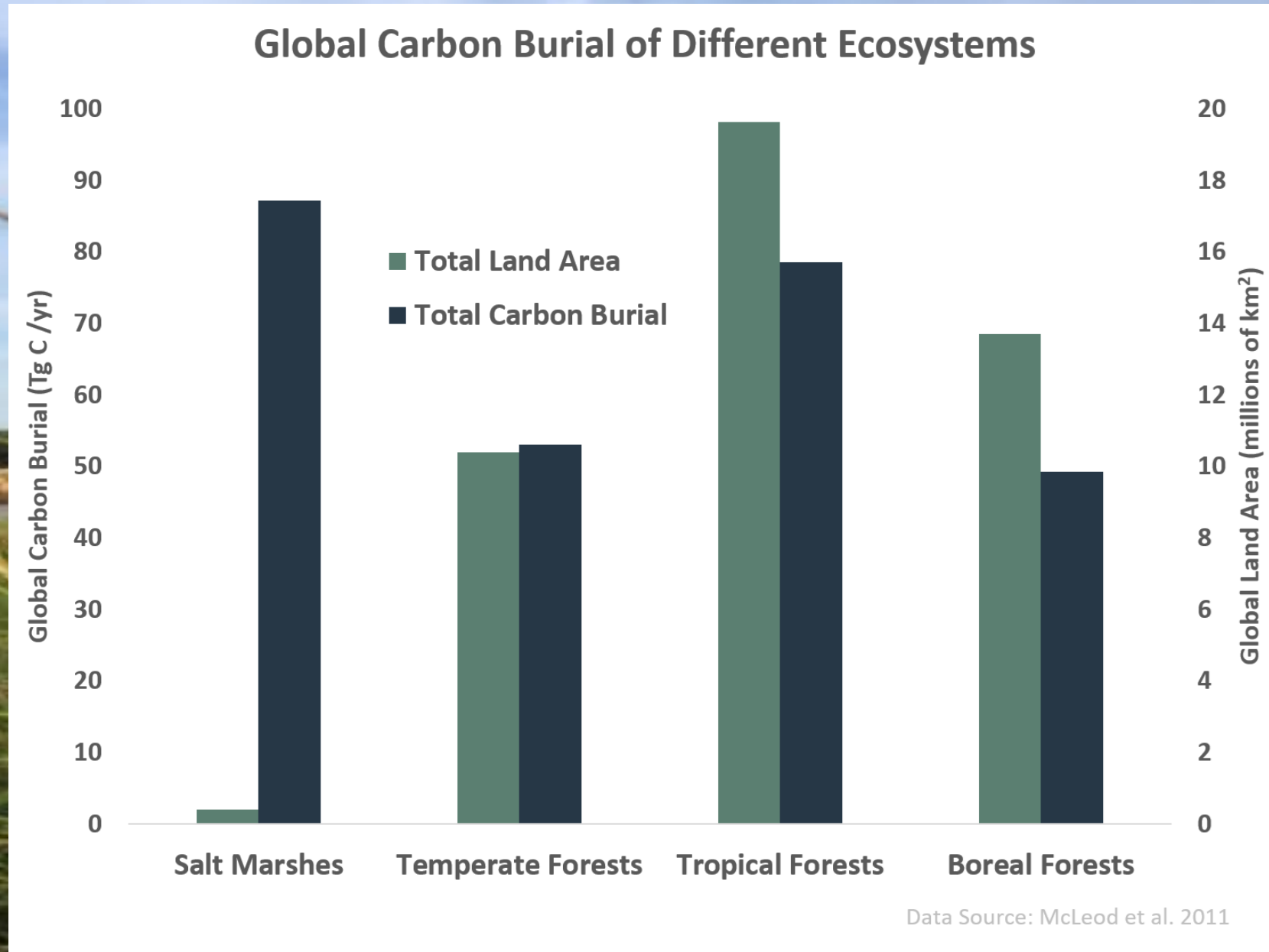
Resource for fisheries and bird species

- Refuge
- Food
- Nursery

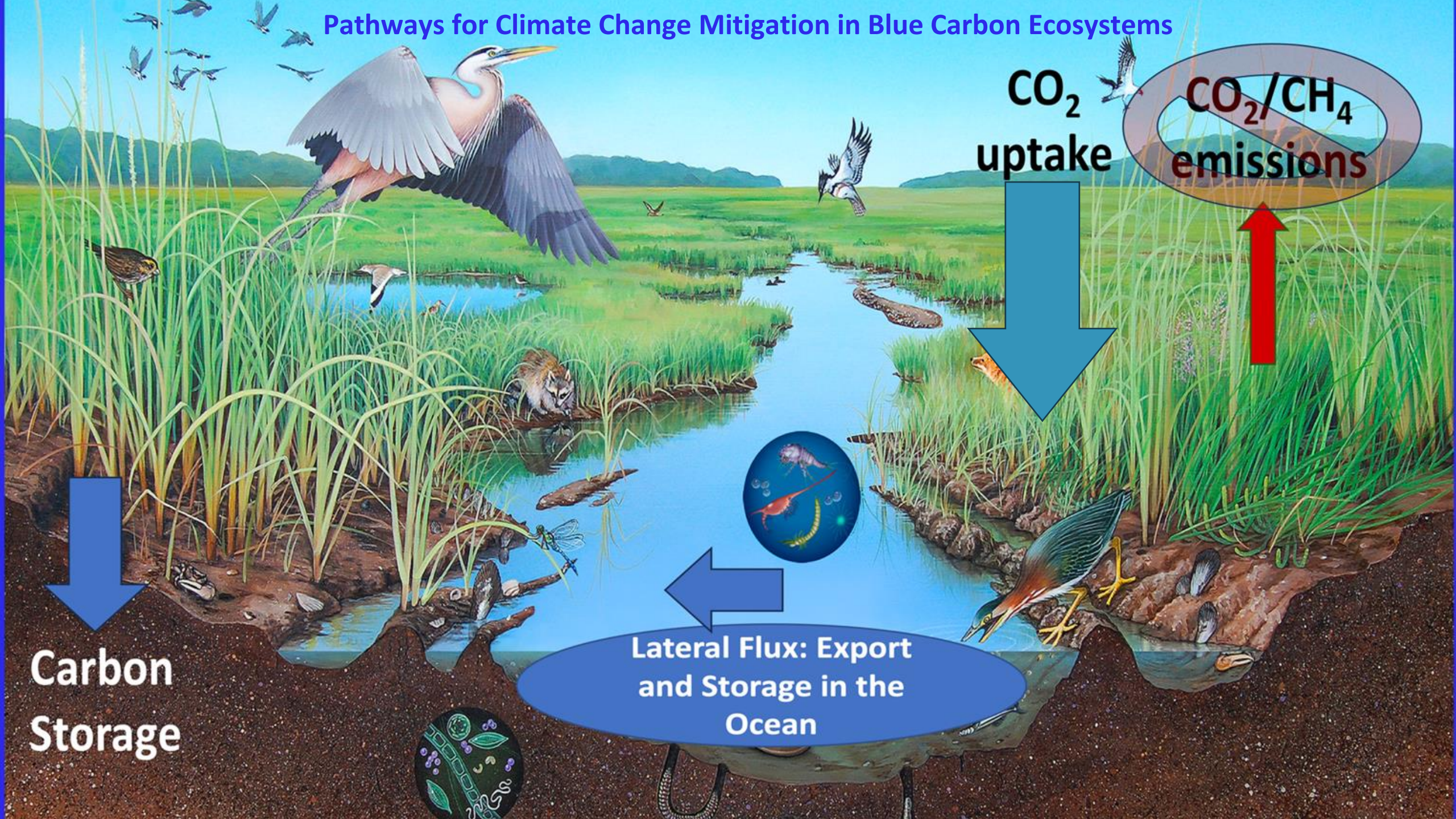


Carbon sinks

Salt Marshes as a Climate Solution



Pathways for Climate Change Mitigation in Blue Carbon Ecosystems



Sea Level Rise

Impacts

- Changes in plant cover
- Increase in plant death
- Ponding
- Marsh erosion

Response

- Salt marsh migration
- Coastal squeeze

Management

- Restoration
- Climate change adaptation



Restoration and Climate Change Adaptation Strategies

1. Hydrological Restoration

- Tidal Restriction Removal
- Runnels
- Ditch Remediation

2. Sediment Enhancement



Remediated Ditch



Runnel



Sediment Enhancement

Climate Change Adaptation and Restoration Strategies

1. Hydrological Restoration

- Tidal Restriction Removal
- Runnels
- Ditch Remediation



Runnel



Remediated Ditch

2. Sediment Enhancement



Sediment Enhancement

Culvert Upgrade: Eagle Neck Creek

- Restoration Actions
 - Installed 8' by 8' open bottom box culvert
 - Salt marsh monitoring
- Project Partners
 - Woods Hole Group
 - MA DER
 - Town of Truro
 - Fuss & O'Neill
 - USDA- NRCS
 - National Park Service



Salt Marsh Runnels

Runnel
Impact



Photo Credit. W.
Ferguson



Photo Credit. W.
Ferguson



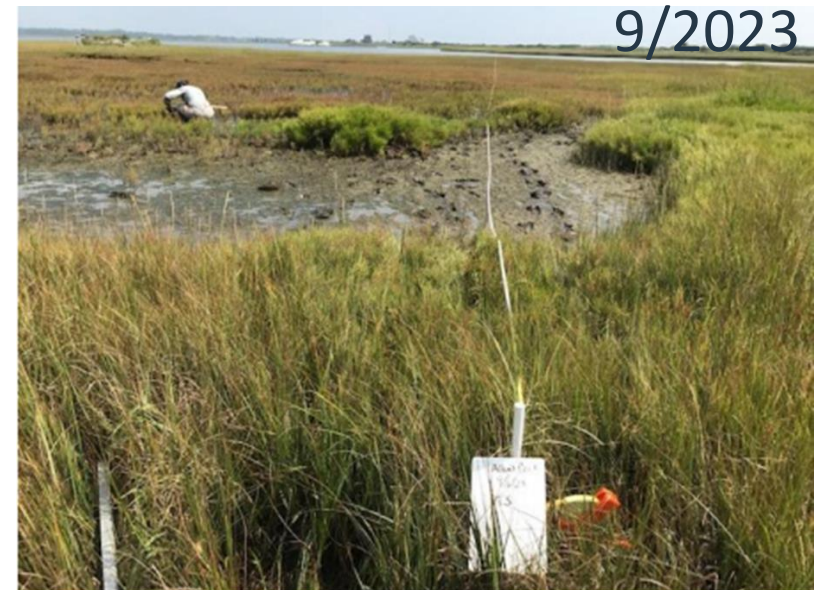
NOAA
FISHERIES



Parker River National Wildlife Refuge



Allens Pond Wildlife Sanctuary:



Ditch Remediation

Treated



May 2015
(before)

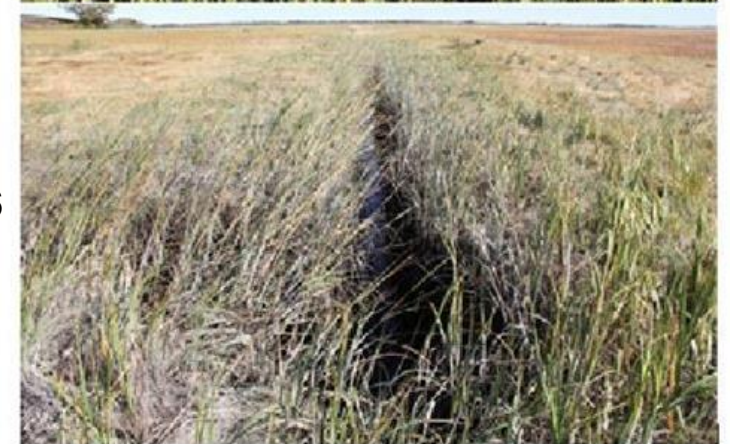


Sept 2015



Aug 2016

Untreated



Embankments and ditches - legacy effects of agriculture interacting with greater rates of Sea Level Rise:

- 1) Ditches lower water tables and allow oxygen to convert peat to CO₂ (elevation falls) marshes become more susceptible to drowning
- 2) Embankments from farming and ditch spoils hold water on the marsh, leading to plant die-off, mega-pools and elevation loss



**Subsidence is caused by Ditching
AND Embankments**

Parker River National Wildlife Refuge: Ditch Remediation October 2022



Climate Change Adaptation and Restoration Strategies

1. Hydrological Restoration

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Remediated Ditch



Runnel



Sediment Enhancement



NOAA
FISHERIES

Sediment Enhancement

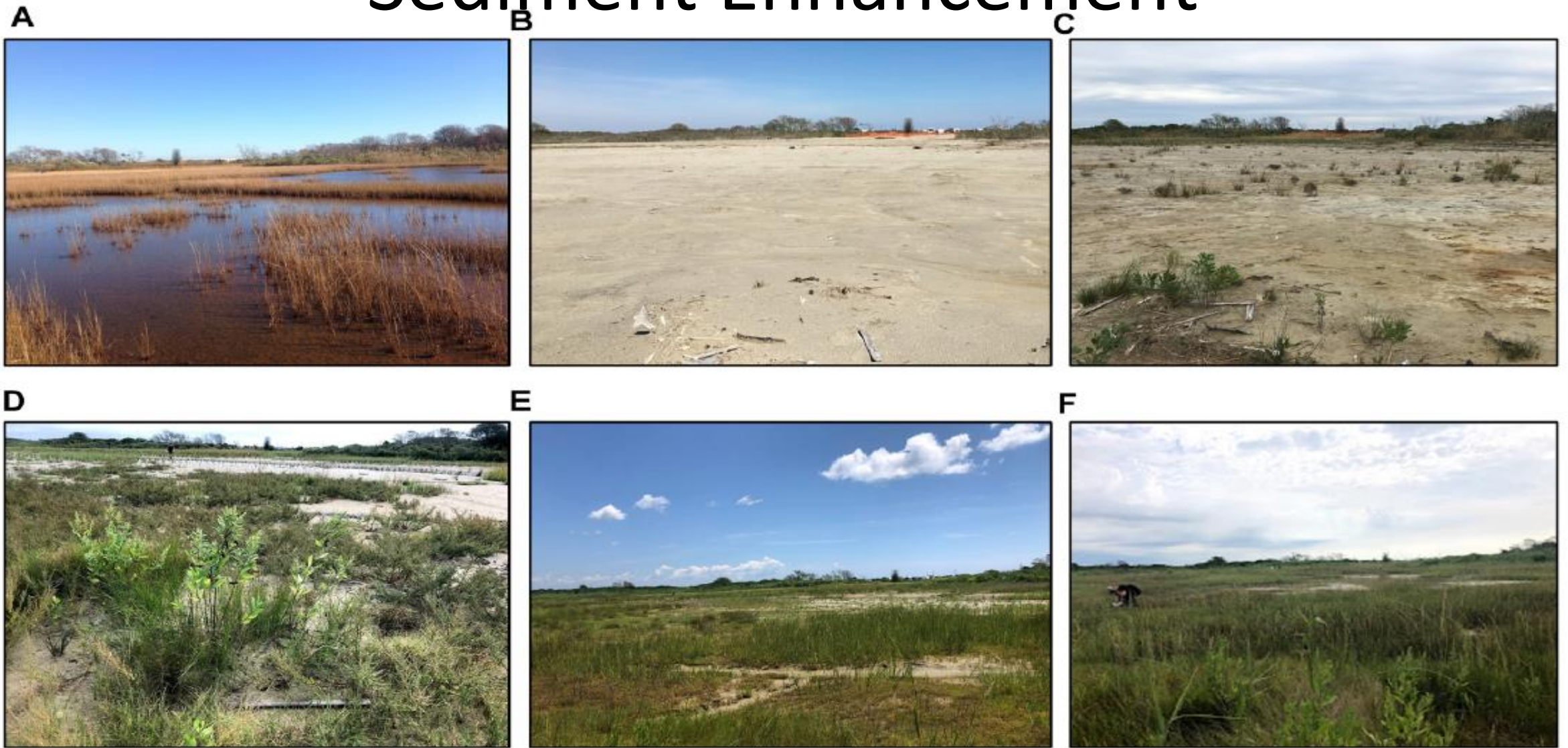


FIGURE 2

Time series photographs of the Ninigret sediment placement marsh. Initial conditions (A), immediately after sediment placement (B), first growing season after sediment placement (C), and second (D), third (E) and fourth (F) growing seasons (2018–2020).

Questions?

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