

Ecosystem Monitoring Program: Habitat Structure

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Overview

- ▶ Review of Spatial Analysis (status) – 41 marsh sites
- ▶ Temporal Analysis – 4 sites; 2005 – 2011
- ▶ Preliminary 2012 results



Overview Tidal Wetland Habitat Structure

- ▶ Sediment
 - Grain size and TOC
 - Accretion rates
- ▶ Hydrology
- ▶ Inundation
- ▶ Channels
- ▶ Vegetation
 - Elevation
 - Distribution patterns



Spatial Analysis

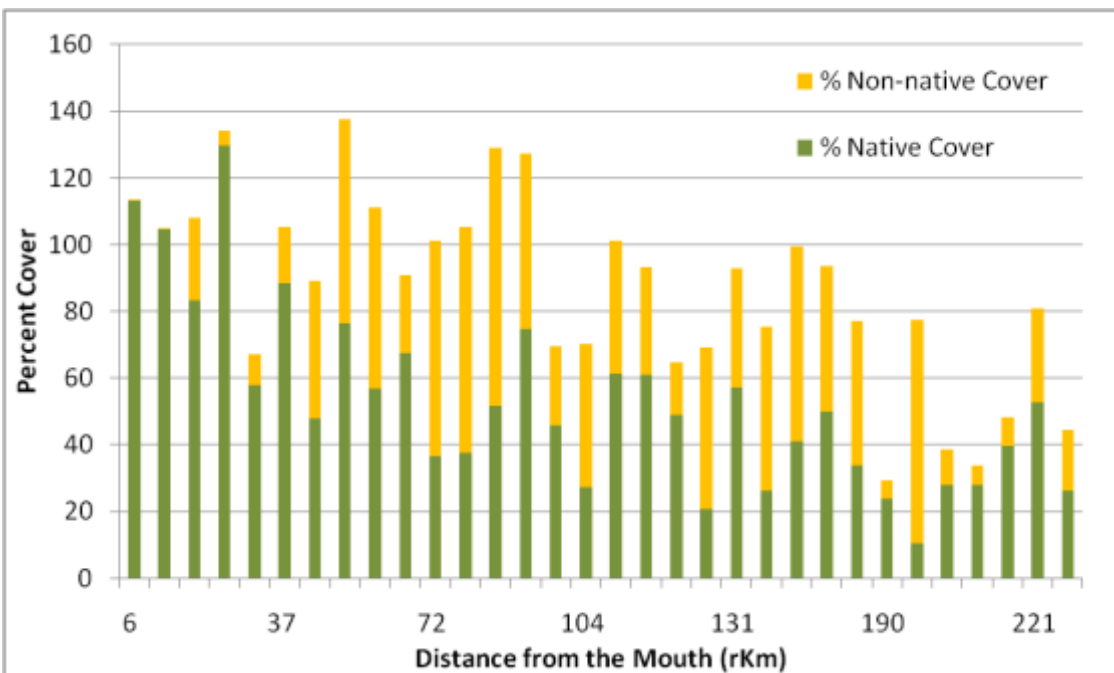
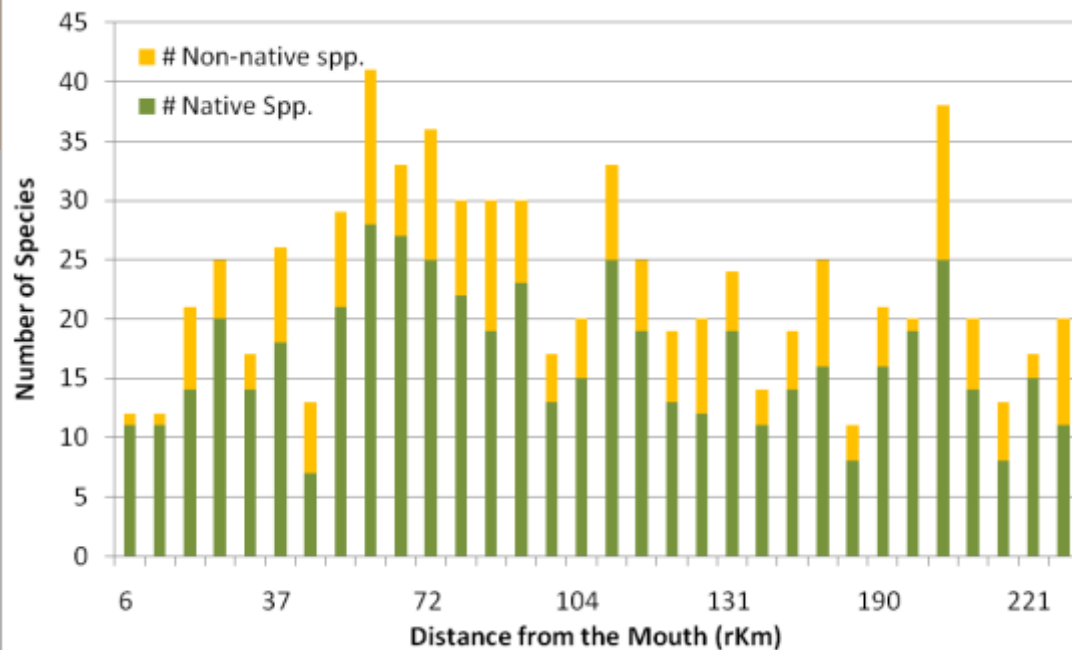


Overview of Marsh Vegetation Sampling

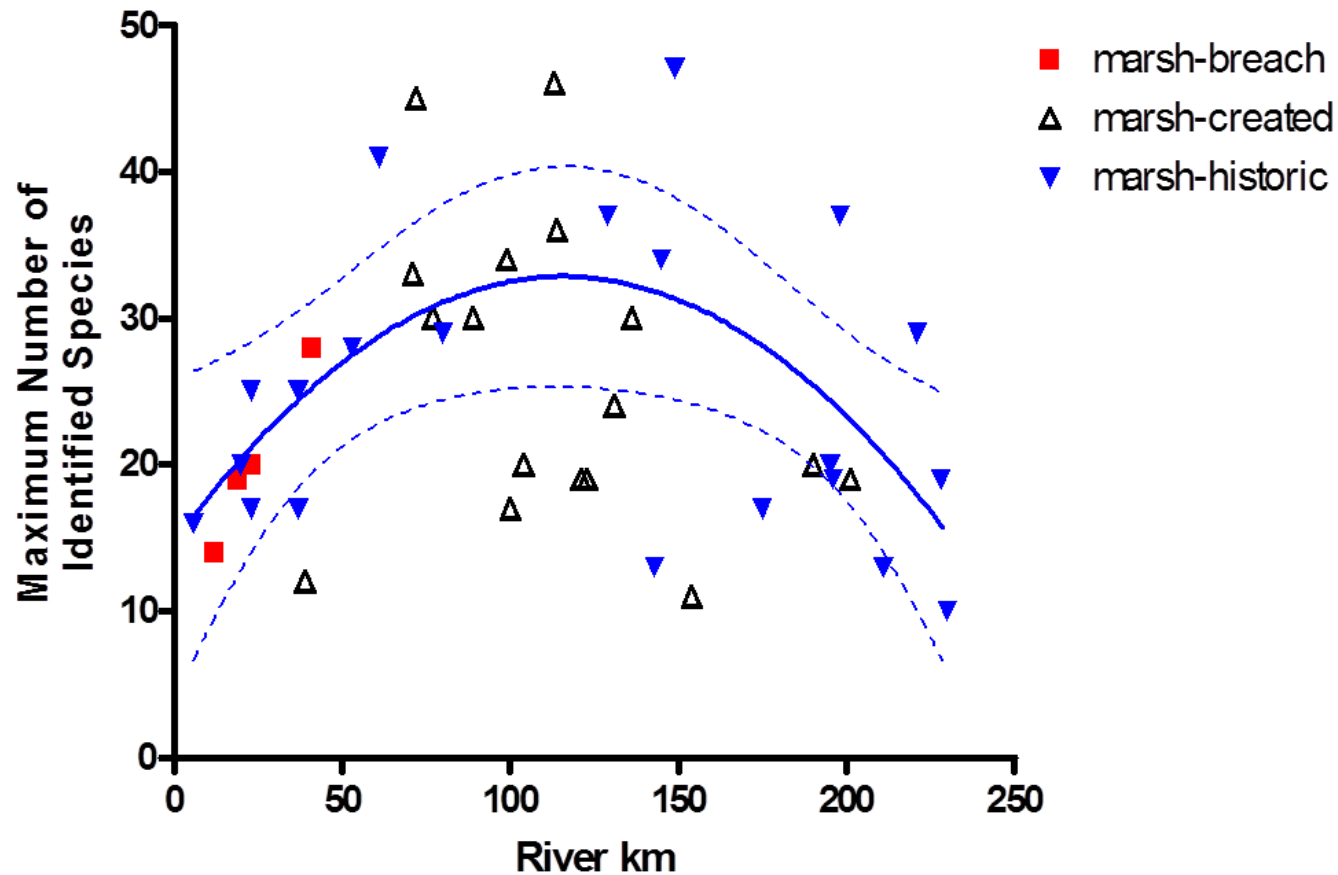
- ▶ 41 marsh sites
- ▶ 2784 quadrats sampled
- ▶ Reed canary grass occurred in 52% of the quadrats
- ▶ 172 taxa observed
- ▶ 7 taxa made up 68% of the cumulative cover



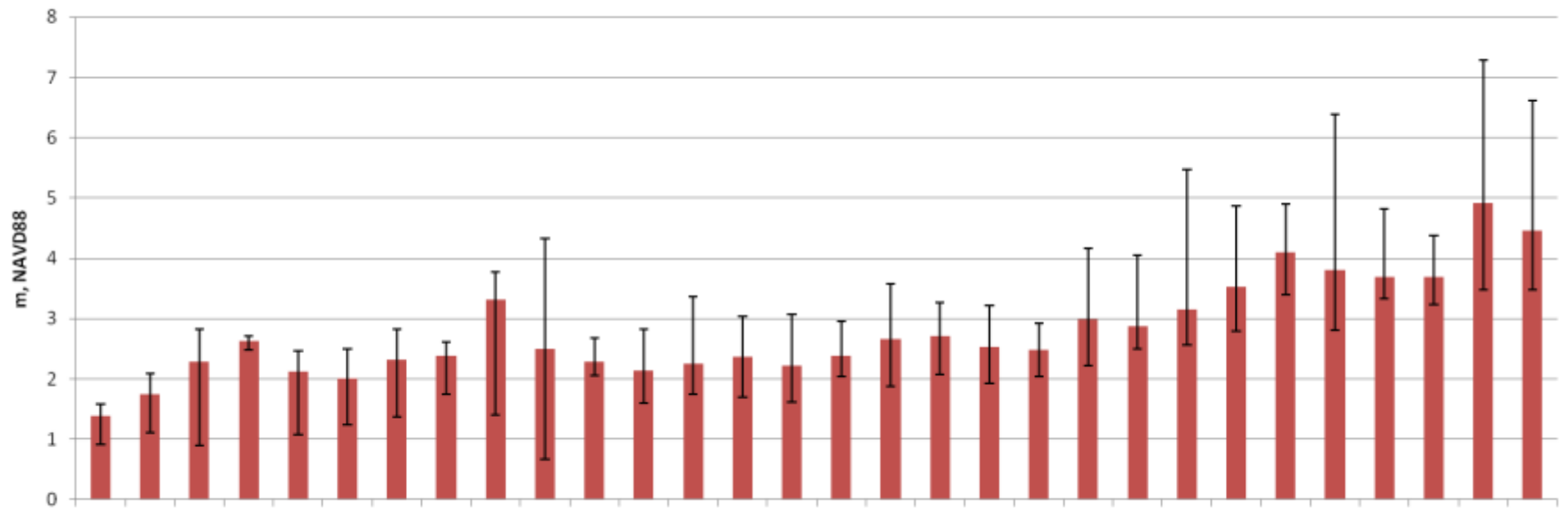
Common Name	Species Code	Percent Cover	Cumulative Cover
Reed canary-grass	PHAR	28%	28%
Common spikerush	ELPA	21%	49%
Wapato	SALA	10%	59%
Lyngby sedge	CALY	3%	62%
Canada waterweed	ELCA	2%	64%
False loosestrife	LUPA	2%	66%
Slough sedge	CAOB	2%	68%



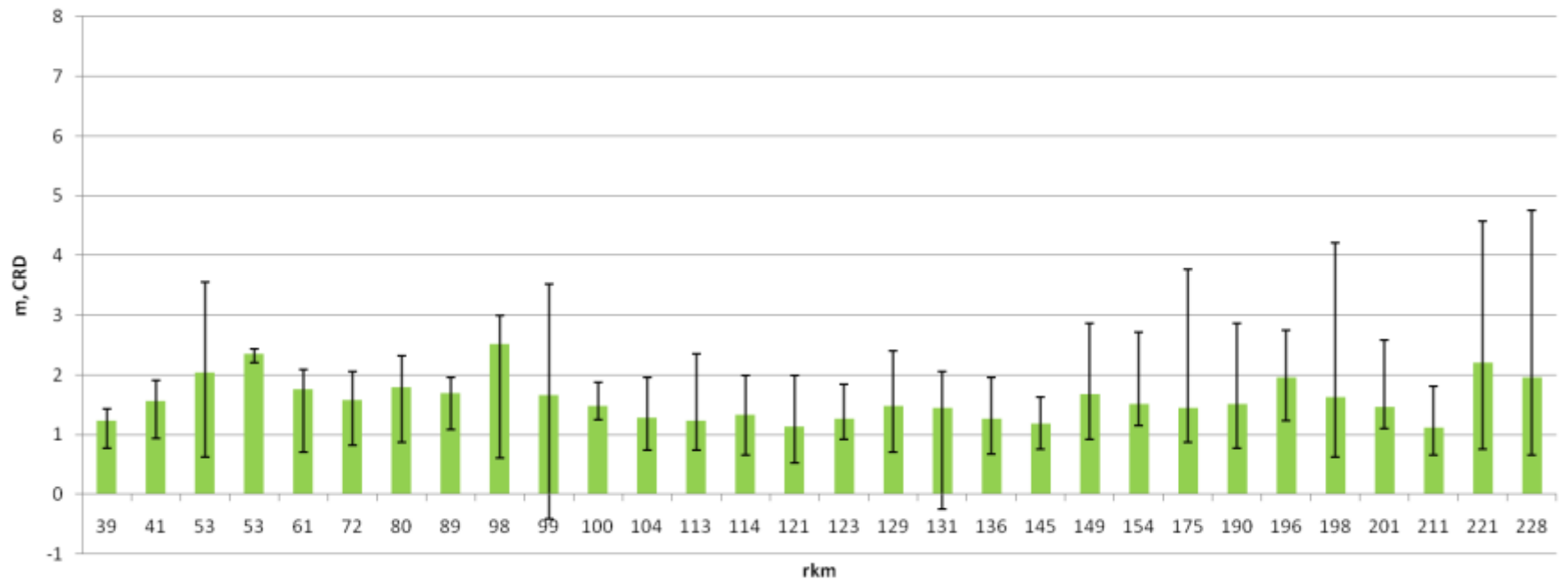
Plant Species Diversity



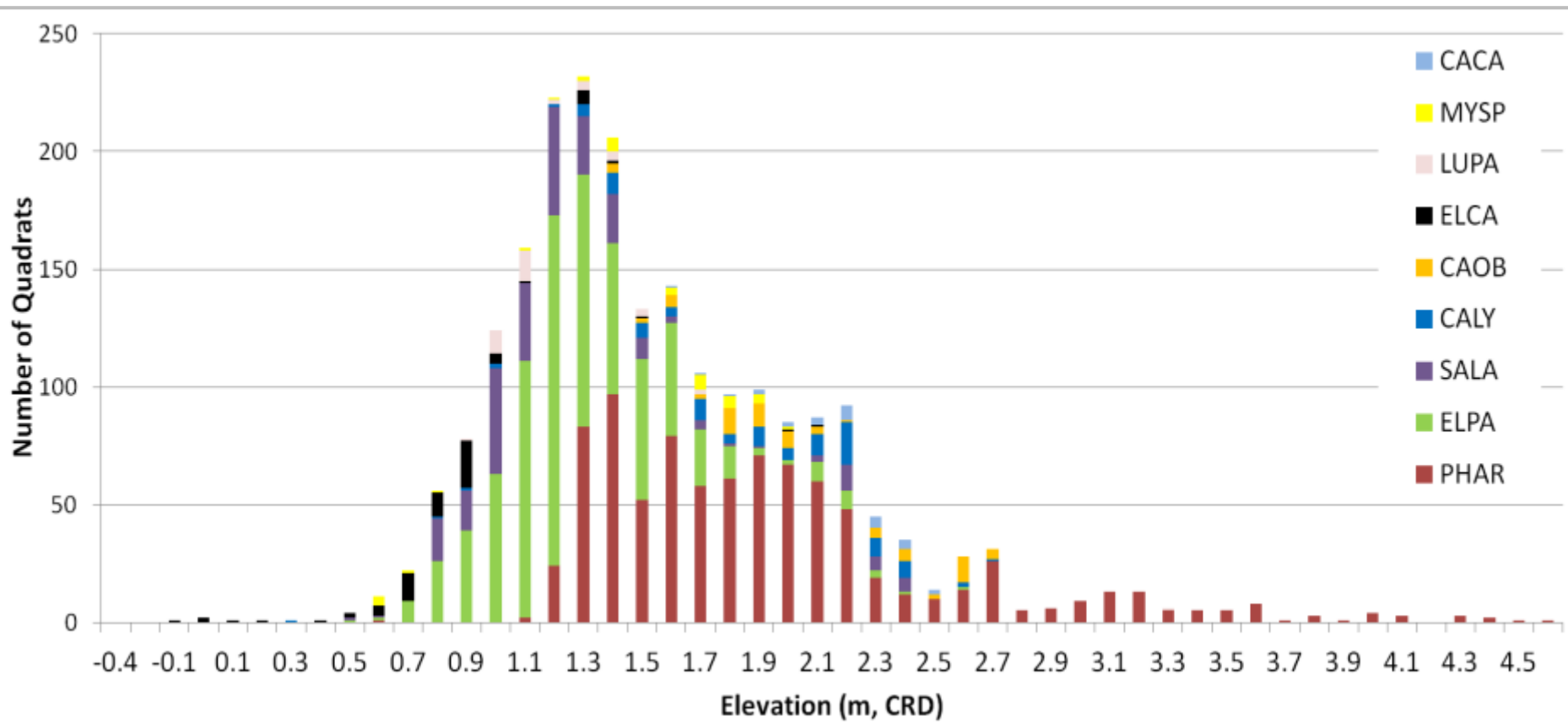
Avg site elevation (m, NAVD88)



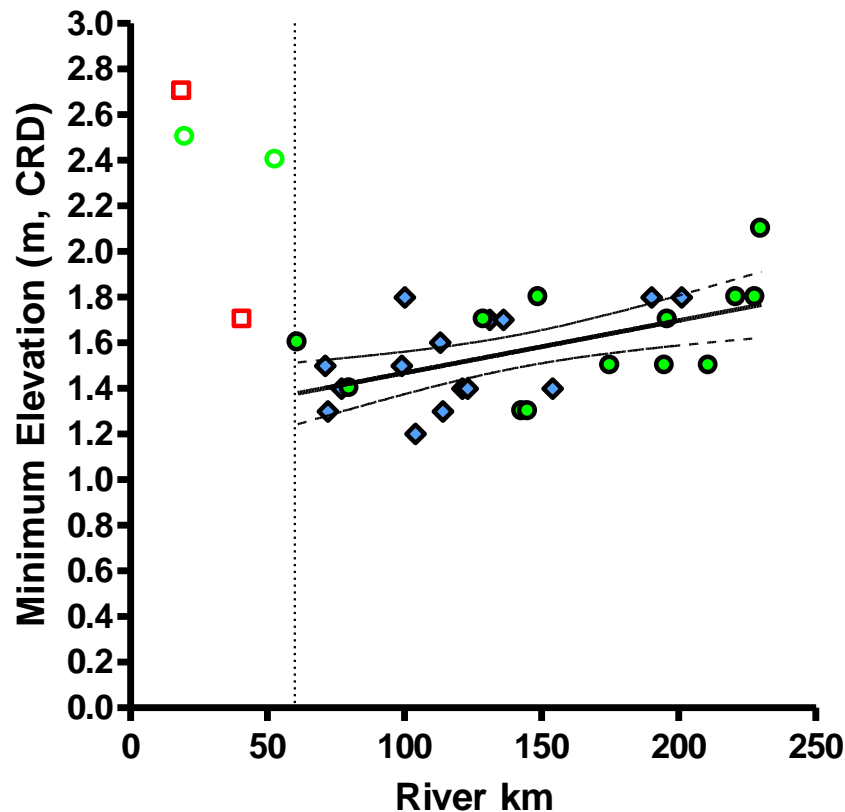
Avg site elevation (m, CRD)



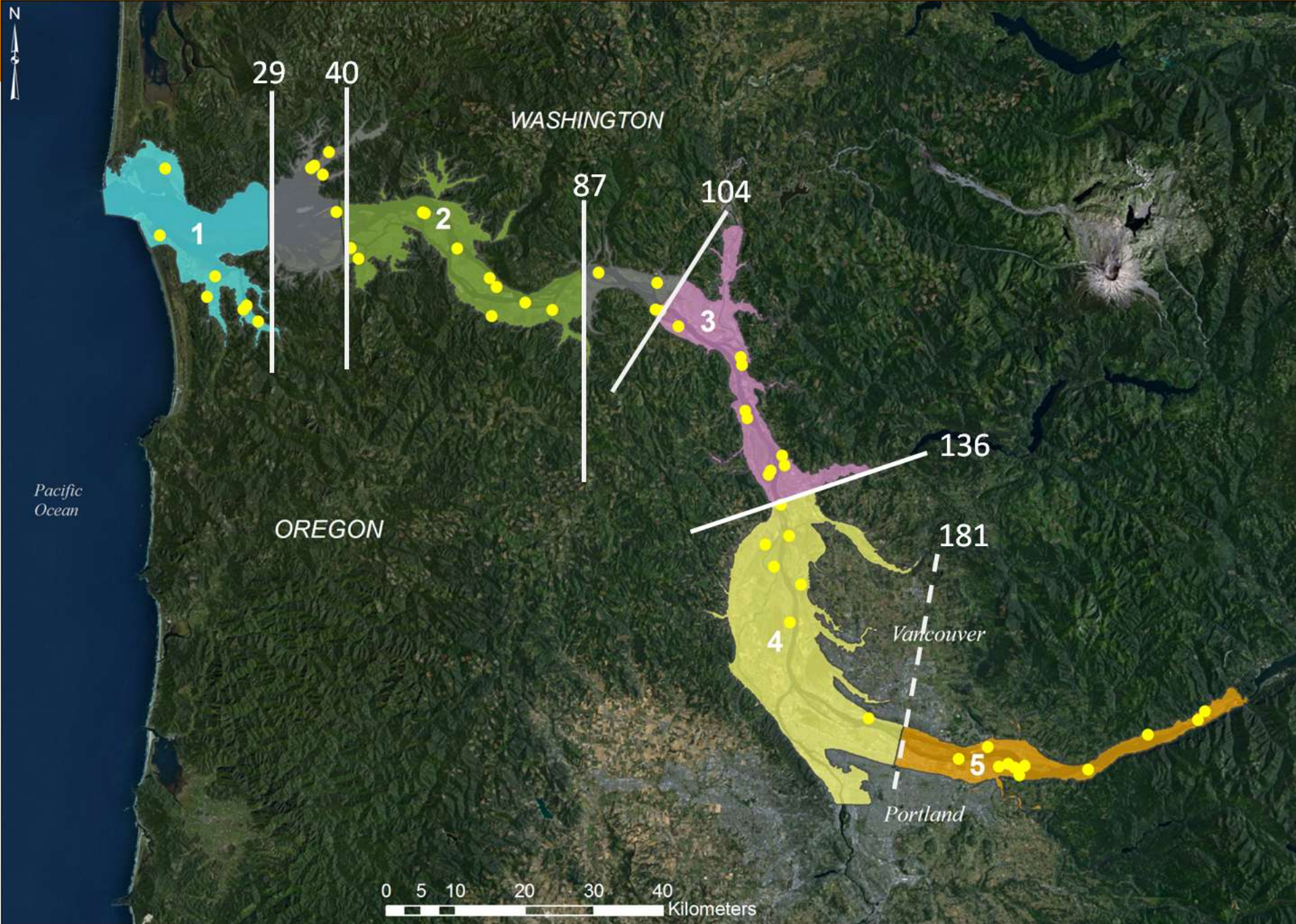
Elevation of Dominant Vegetation Species



Elevation of Reed Canary-Grass

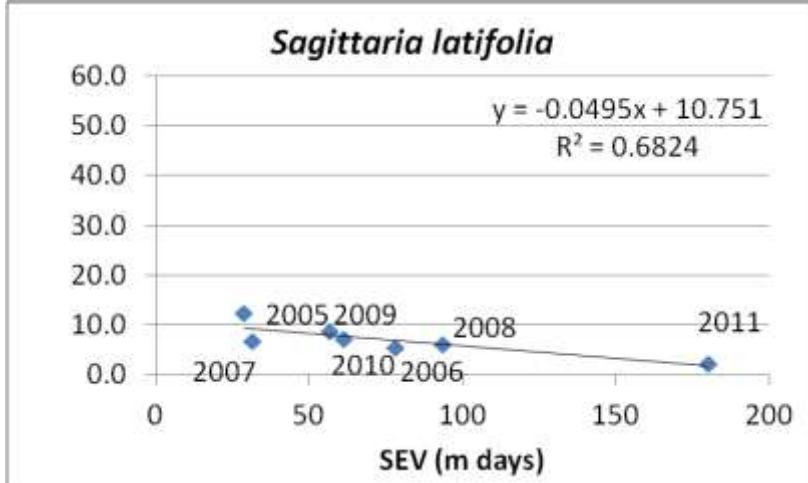
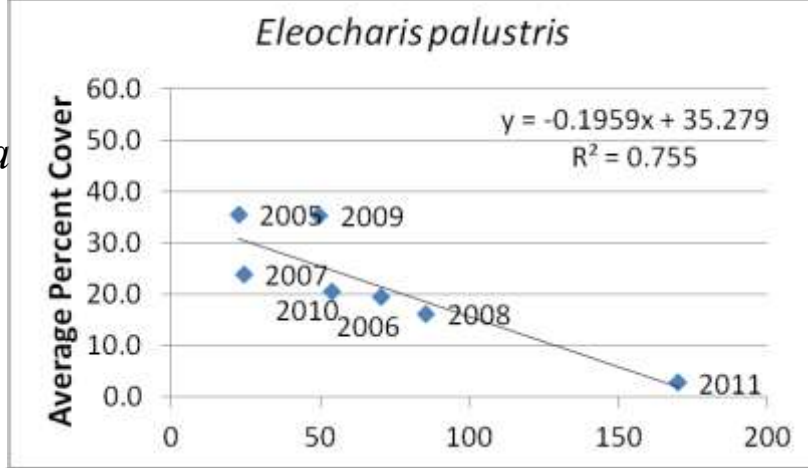
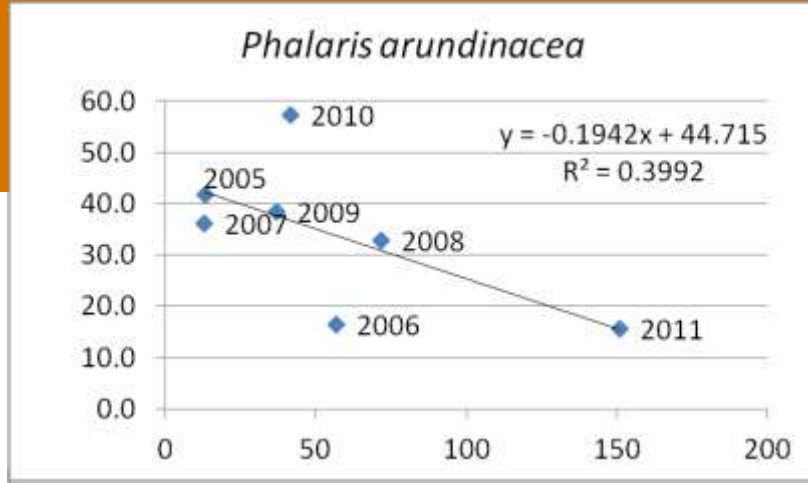
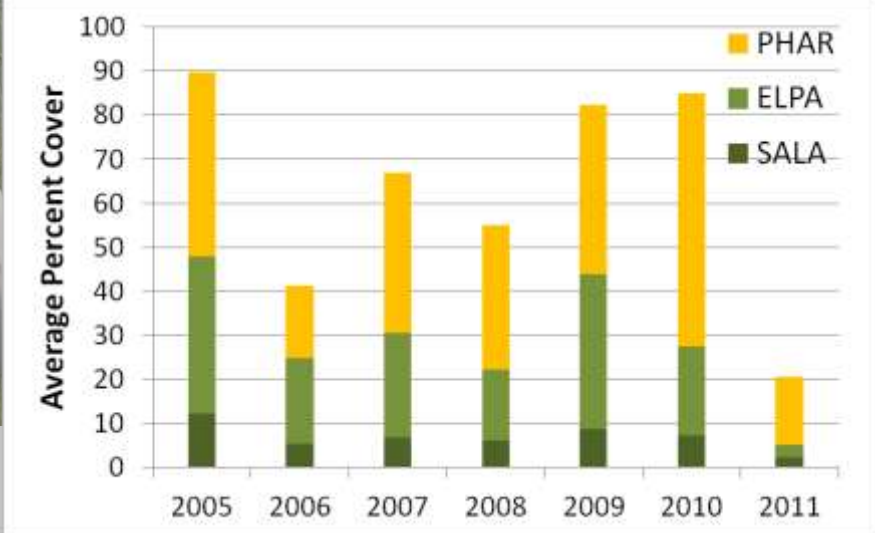
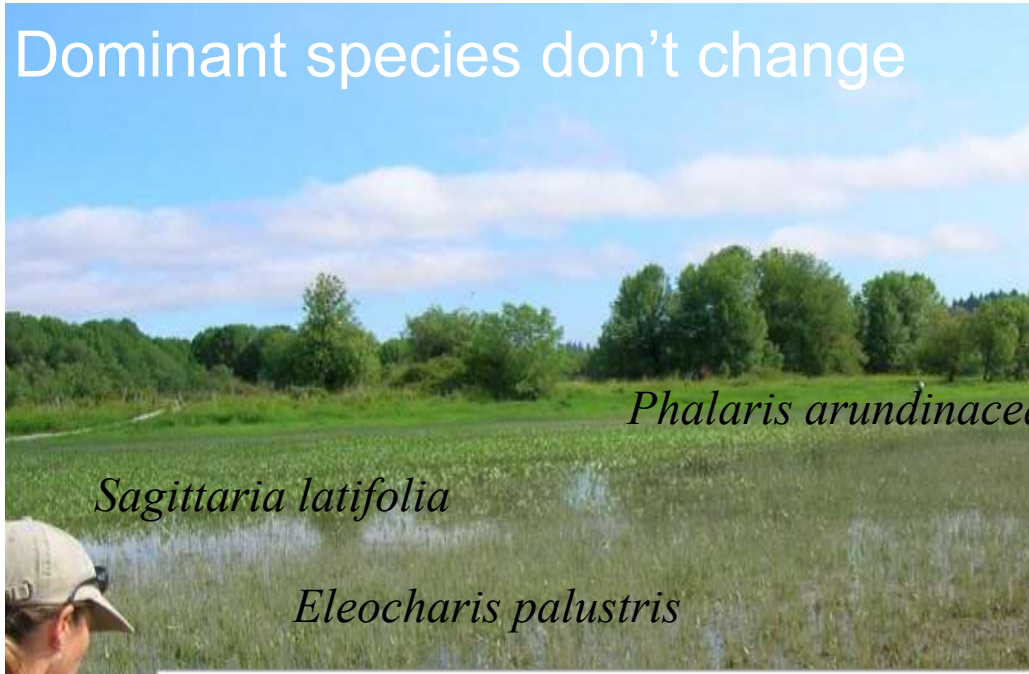


- ▶ Average minimum elevation 1.4 to 1.7 m, CRD
- ▶ Below 1.5 m, CRD
 - Spike rush (*Eleocharis palustris*)
 - Wapato (*Sagittaria latifolia*)

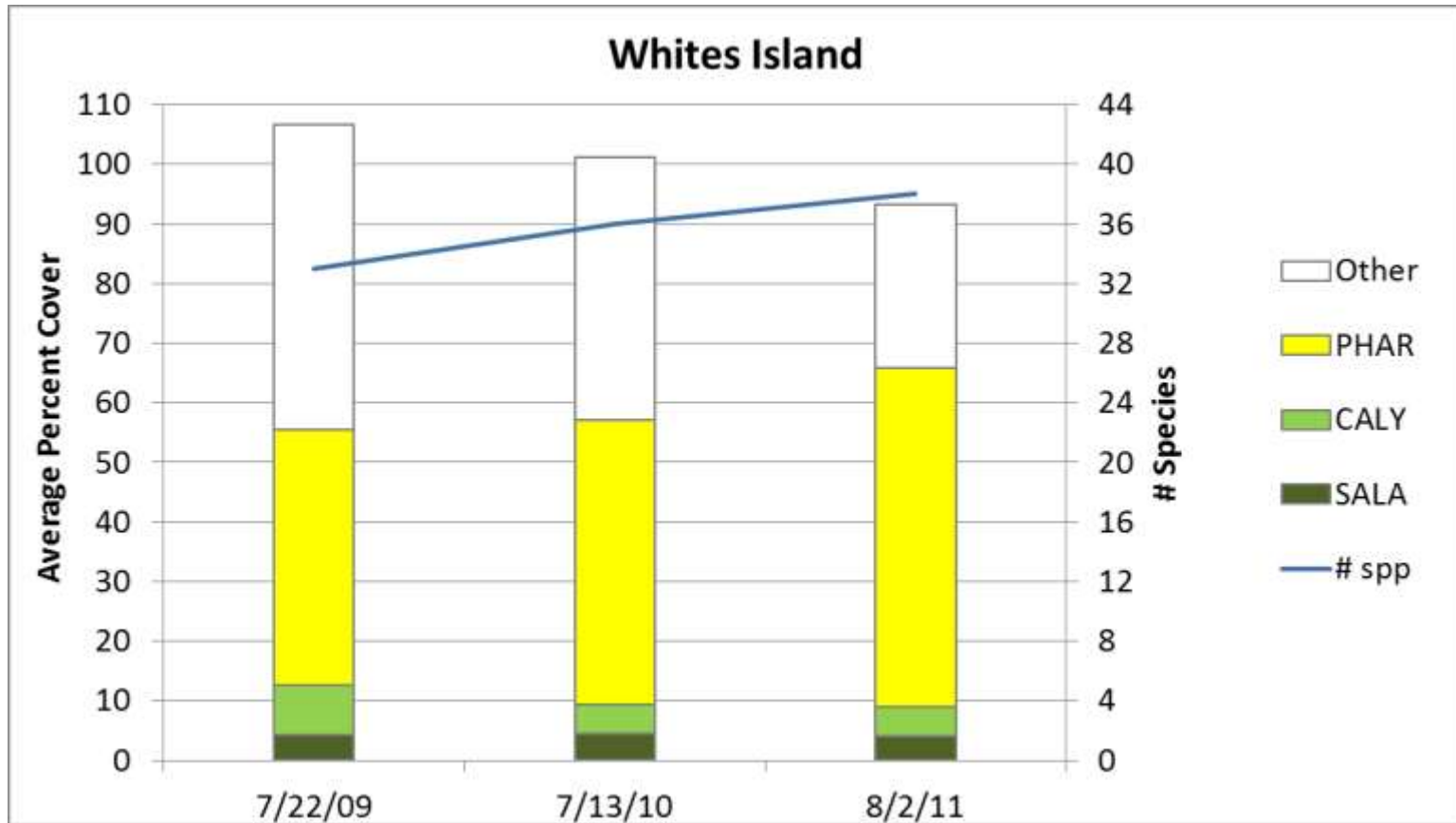


Temporal Analysis

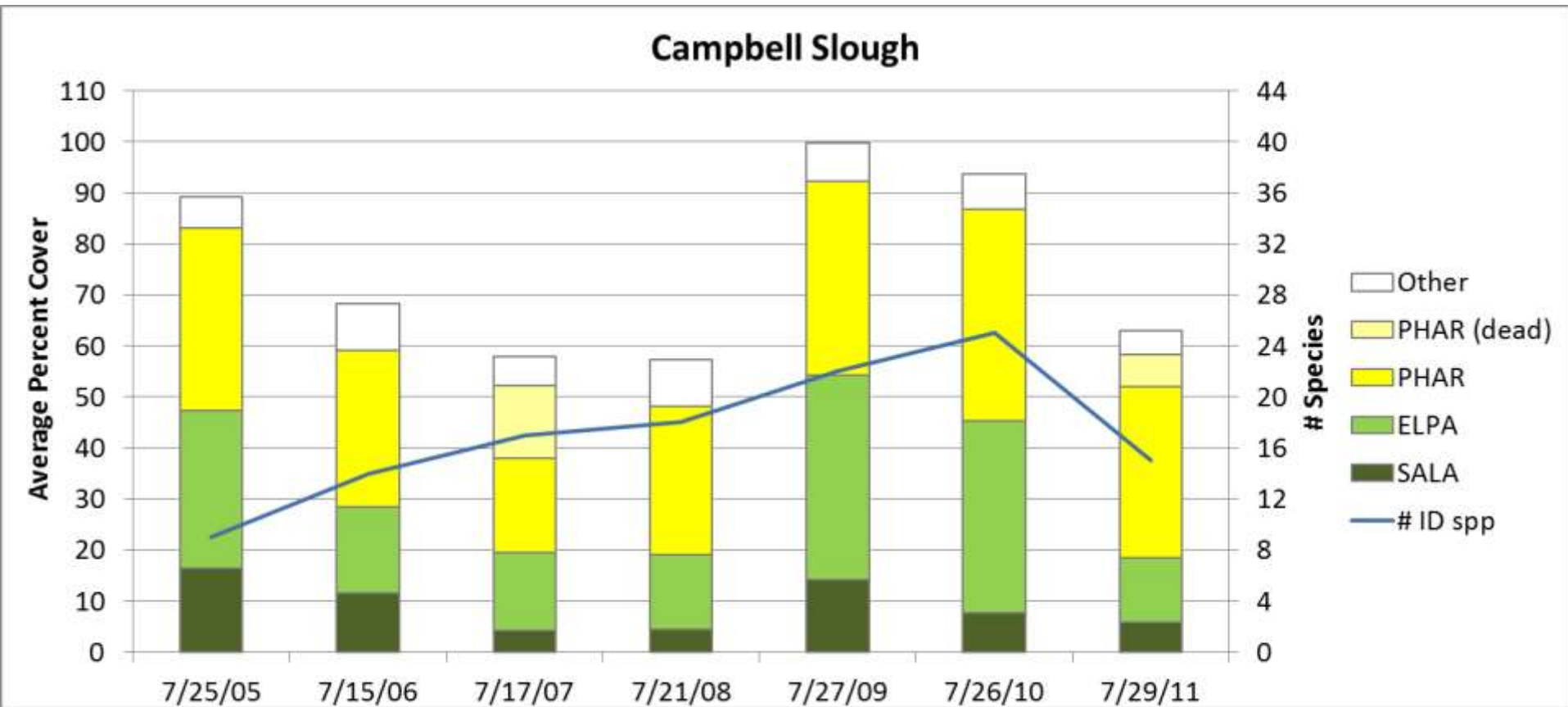
Dominant species don't change



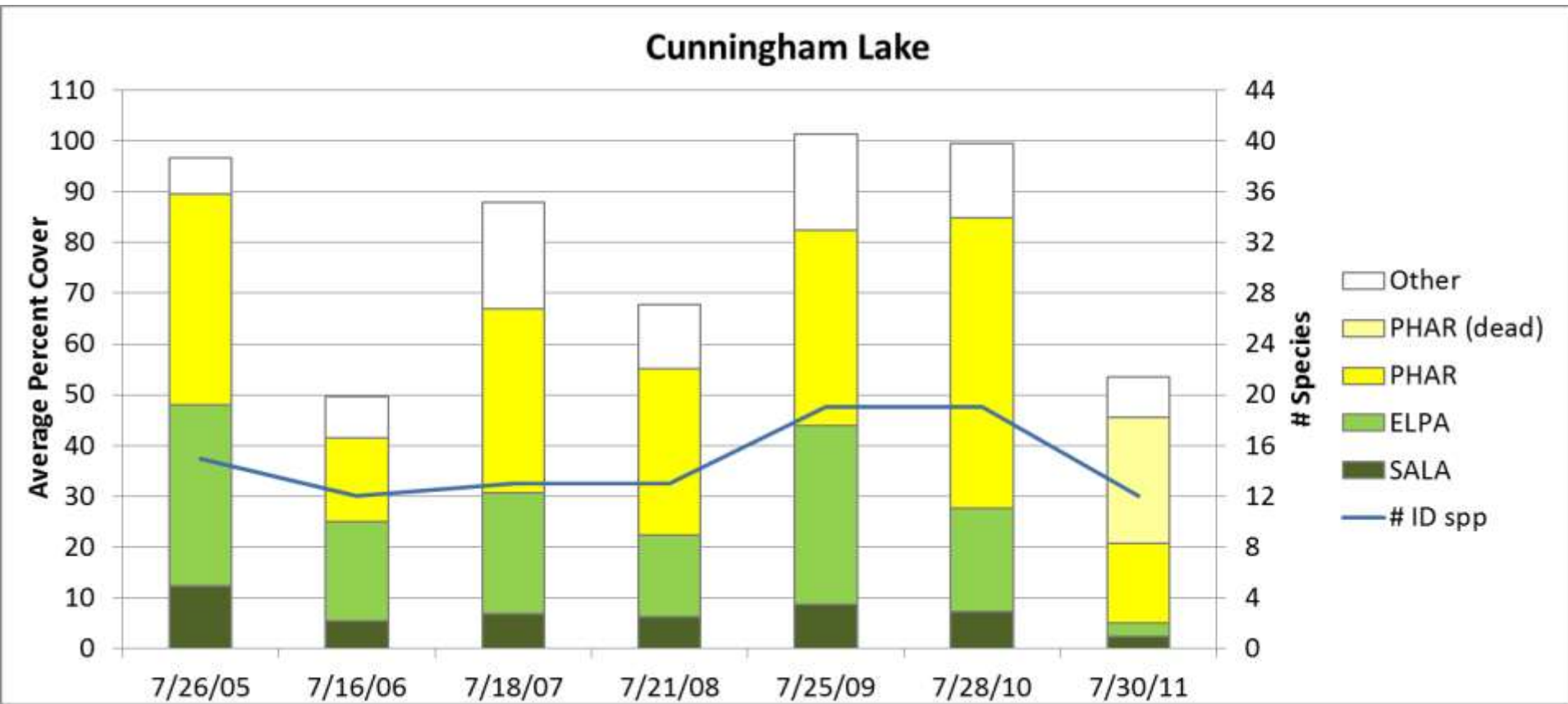
Temporal Analysis



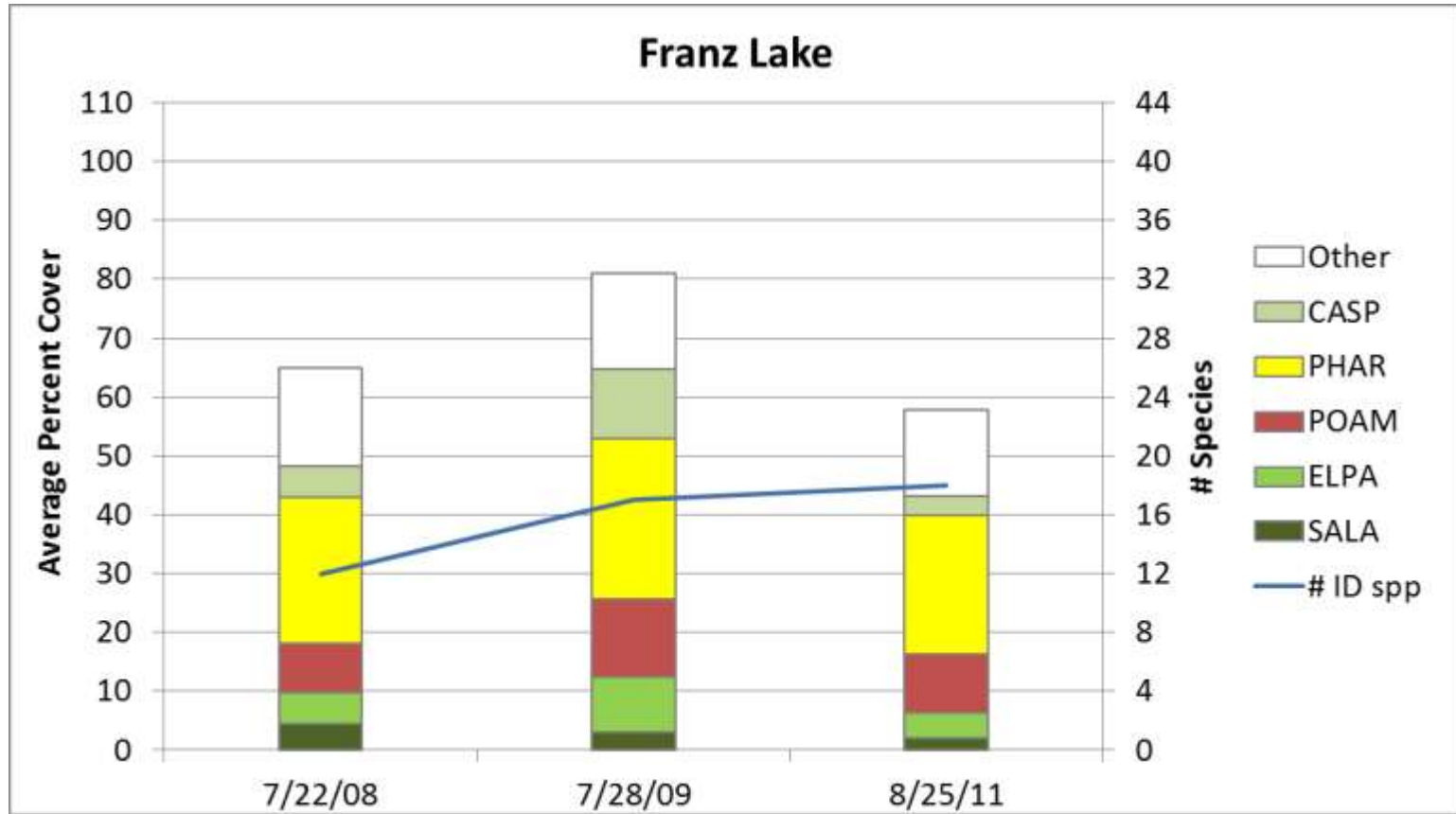
Temporal Analysis



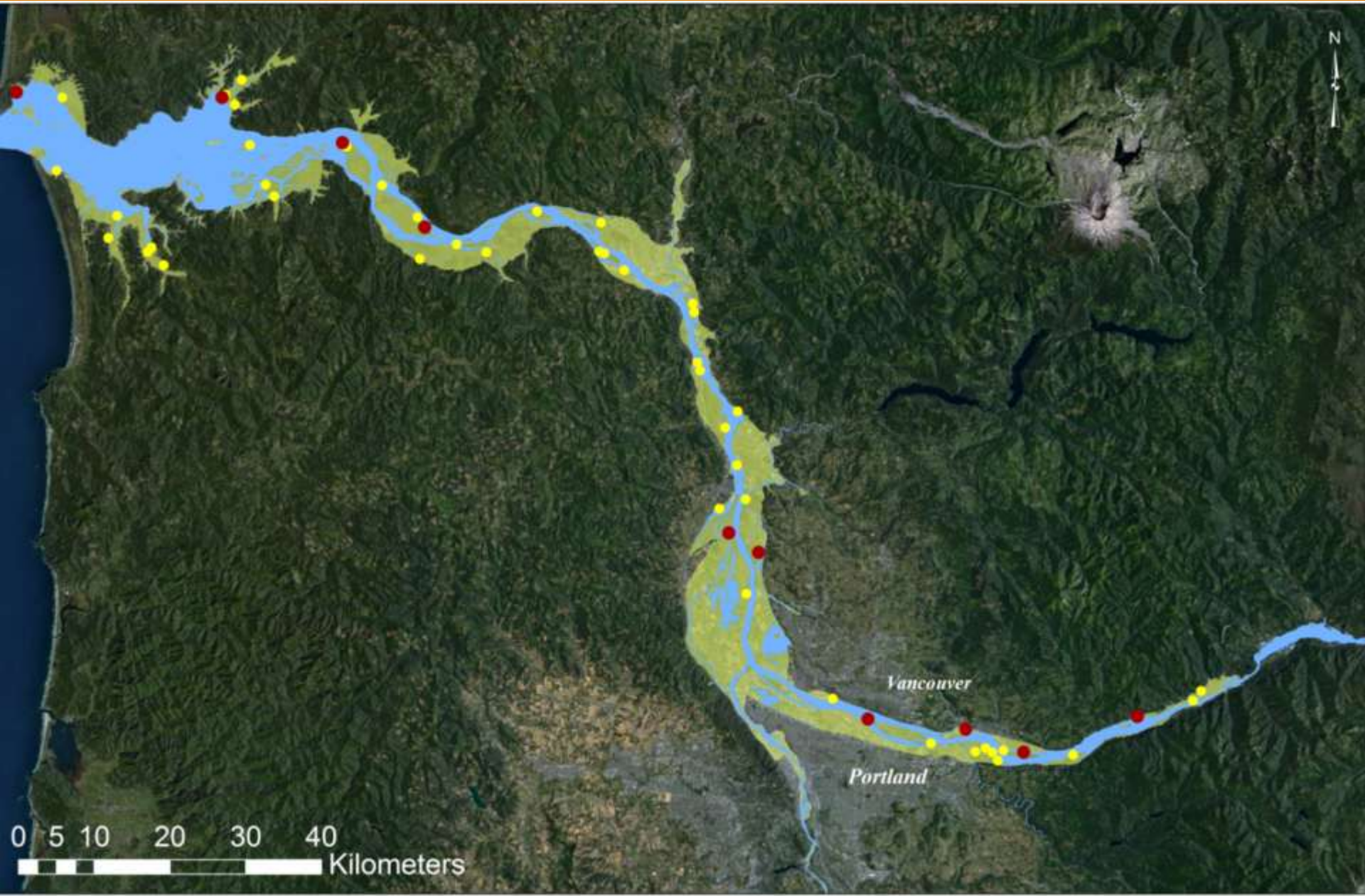
Temporal Analysis



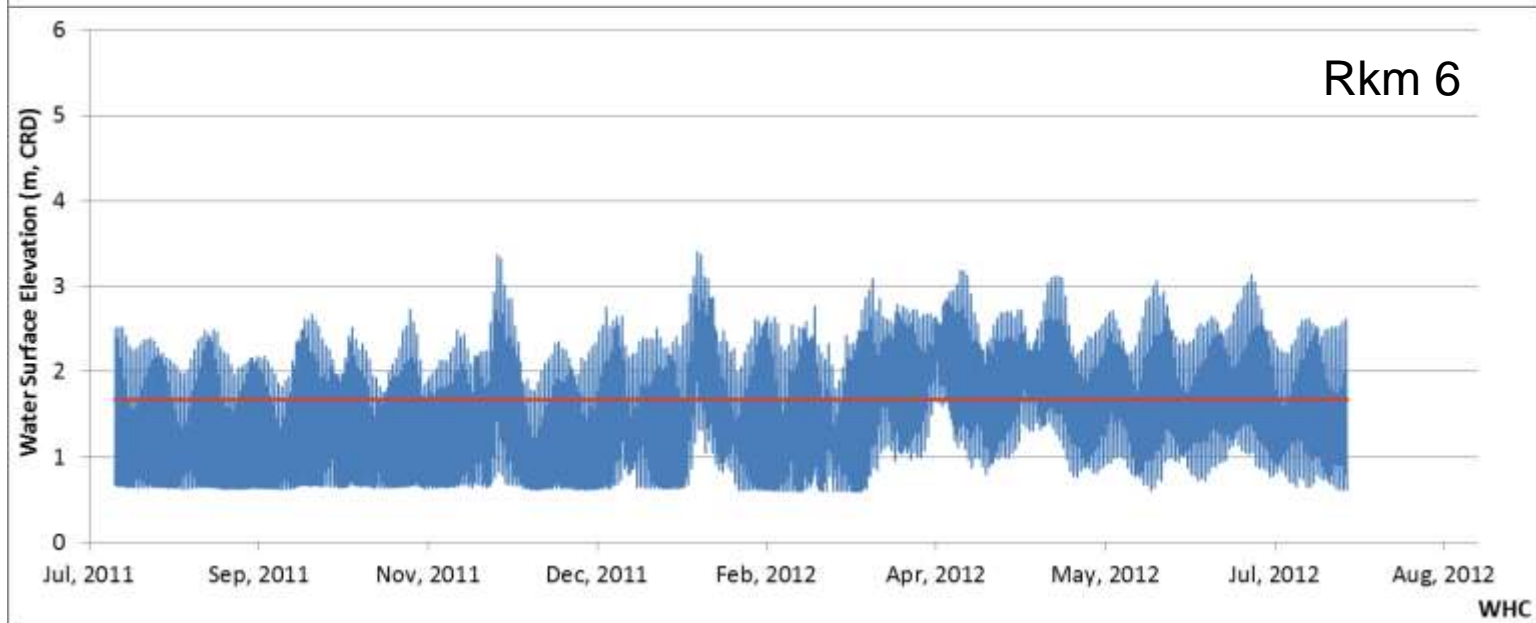
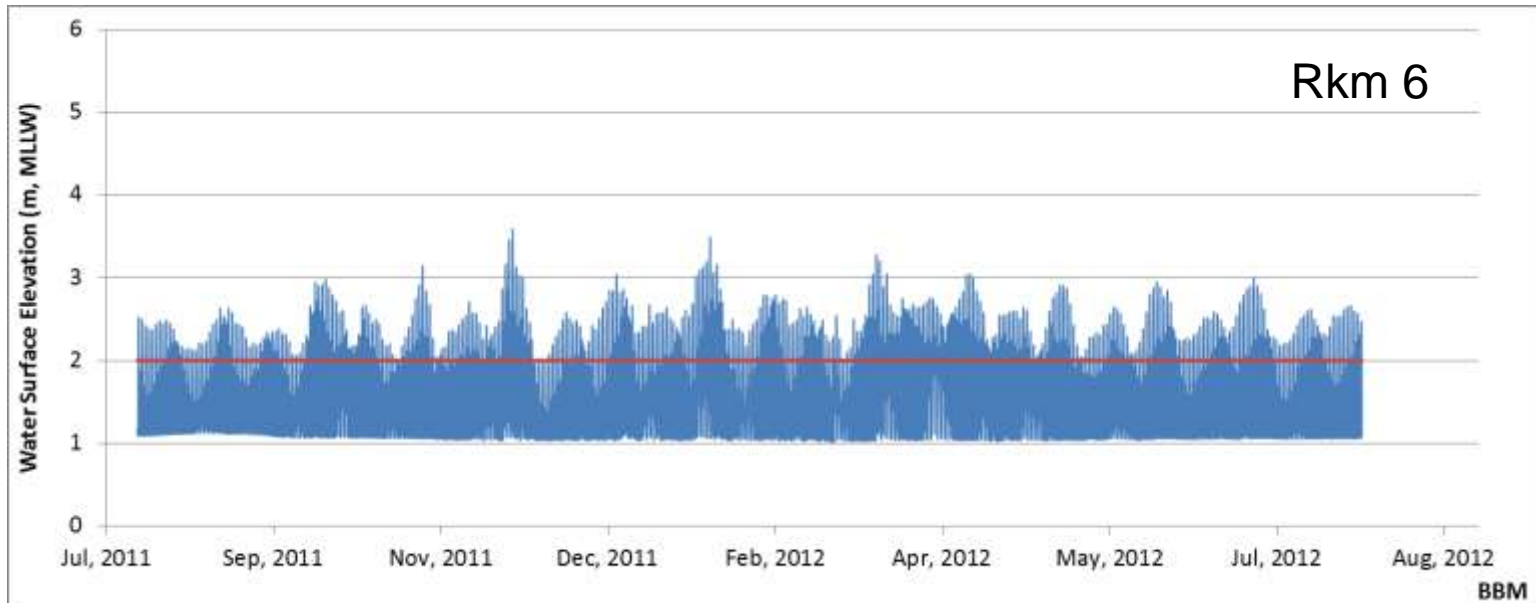
Temporal Analysis



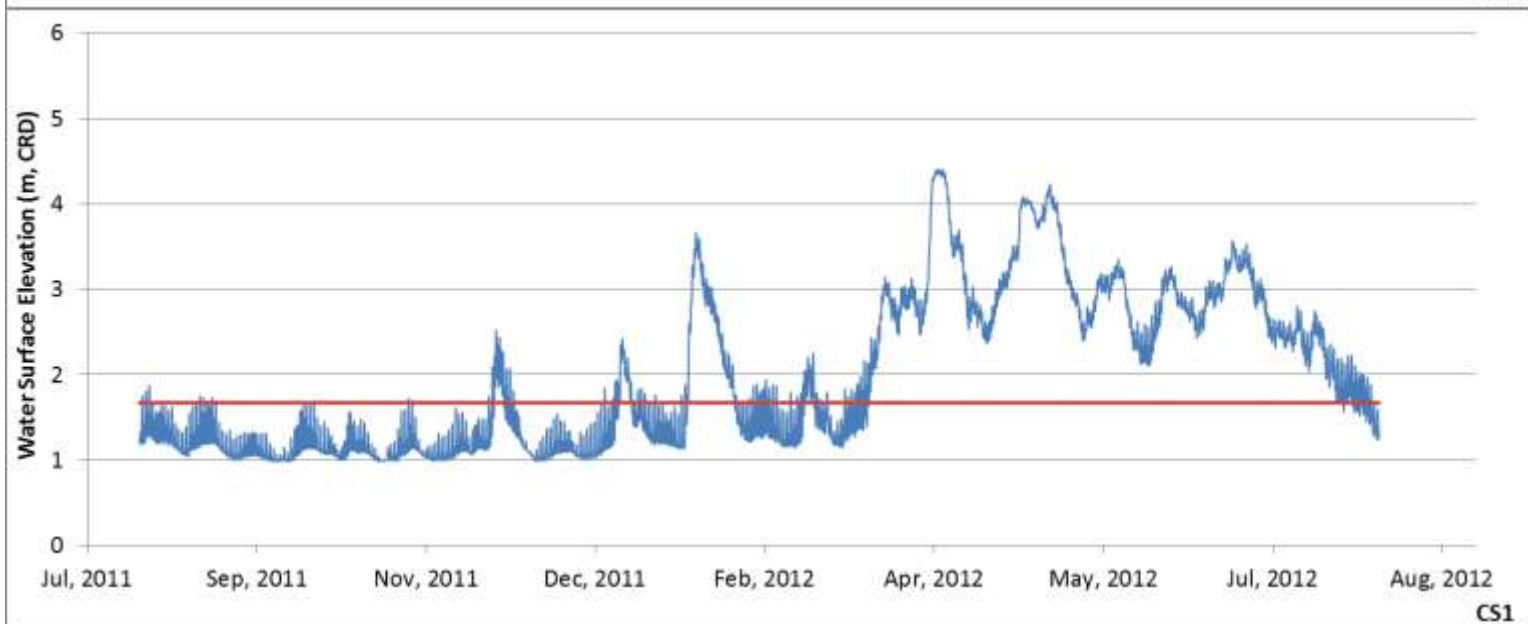
2012 Preliminary Results



2012 Preliminary Results



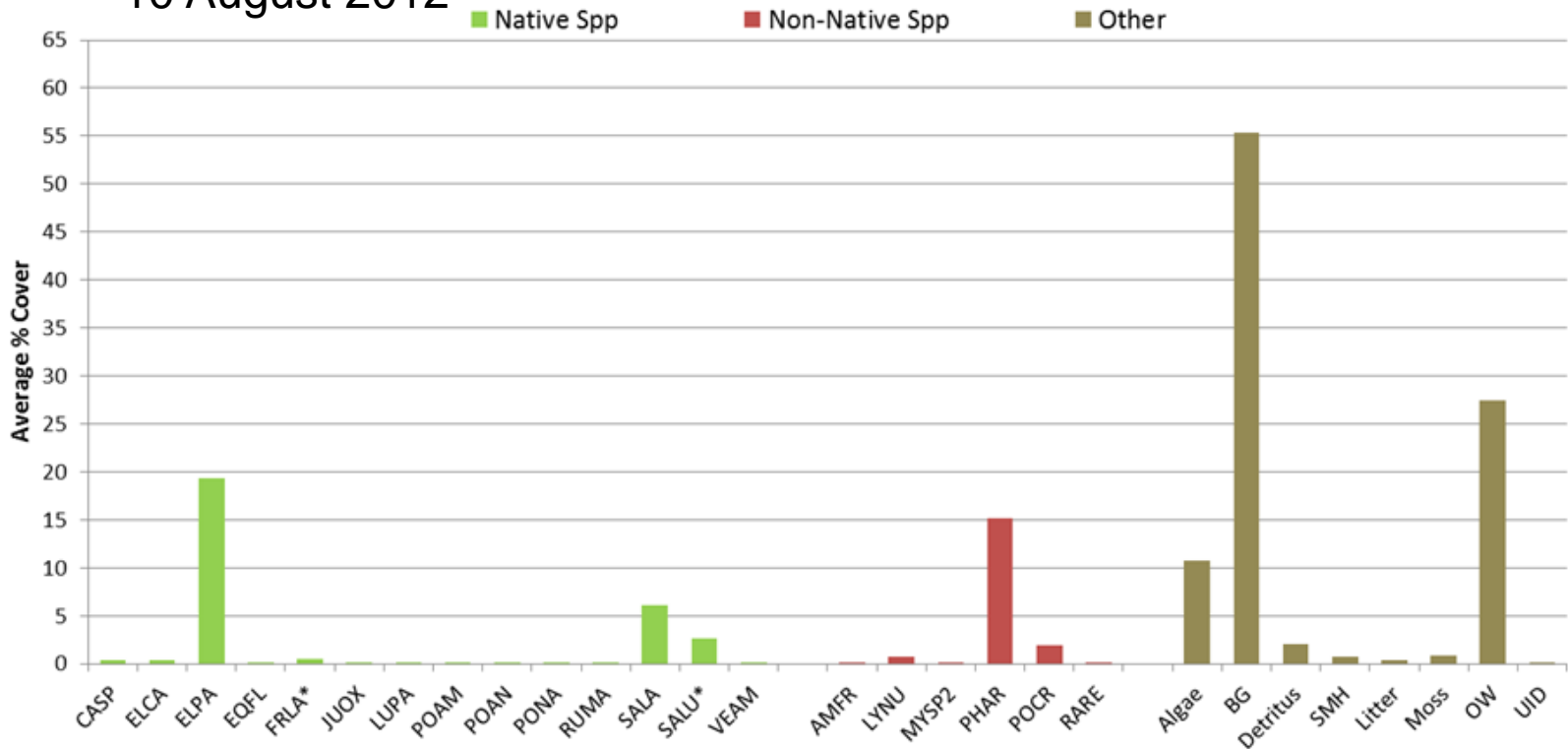
2012 Preliminary Results



2012 Preliminary Results

21 July 2012

10 August 2012



Campbell Slough, 2012

EST
RATORY

2012 Preliminary Results

Franz Lake

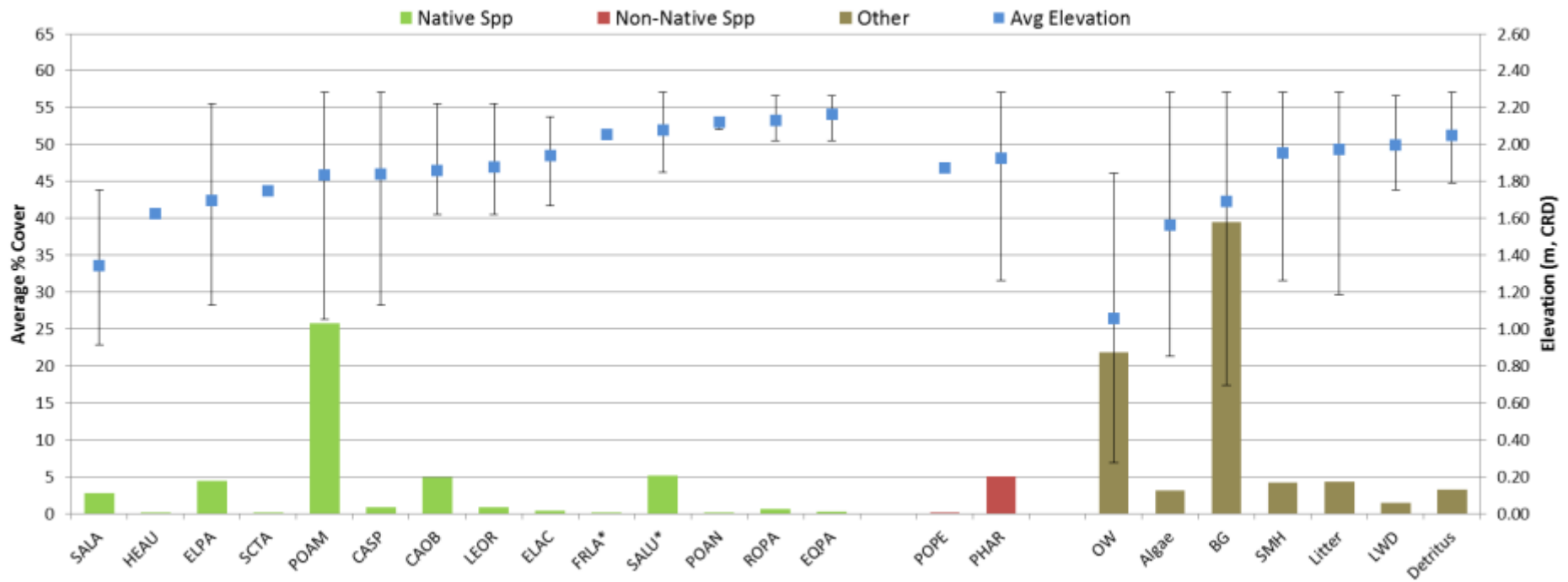


21 July 2012



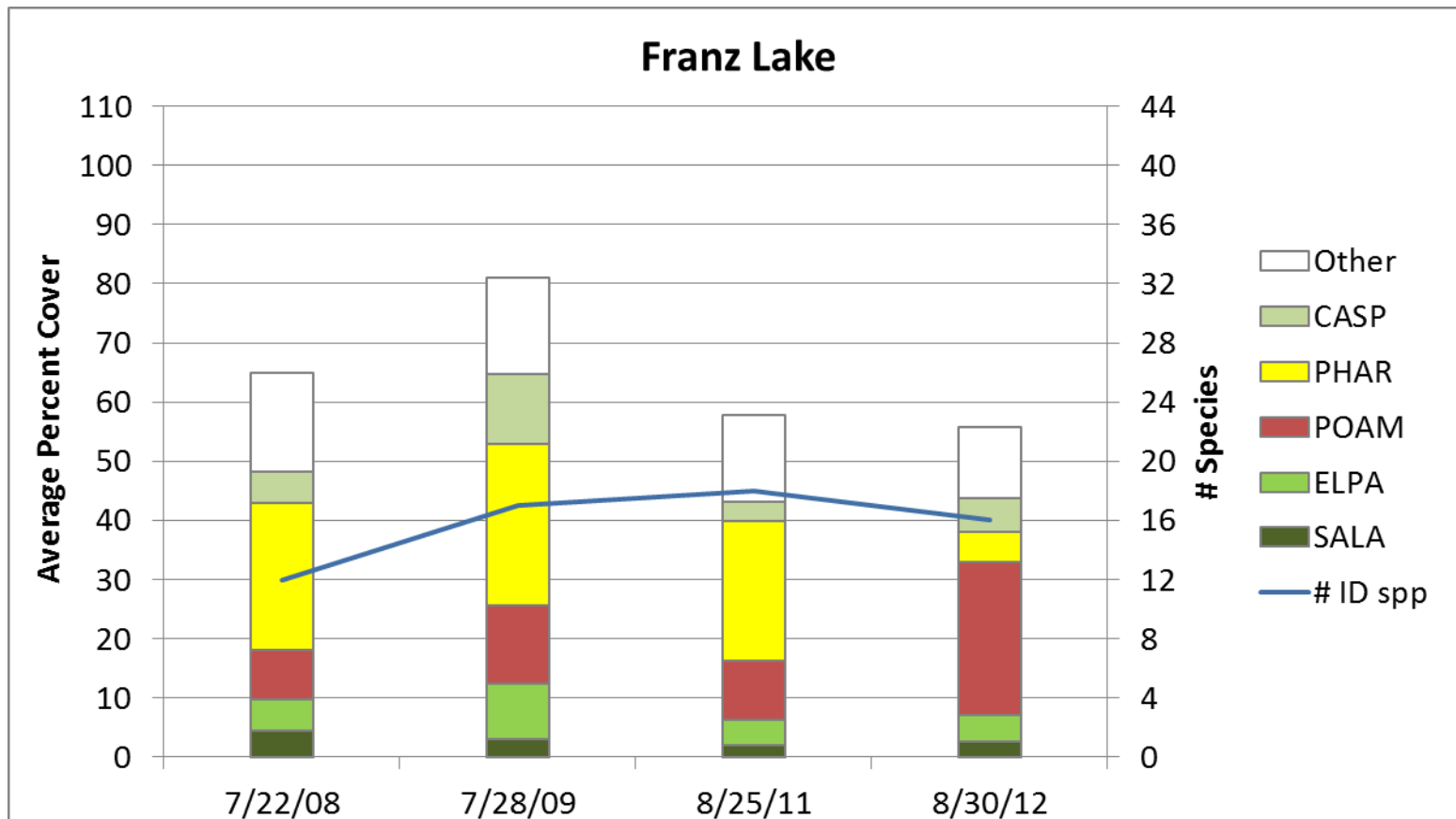
30 August 2012

2012 Preliminary Results



Franz Lake, 2012

2012 Preliminary Results



2011 Biomass Results

Vegetation Biomass

Site	2011 Summer Vegetation Strata	Summer Average (Dry Wt., g/m ²)	2011 Winter Average (Dry Wt., g/m ²)	Export Potential (Dry Wt., g/m ²)
Baker Bay (BBM)	Emergent	857.2	336.7	521
	Submerged	81.8	0.0	82
Whites Island (WHC)	Emergent	886.1	325.3	561
	Submerged	49.3	0.0	49
Campbell Slough (CS1)	Emergent	327.3	52.0	275
	Submerged	0.4	0.0	1
Franz Lake (FLM)	Emergent*	203.2	234.9	NA
	Submerged	ND	ND	ND

2011 Biomass Results

Vegetation Biomass Collection Changes

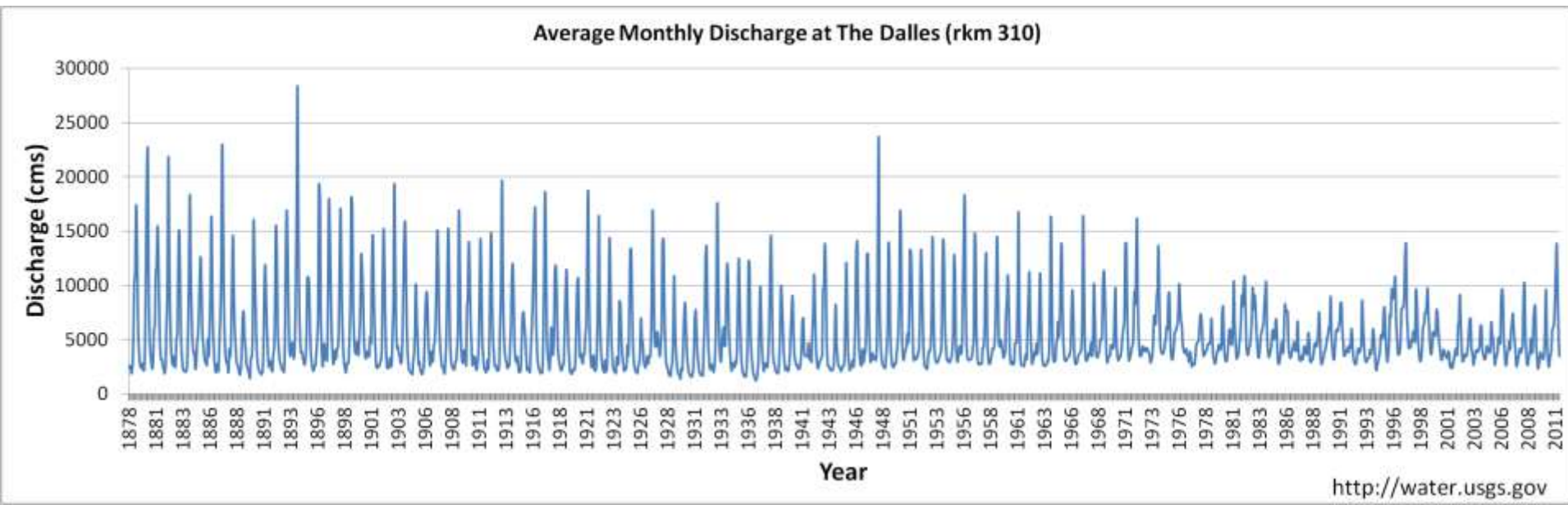
- ▶ Vegetation biomass collection in 2012 at 6 sites
- ▶ Stratified by vegetation community (e.g. high marsh, low marsh) where appropriate
- ▶ Altered timing of up-river sampling to try to capture “peak” summer biomass.
- ▶ Need more up-river sites (above Whites Island)

Key Findings

- ▶ Elevations of emergent wetlands cover a very narrow elevation range within the estuary.
- ▶ Reed canary grass has an average lower elevation above 60 rkm from ranging 1.4 to 1.7 m, CRD.
- ▶ Inundation varies throughout the estuary and is an important driver for vegetation elevation and community assemblages.
- ▶ Cover and biomass changes in response to inundation.
- ▶ Currently, vegetation in reference wetlands is stable and resilient to some variation in water level.
- ▶ Vegetation community change occurs with changes in the hydrologic patterns.
- ▶ These data inform restoration planning.

Data Gaps for LCRE Wetlands

- ▶ How have the changes in flow, altered sediment processes, and other anthropogenic influences affected:
 - Wetland establishment
 - Succession
 - Inundation patterns
 - Vegetation
- ▶ How will climate change affect inundation patterns and vegetation?



Data Gaps for LCRE Wetlands

- ▶ How does vegetation biomass and the potential contribution to the food web change as a result of:
 - Vegetation type
 - Position in the LCRE
 - Inter-annual variability

