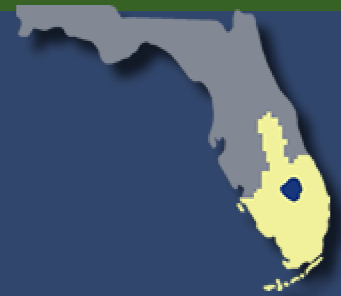


STA Vegetation Coverage Assessment

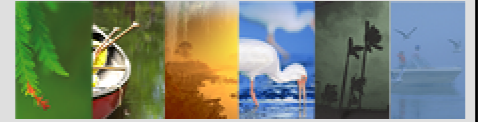
Quarterly Communications Meeting on the Long-Term Plan
for Achieving Water Quality Goals for the Everglades
Protection Area Tributary Basins
September 10, 2010

Delia Ivanoff and Hongjun Chen
(SFWMD)
Steve Colon (Critigen)





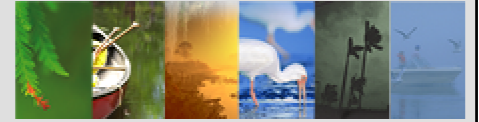
Requirements



- **2004 LTP revision:**
 - **Eliminated annual sampling of biomass and P content; replace with short-term monitoring in individual cells on as-needed basis.**
 - **Aerial imagery at 1:24,000 scale.**
- **EFA Permit:**
 - **Aerial vegetation photographs and mapping in accordance with the LTP.**



Methodology



- **Dates of Photography: 4/7/2007, 4/15-16/2008, and 4/16/2009**
- **Acquisition Methods:**
 - **2007 and 2008 aerial photography was collected as color infrared film at 1:12,000 scale.**
 - **2009 digital imagery was captured at 1 foot resolution using the Microsoft Vexcel UltraCamX digital sensor.**
- **“Groundtruthing” – helicopter flights to verify coverage of dominant species at random locations.**

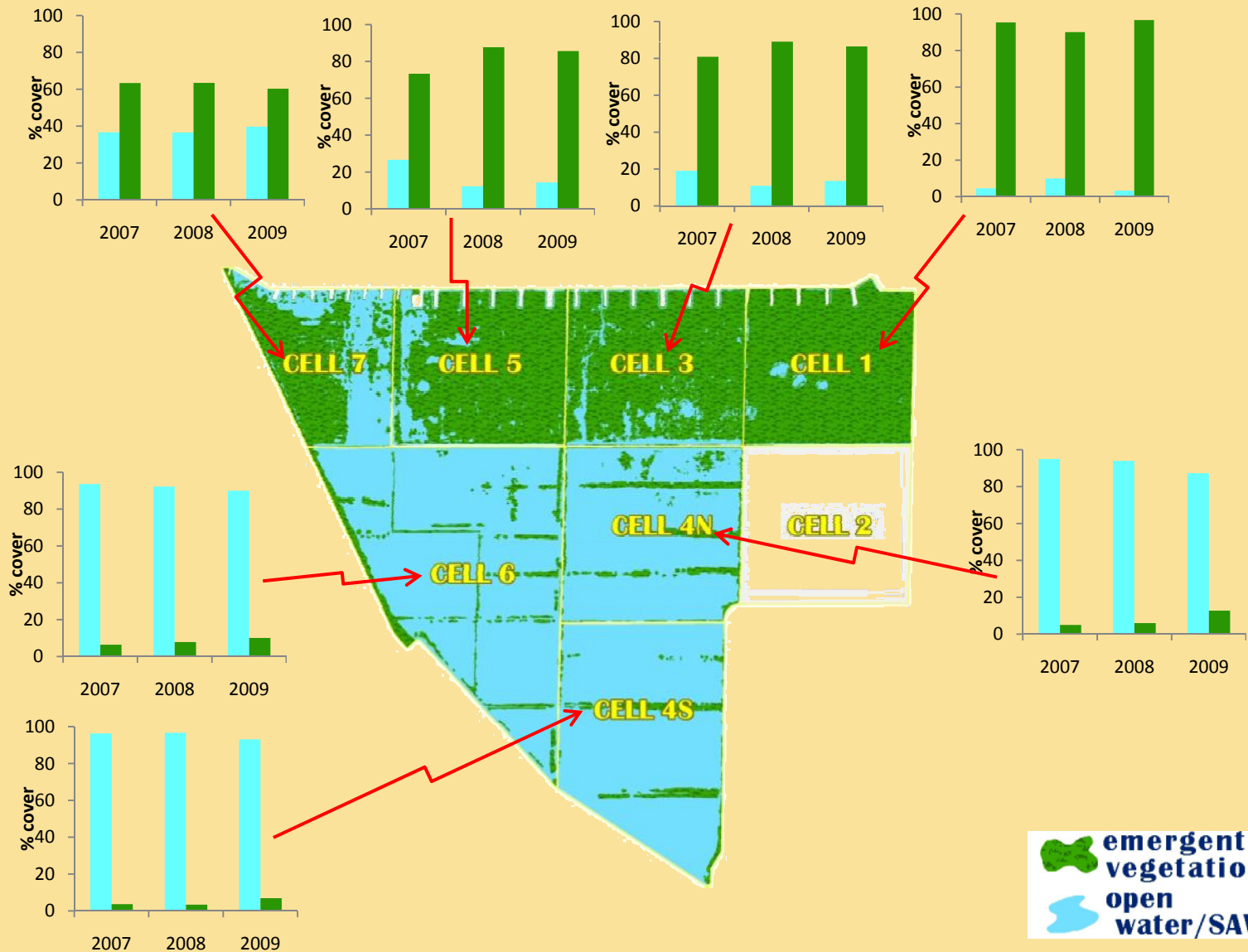


Vegetation Coverage Estimation

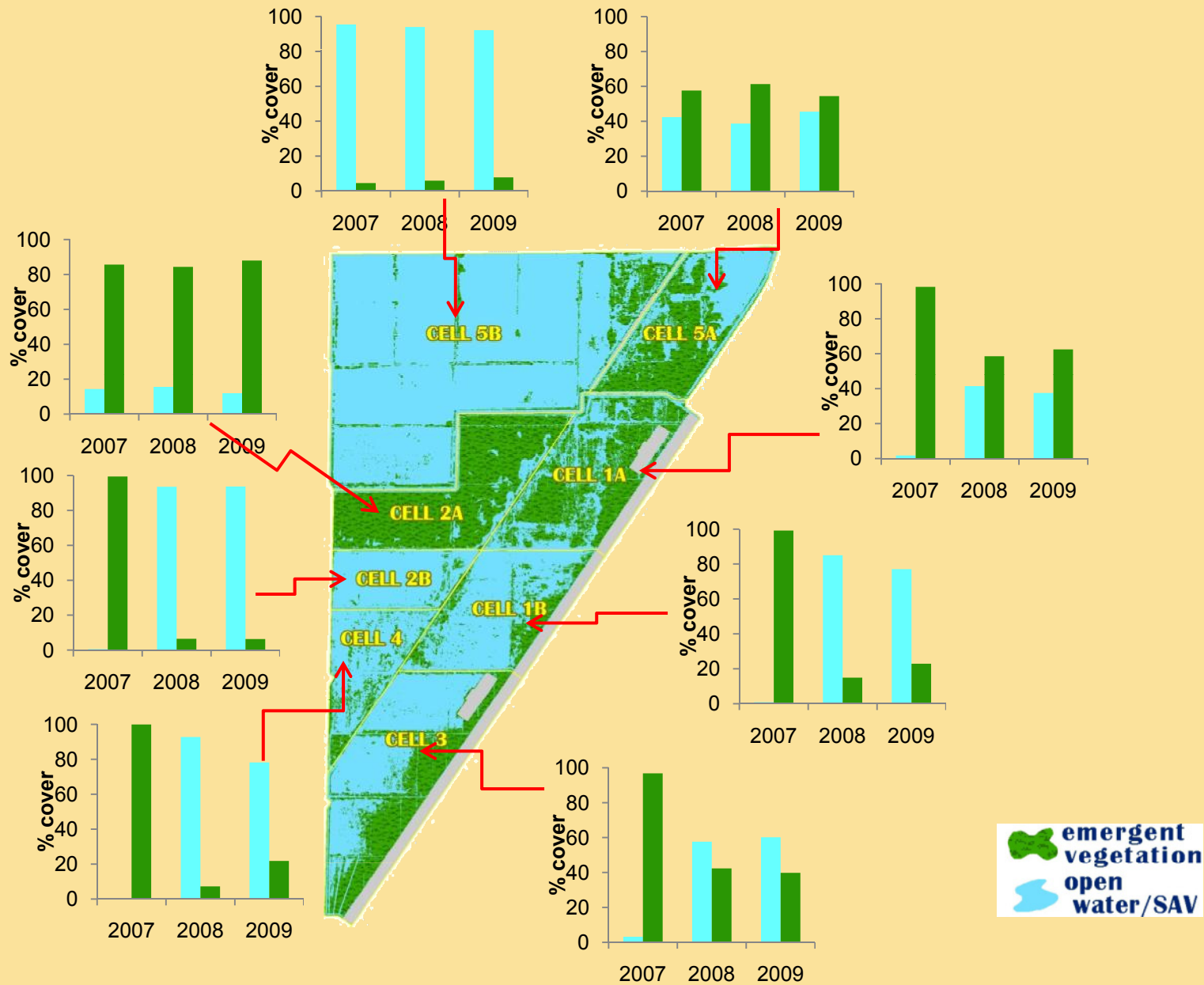


- 1) “Unsupervised classification,” using Erdas Imagine classification tools, of air photo imagery to separate vegetation from SAV+open water areas.**
- 2) SAV in shallow water initially included with emergent removed from classification using vector editing tools.**
- 3) Acreages obtained by GIS calculation tools.**

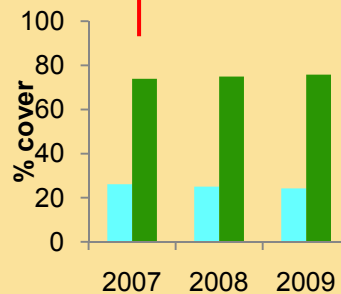
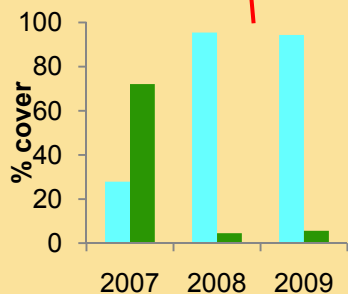
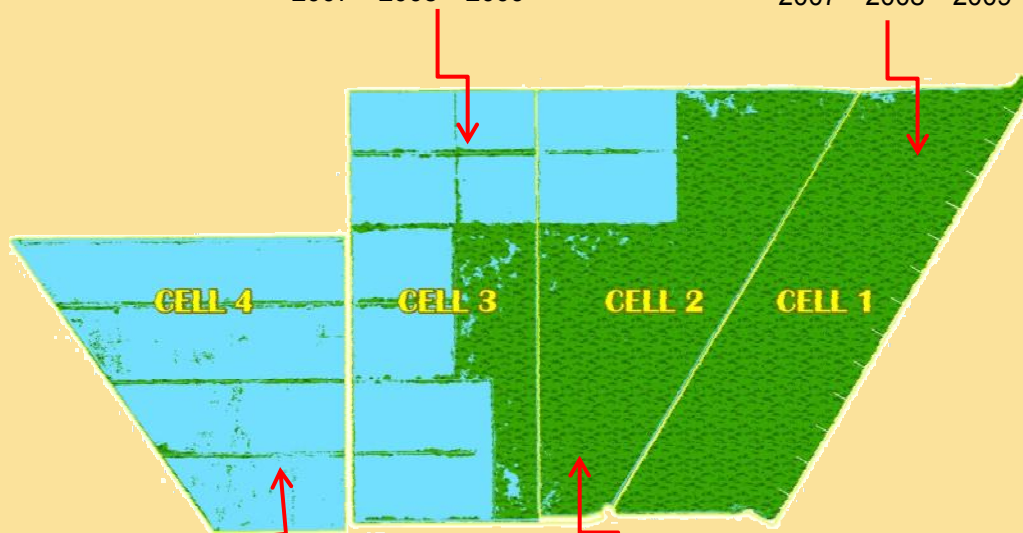
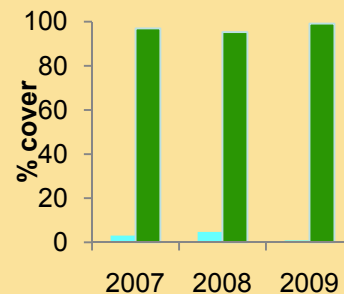
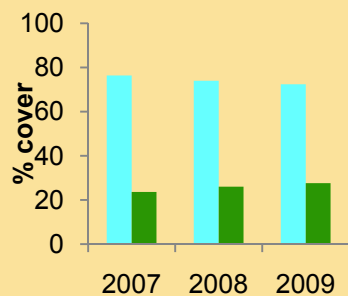
STA-1E EAV vs. SAV+Open Area Coverage



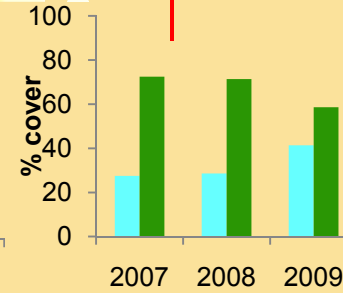
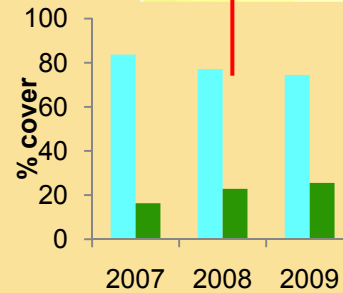
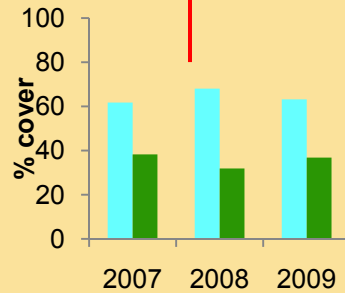
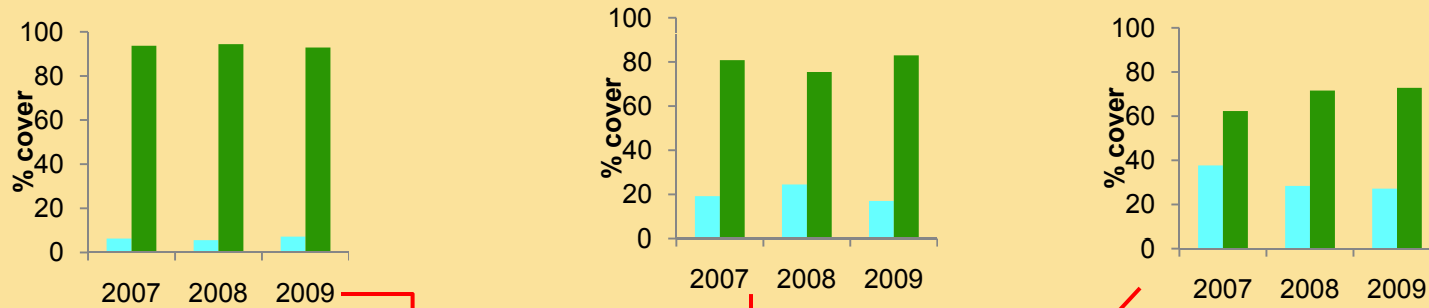
STA-1W EAV vs. SAV+Open Area Coverage



STA-2 EAV vs. SAV+Open Area Coverage

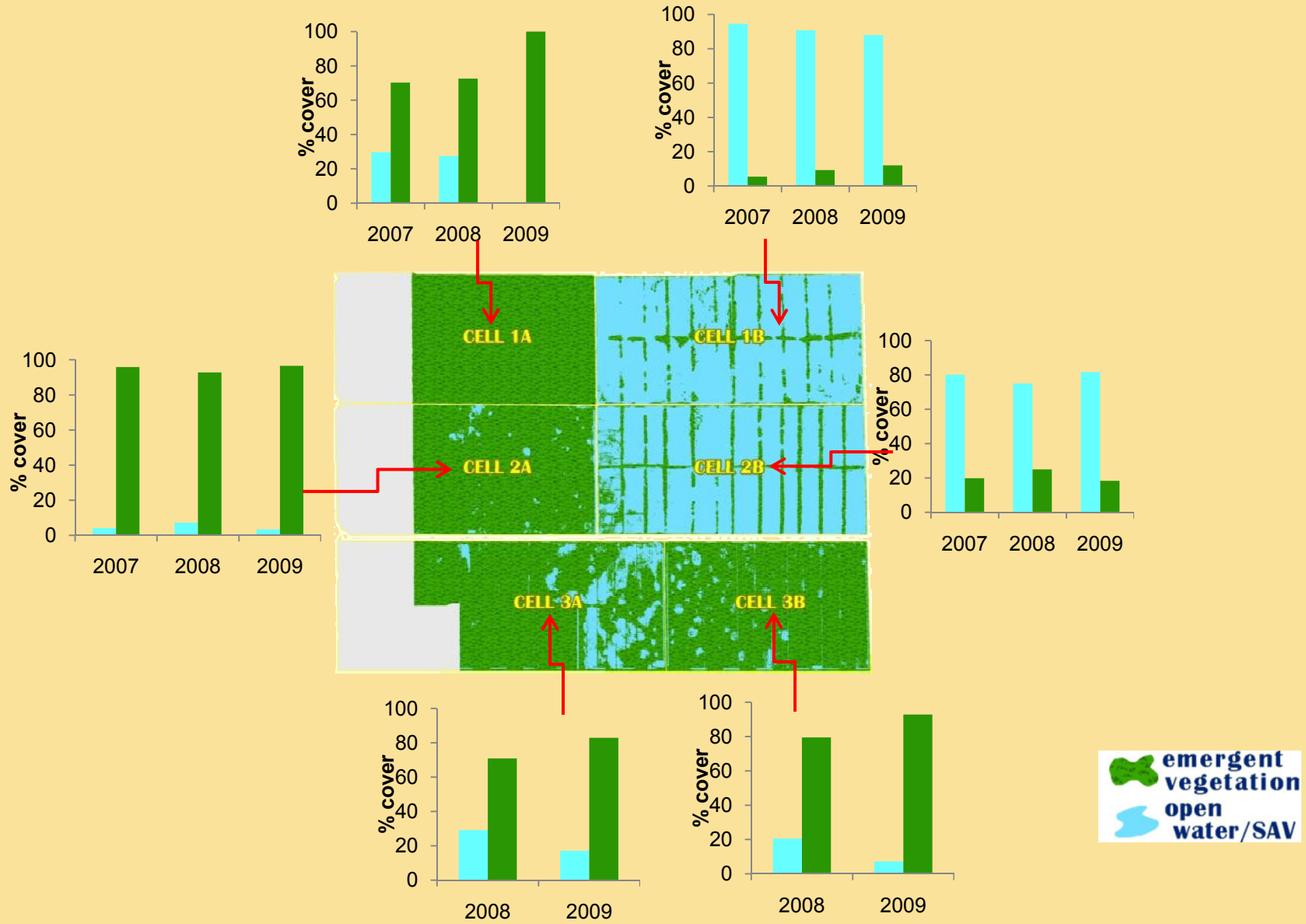


STA-3/4 EAV vs. SAV+Open Area Coverage

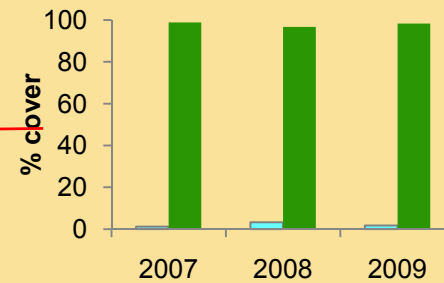
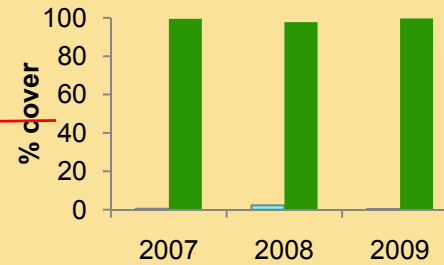
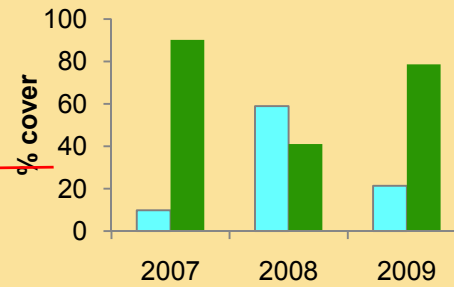


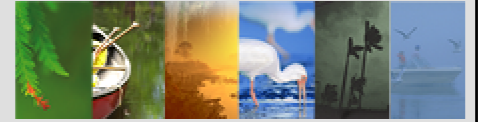
 emergent vegetation
 open water/SAV

STA-5 EAV vs. SAV+Open Area Coverage



STA-6 EAV vs. SAV+Open Area Coverage





SAV Coverage and Composition (STA-1E, STA-1W, STA-5, and STA-2)

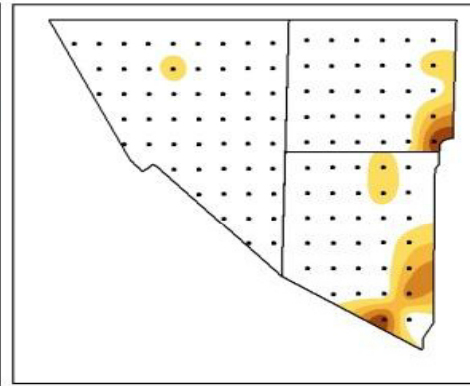
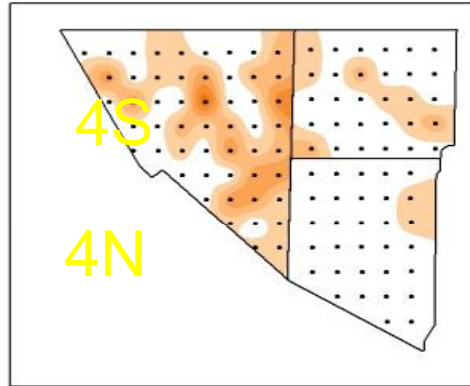
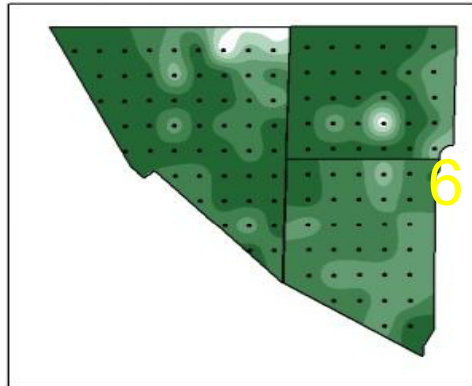
SAV Survey Methodology

- **Routine and event-driven surveys**
 - **Routine - at least once to 2x a year**
 - **Event-driven – ex. In response to storm, drought, rehabilitation, or other extreme events, such as the hydrilla die-off event**
- **Rake method to detect species, then visually survey vicinity to categorize density**

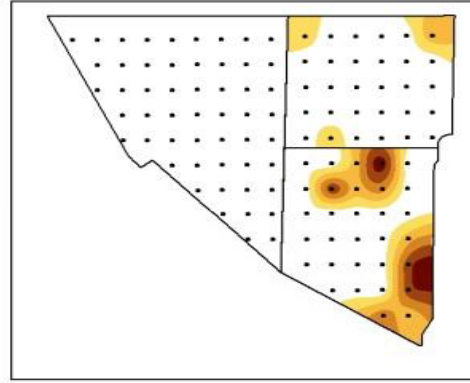
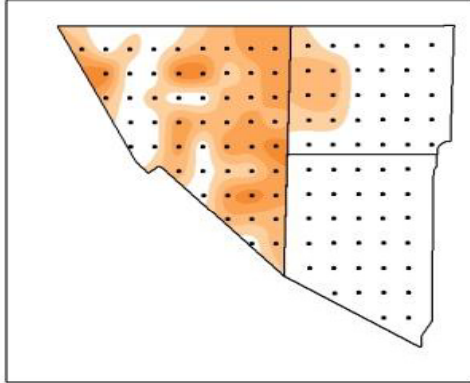
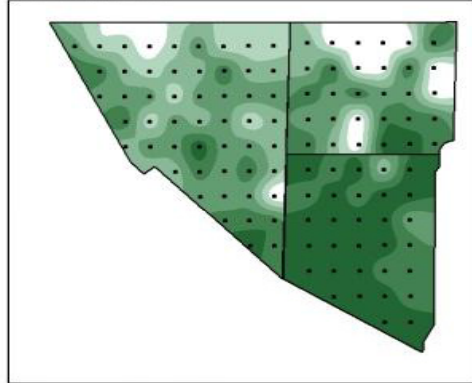


2009 and 2010 SAV Survey Results in STA-1E

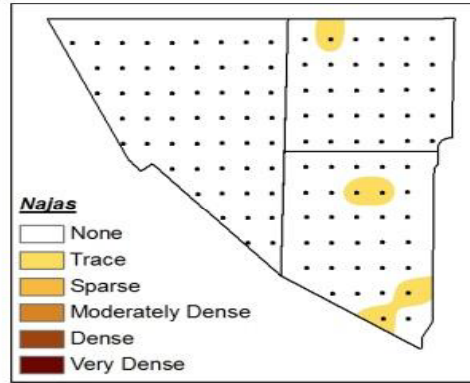
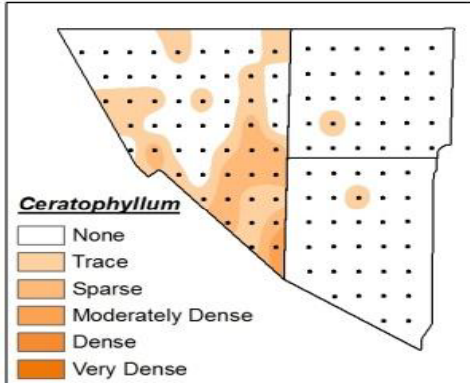
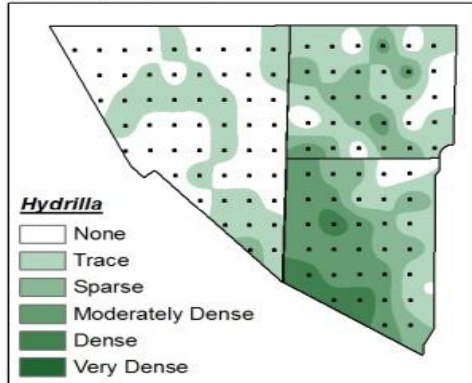
February 11, 2009



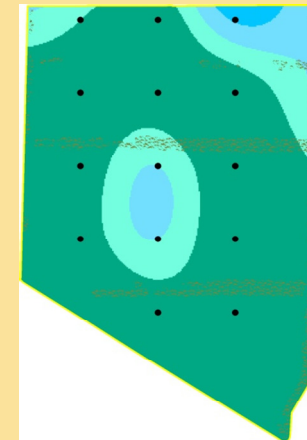
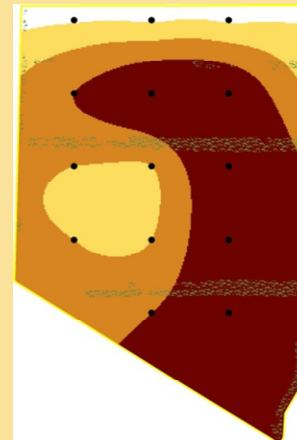
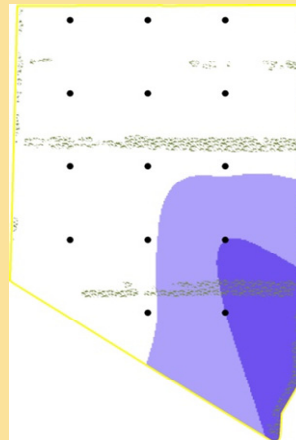
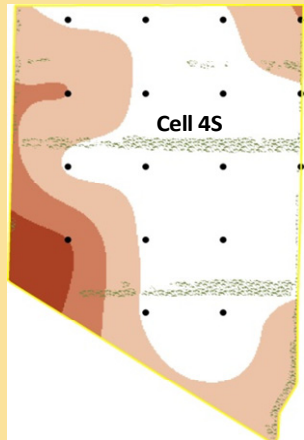
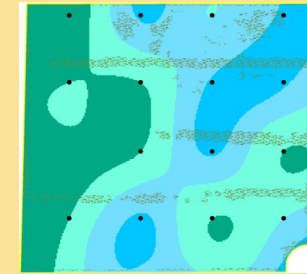
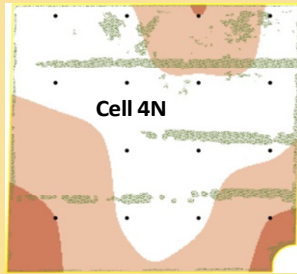
June 25, 2009



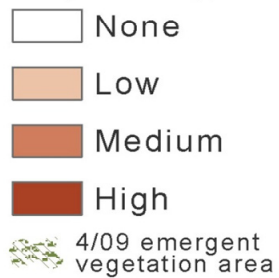
February 12, 2010



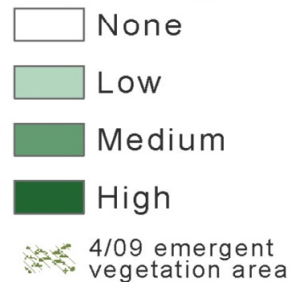
STA-1E Cells 4N and 4S SAV Survey, May 27, 2010



Ceratophyllum Density



Hydrilla Density



Chara Density



Najas Density



Total SAV Density

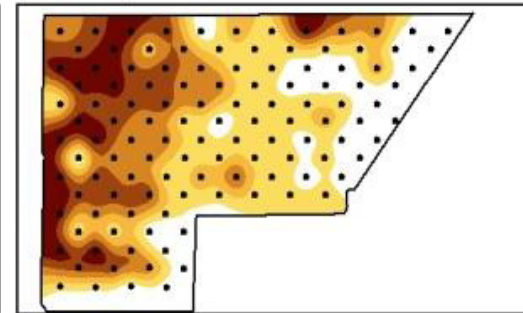
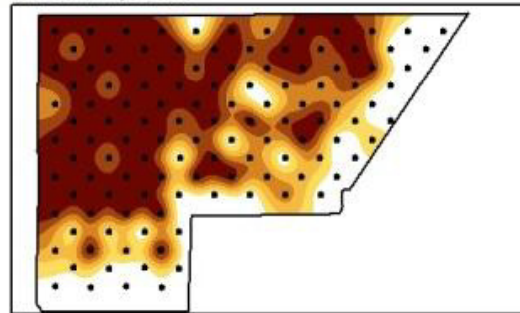
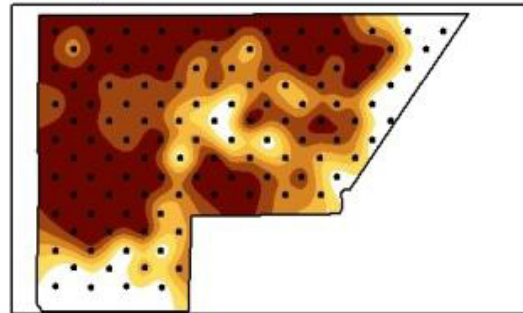


STA-1W Cell 5B Vegetation Survey

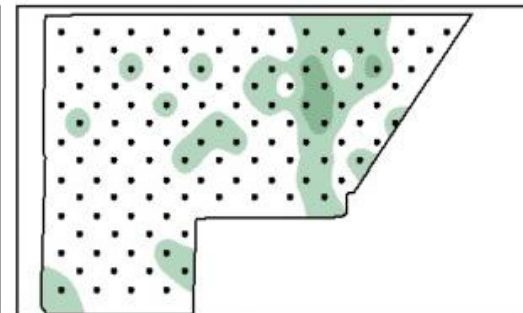
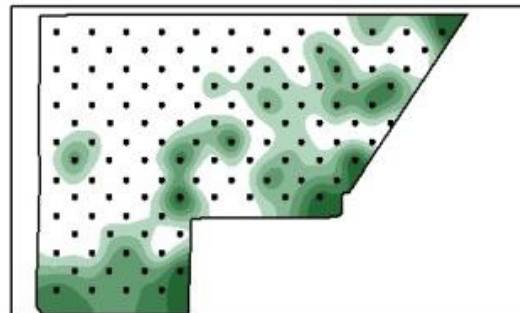
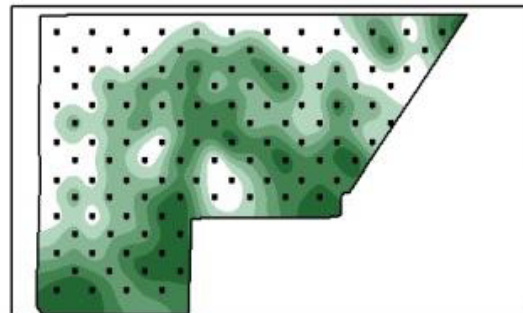
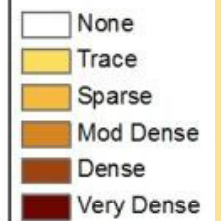
June 5, 2008

March 17, 2009

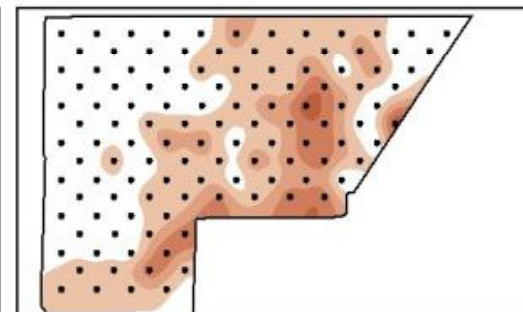
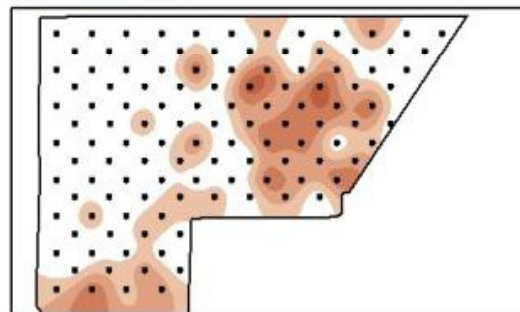
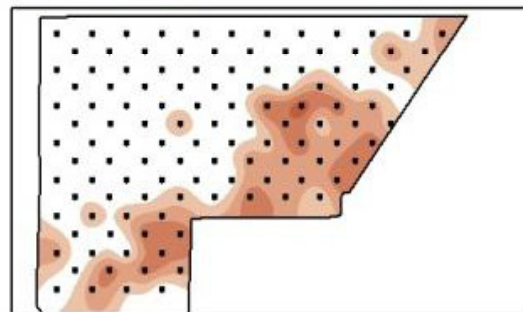
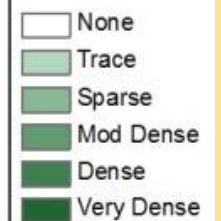
March 19, 2010



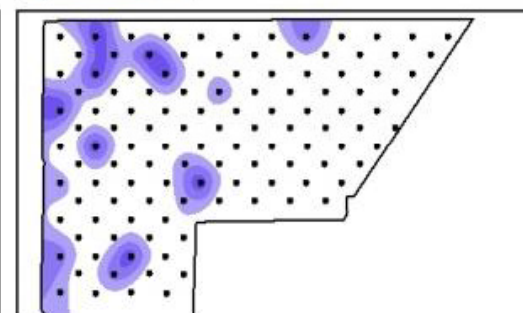
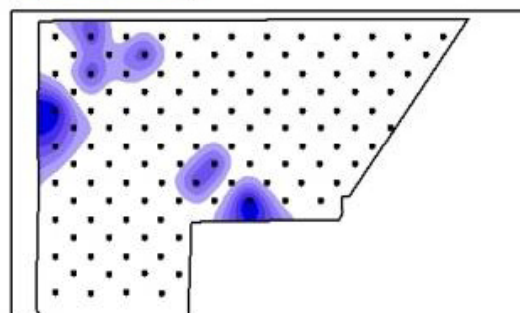
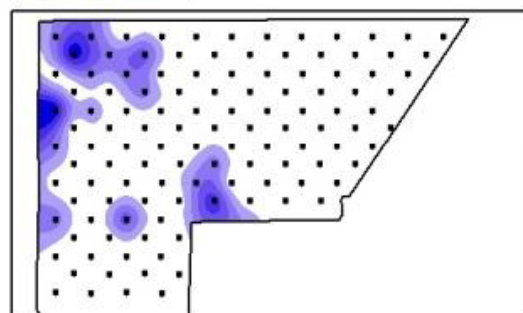
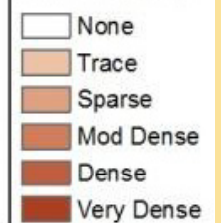
Najas



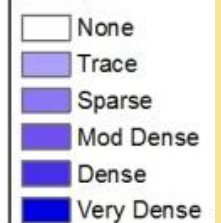
Hydrilla



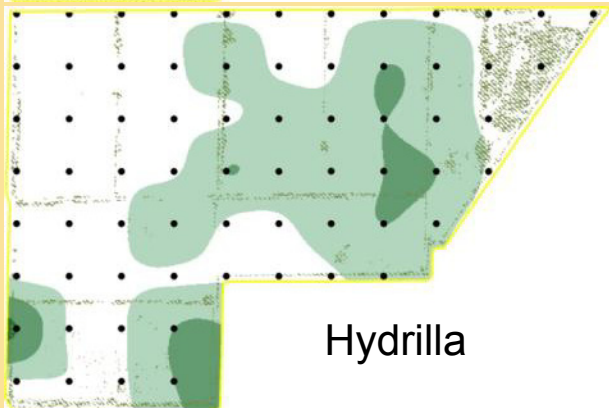
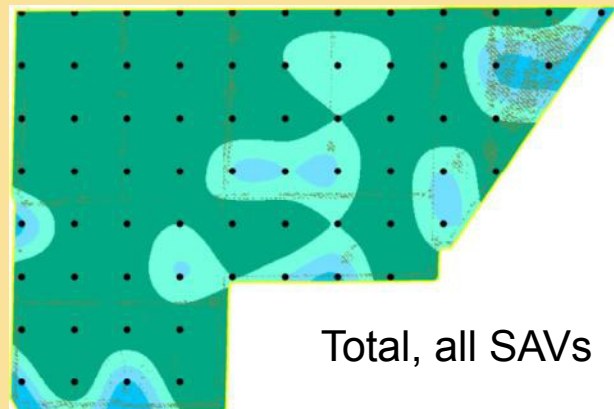
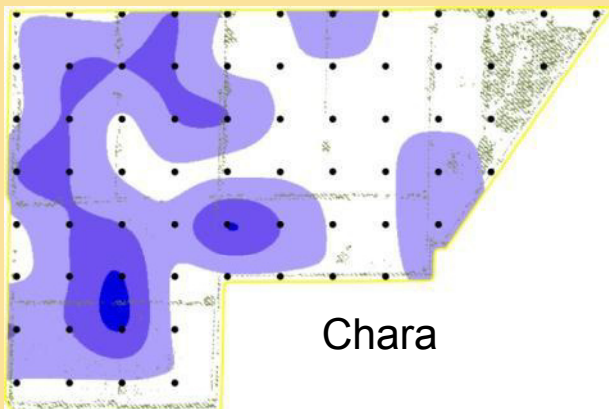
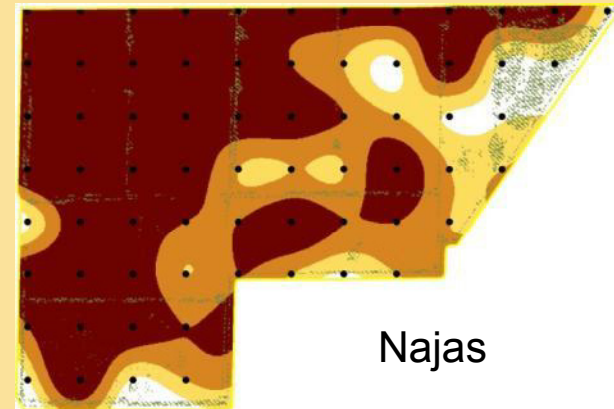
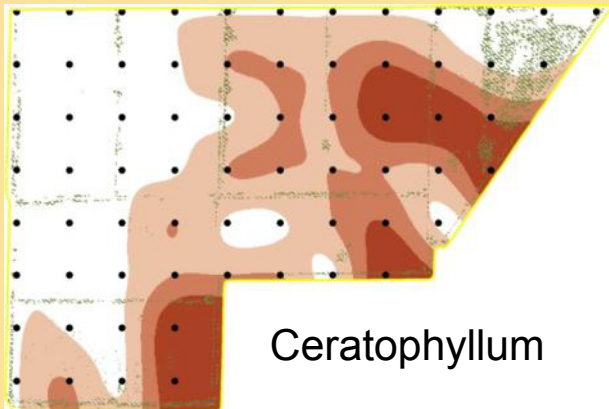
Ceratophyllum



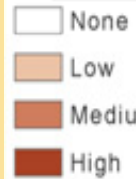
Chara



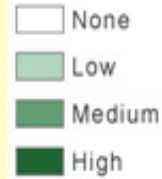
STA-1W Cell 5B on May 19, 2010



Ceratophyllum
Density



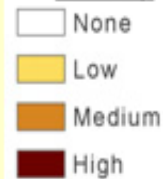
Hydrilla
Density



Chara
Density



Najas
Density

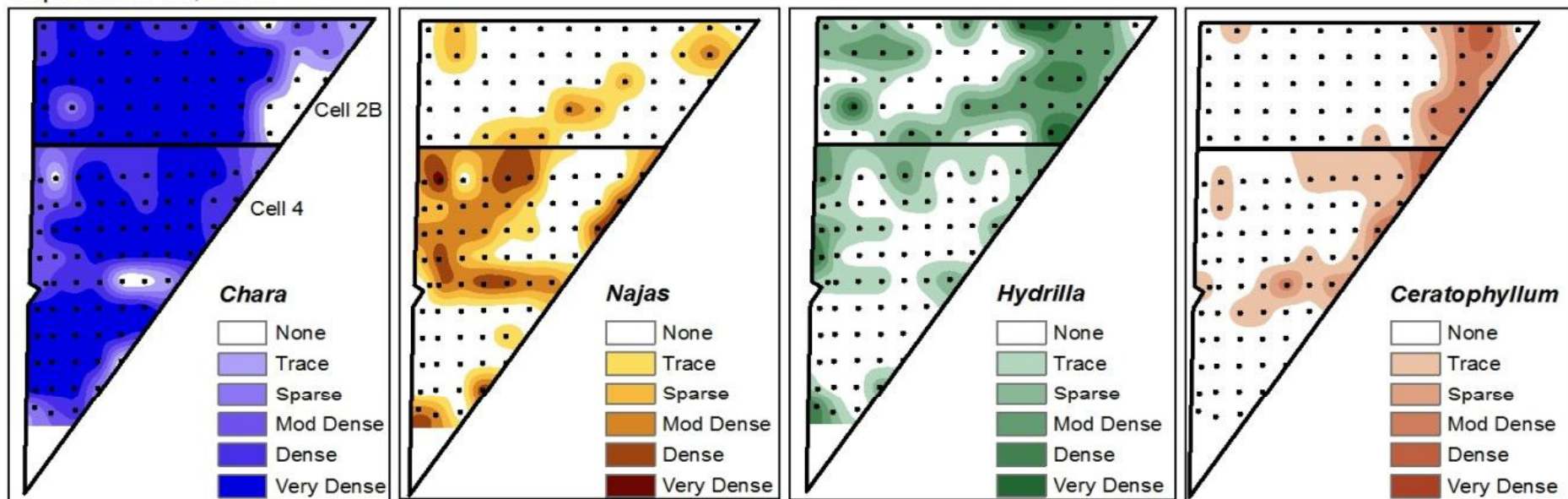


Total SAV
Density

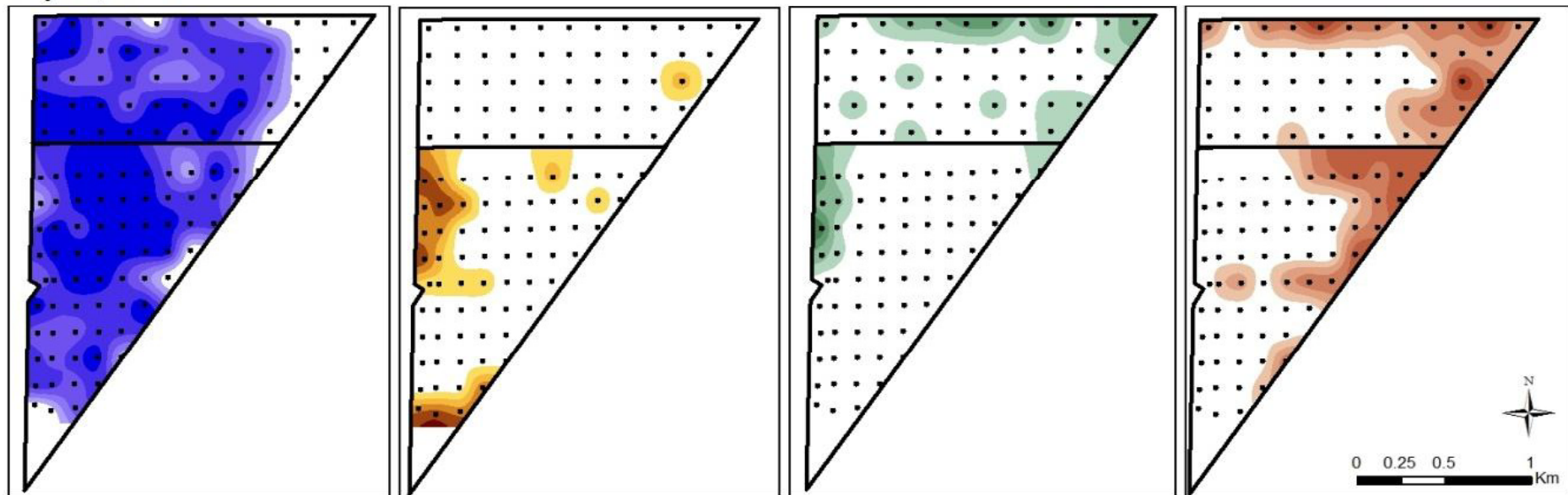


STA-1W Cell 2B and 4 Vegetation Survey

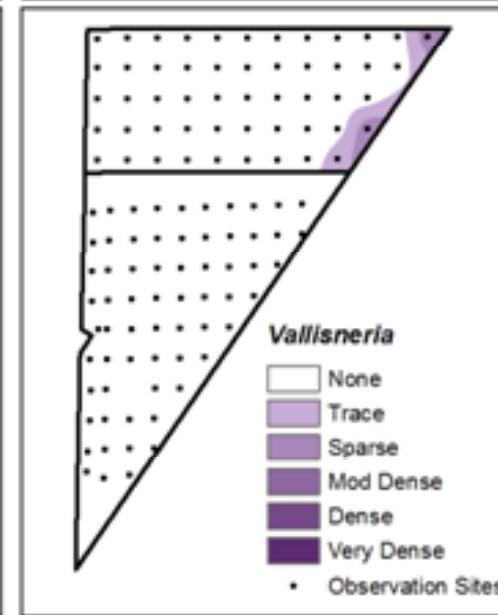
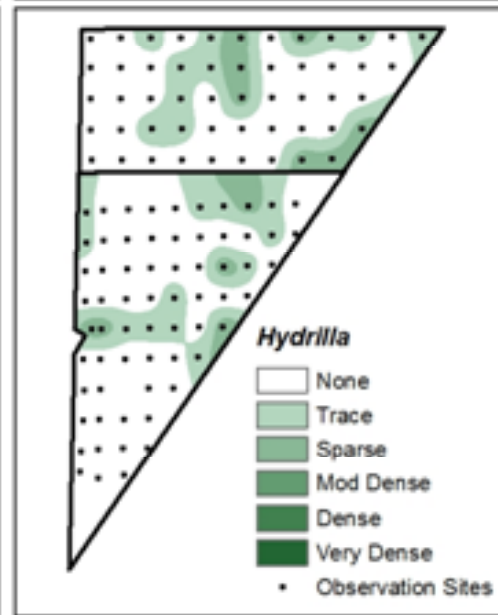
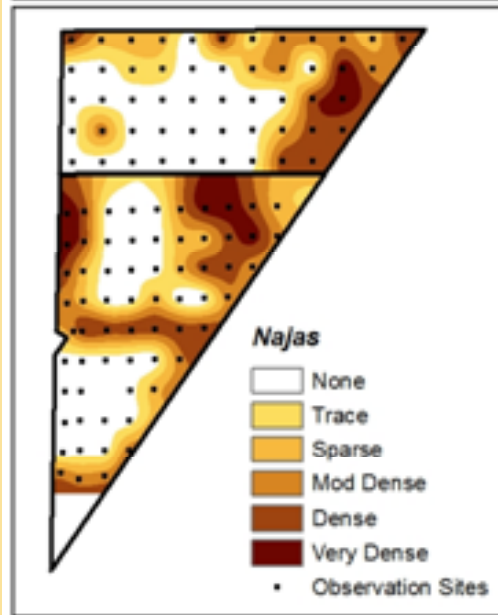
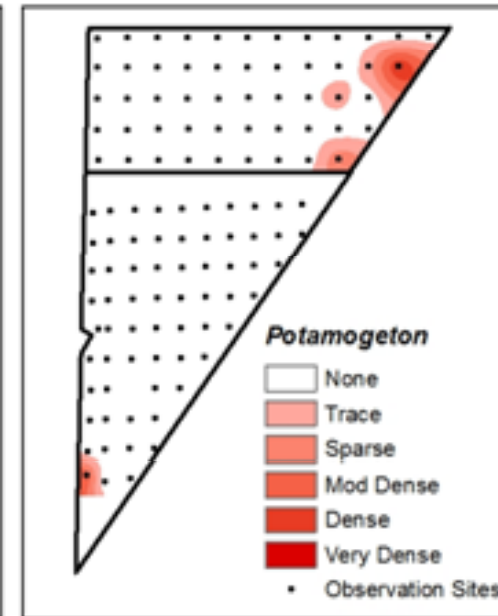
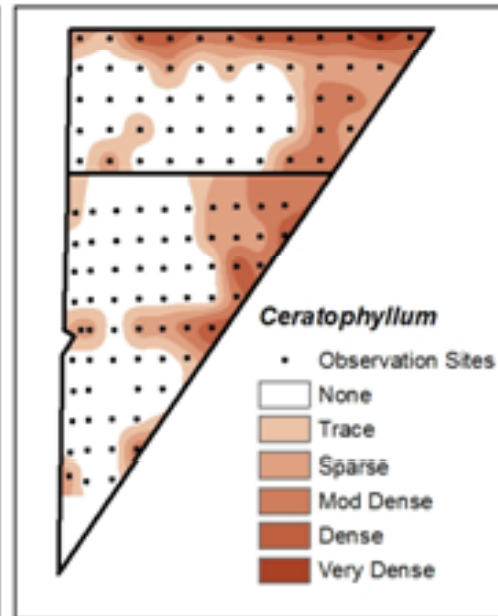
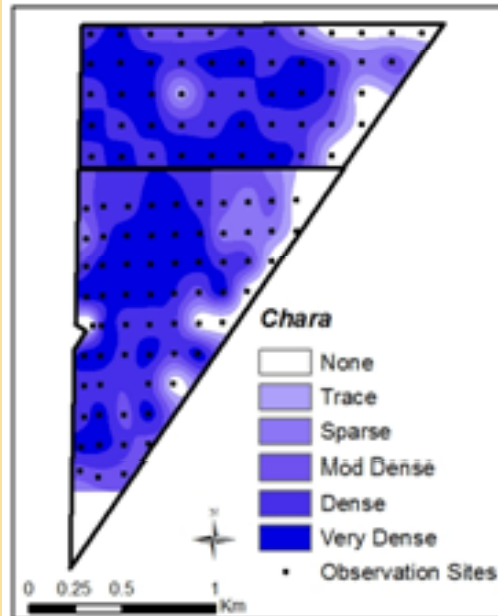
September 17, 2008



July 24, 2009

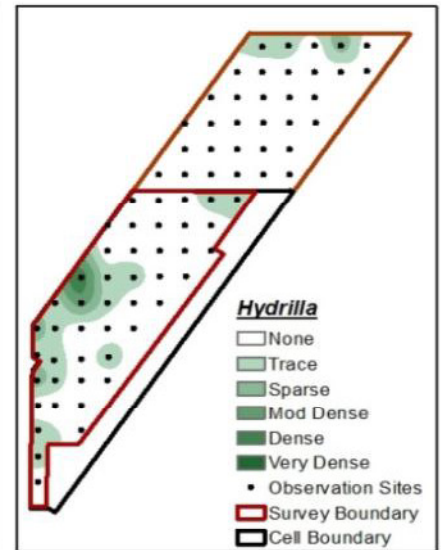
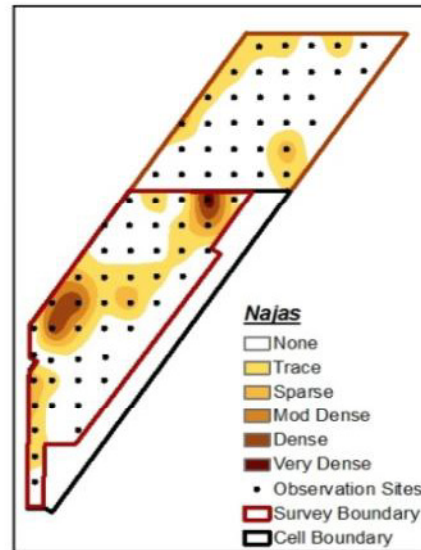
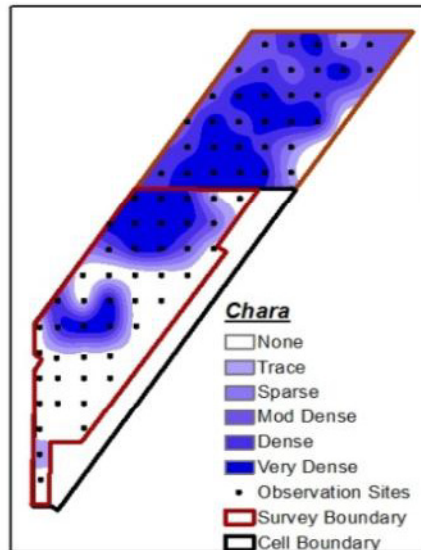
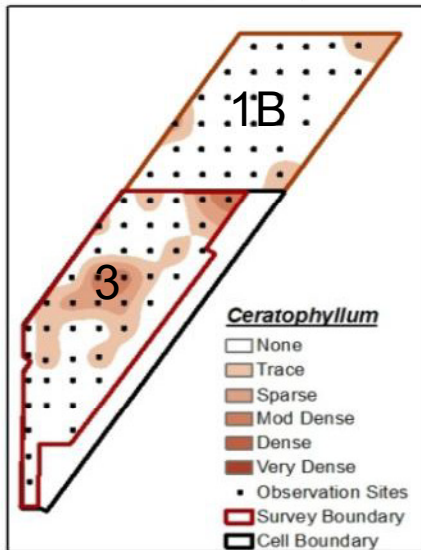


STA-1W Cell 2B and 4 Vegetation Survey: July 8, 2010

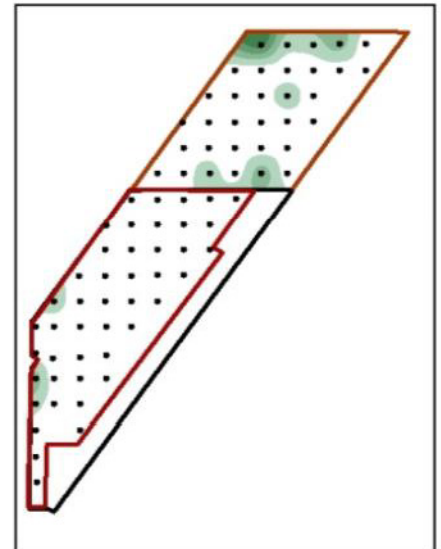
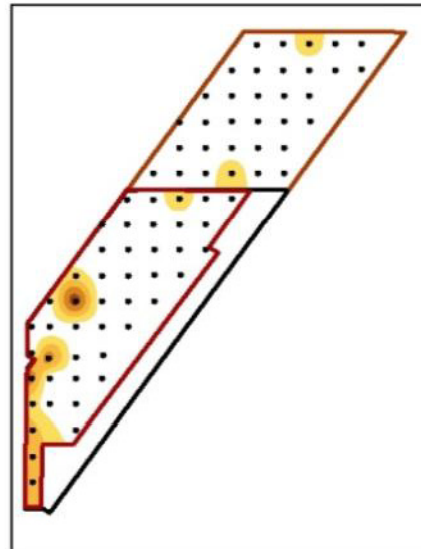
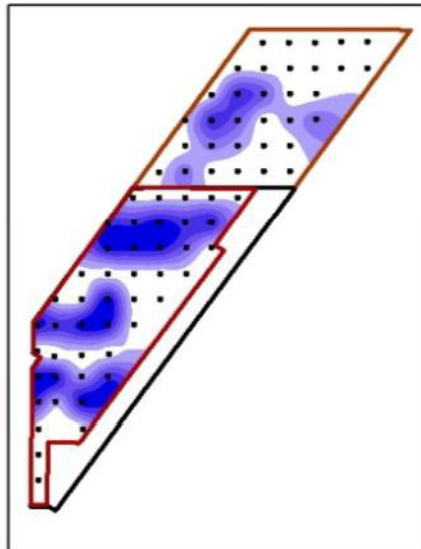
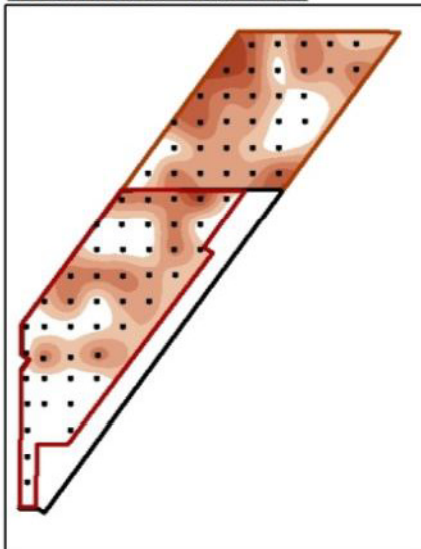


STA-1W Cells 1B and 3 SAV Surveys

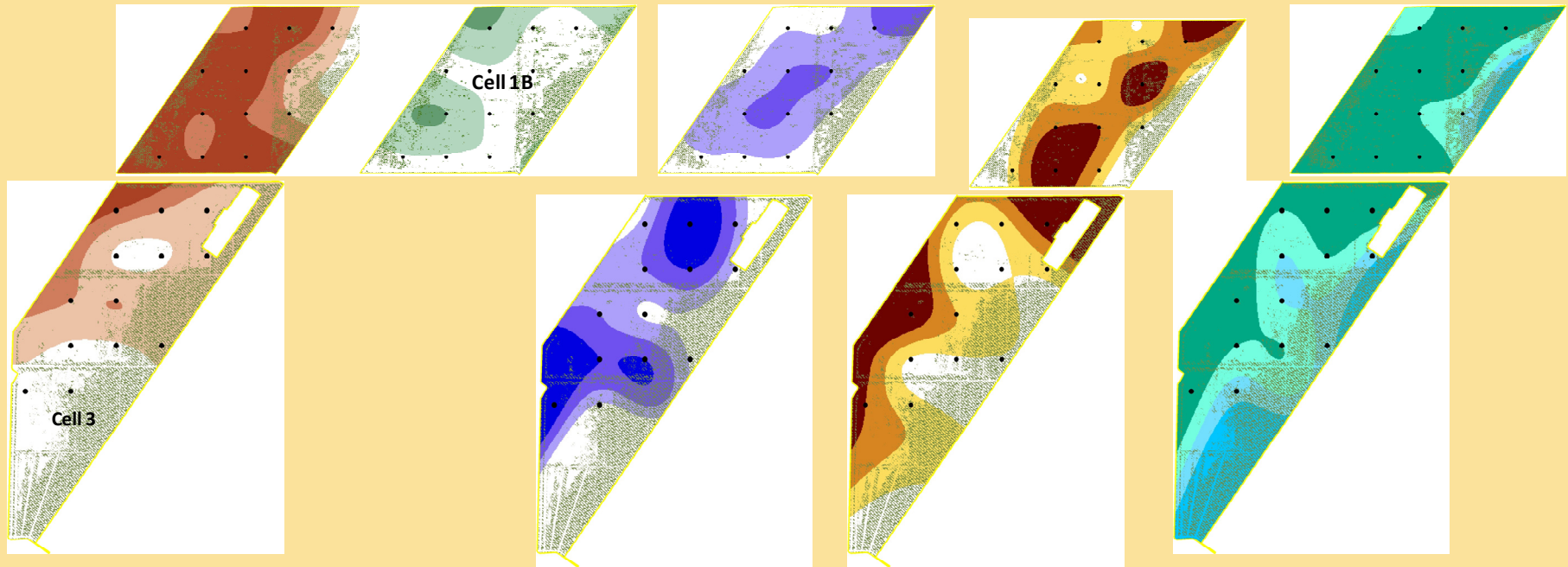
December 16, 2008



November 12, 2009



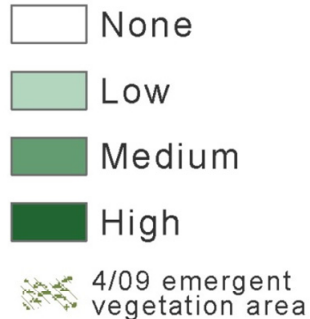
STA-1W Cells 1B and 3 SAV Survey, April 30, 2010



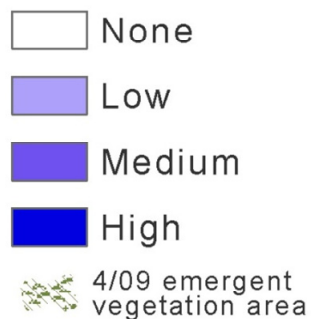
Ceratophyllum Density



Hydrilla Density



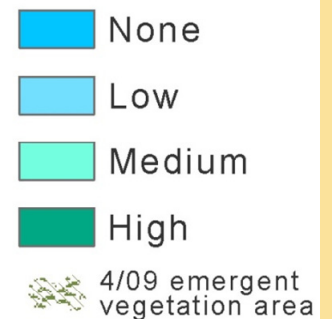
Chara Density



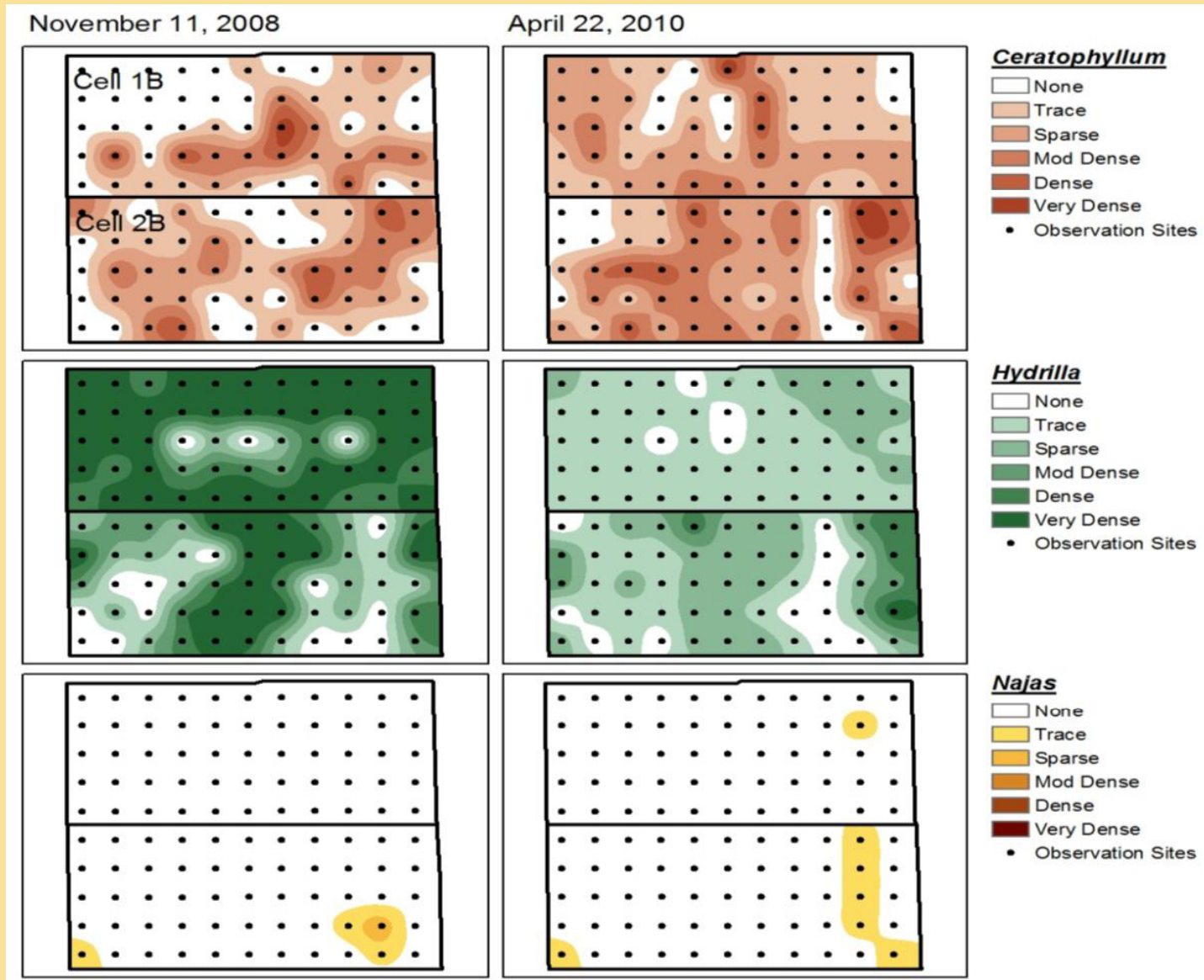
Najas Density



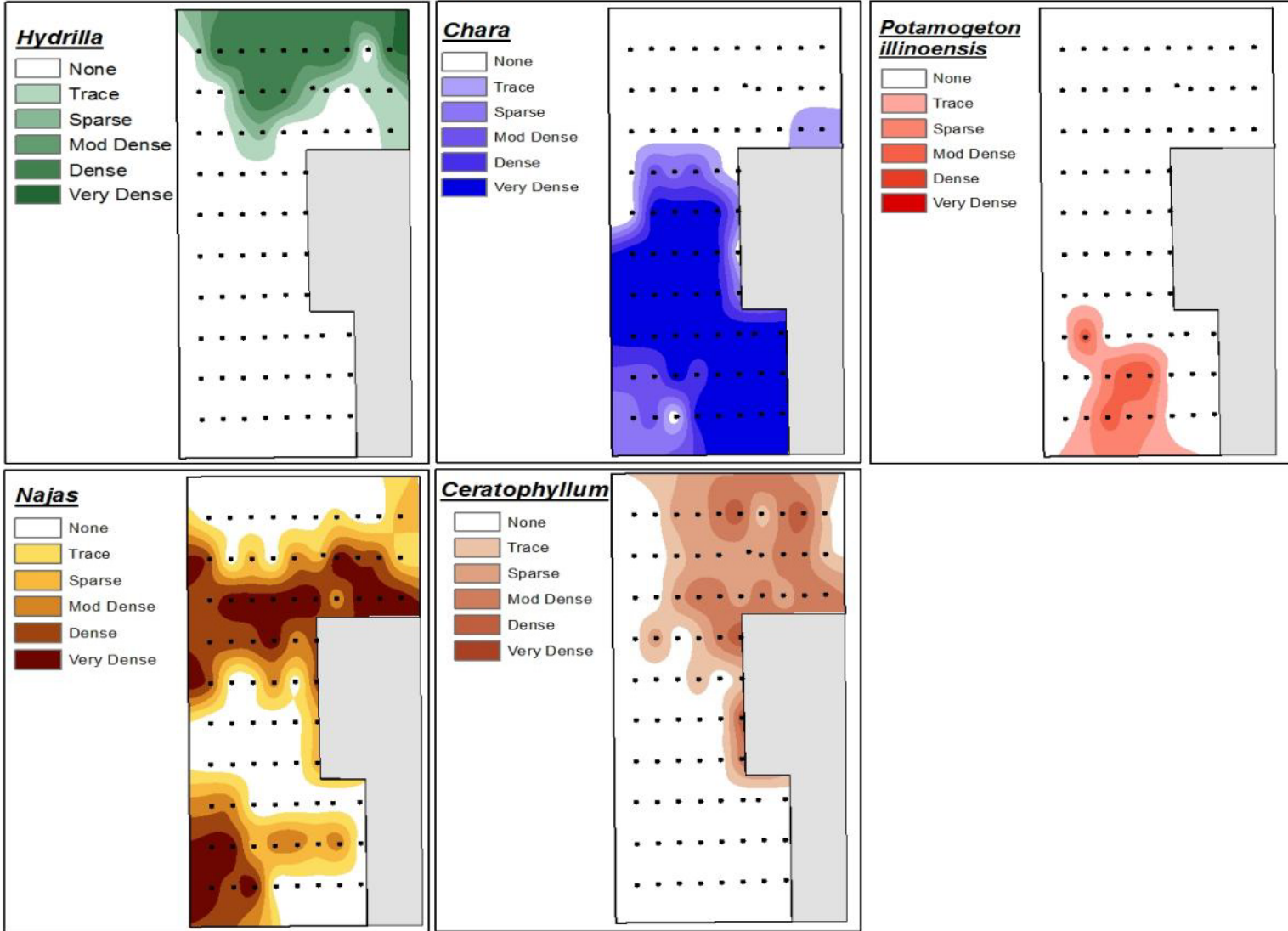
Total SAV Density



STA-5 SAV Survey, 2008 and 2010



STA 2 Cell 3 Vegetation Survey: October 16, 2009



STA-2 Cell 4 Vegetation Survey:
May 26, 2010

