

Notes on the ecology and distribution of five members  
of *Carex*, section Phaestoglochin in Maryland and the  
District of Columbia

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Heritage Service, Annapolis, MD

# Sedge Basics



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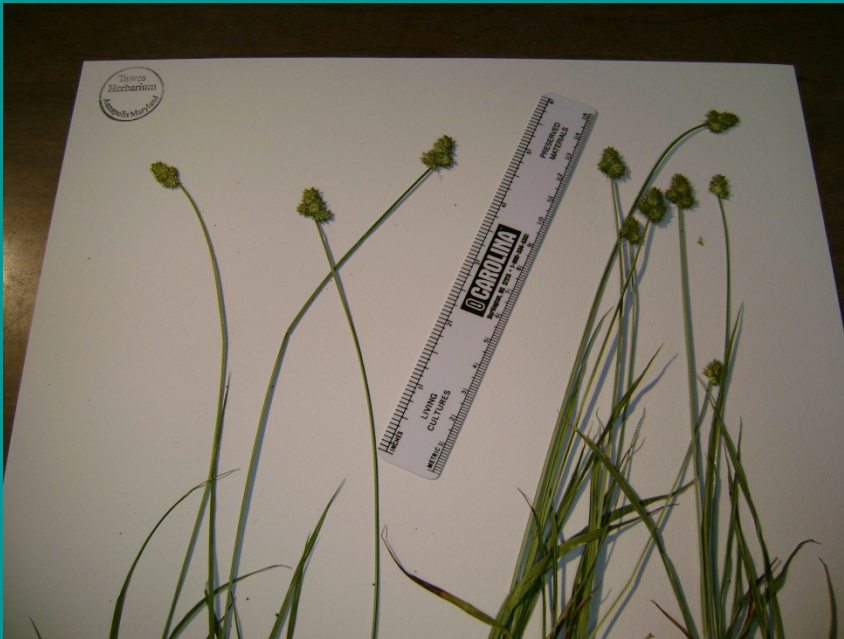


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## Ecologically diverse and globally distributed

- Flowering plants with tiny, reduced inflorescences reduced to scales and a sac-like structure or envelope surrounding the seed (achene).
- ~ 2000 species in the genus globally
- 179 taxa representing 162 species in Maryland/DC
- 18 species in Sec. Phaestoglochin

# Why Sect. Phaestoglochin?



- At a time of global change species in this section are “in motion”
- Among the most obscure and rarely collected species in the genus.
- Tell good stories.

# Warnings

- Sedges are not very photogenic.
- They all look alike.
- They pose significant identification problems, especially when immature or with incomplete specimens.
- They all have a complex collection history.
- The species considered here are near the northern or eastern extents of their geographic ranges.





FLORA OF MARYLAND  
Tawes Herbarium, Department of Natural Resources, Annapolis Maryland  
*Carex gracilis* Bailey



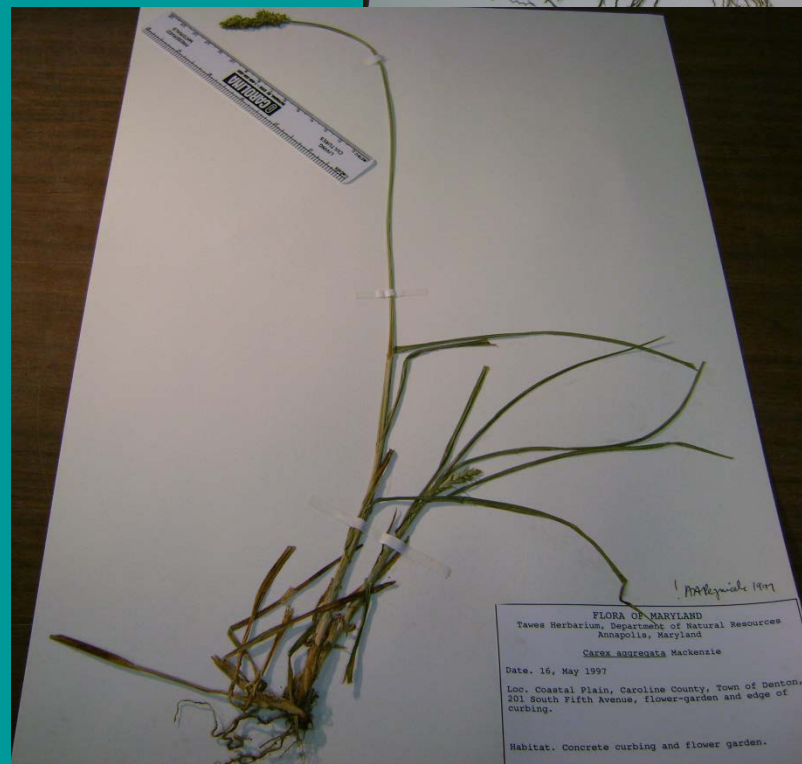
FLORA OF MARYLAND  
Tawes Herbarium, Department of Natural Resources, Annapolis Maryland  
*Carex leavenworthii* Dewey

Date. 23 May 2010

Loc. Coastal Plain, Talbot County, Town of Easton, lawns surrounding the Presbyterian Church at 517 North Washington Street.  
Frequent



FLORA OF MARYLAND  
Tawes Herbarium, Department of Natural Resources, Annapolis Maryland  
*Carex mesochorea* Mackenzie  
Date. 6 June 2011  
Loc. Outer Coastal Plain, St. Mary's County, campus of St. Mary's College of Maryland, old fields at the junction of Mattapani Road and Campus Drive.  
Habitat. Meadows, with native old-field grasses and exotic forb plantings. Growing with *Carex acutifolia*.  
Coll. Christopher T. Frye 8177



FLORA OF MARYLAND  
Tawes Herbarium, Department of Natural Resources, Annapolis Maryland  
*Carex aggregata* Mackenzie

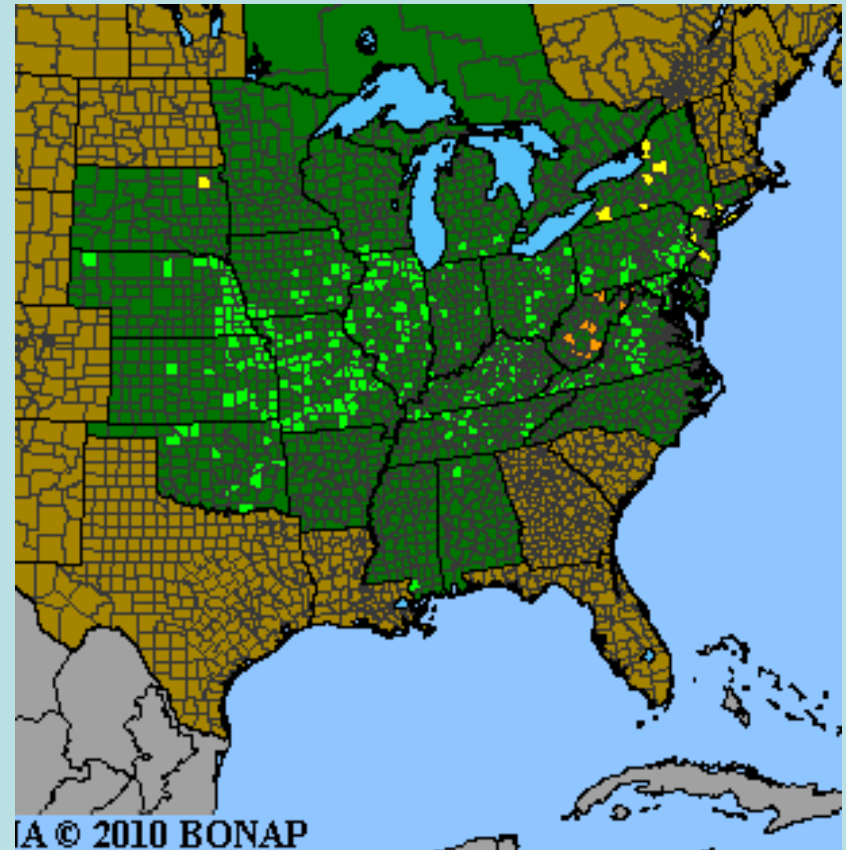
Date. 16, May 1997

Loc. Coastal Plain, Caroline County, Town of Denton, 201 South Fifth Avenue, flower-garden and edge of curbing.

Habitat. Concrete curbing and flower garden.

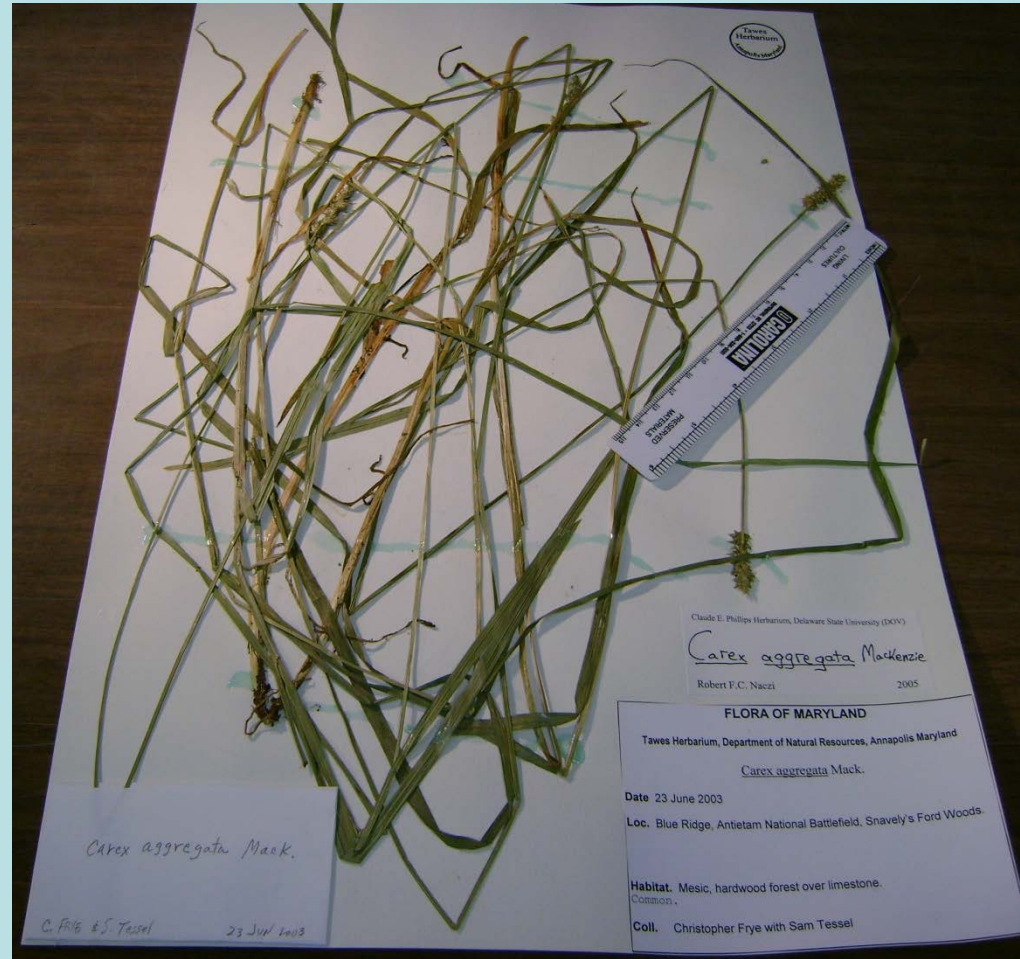
# *Carex aggregata* Mackenzie

- At one time thought to be extirpated in Maryland with few historical records.
- Thought to be associated with calcareous glades and woodlands perhaps resembling prairies?



# Found it in some really nice places

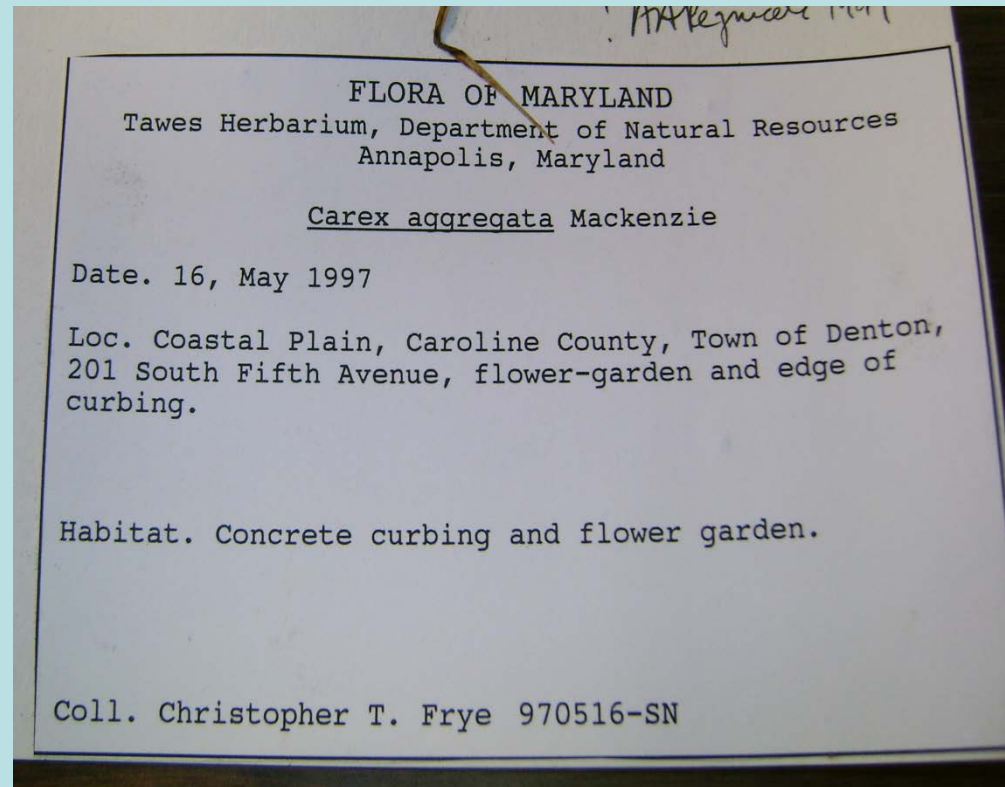
- Mesic bottomland forests over limestone.
- Early collections from “Serpentine Barrens of Maryland”, Cecil County, June 30, 1913, *Bayard Long* 8672 (PH).
- That fits.
- But . . .





# What's going on?

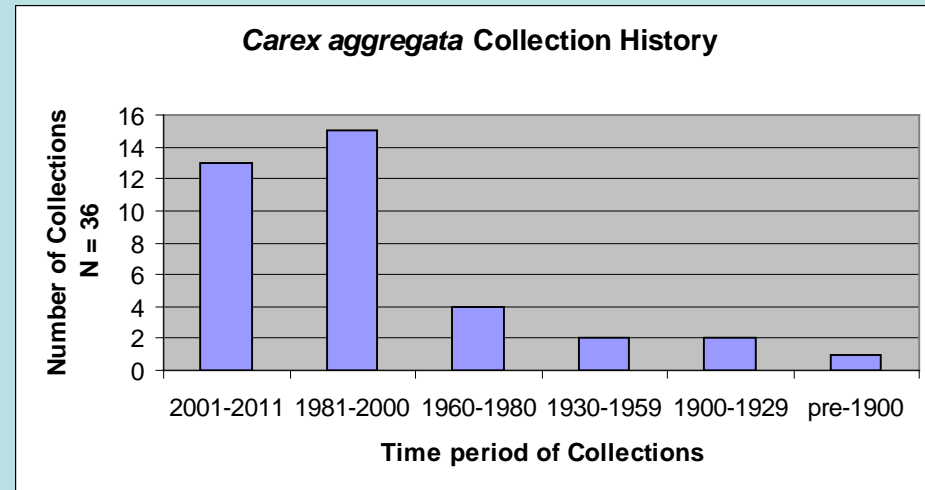
- Collections started pouring in from 1996-2000.
- From some surprising places.





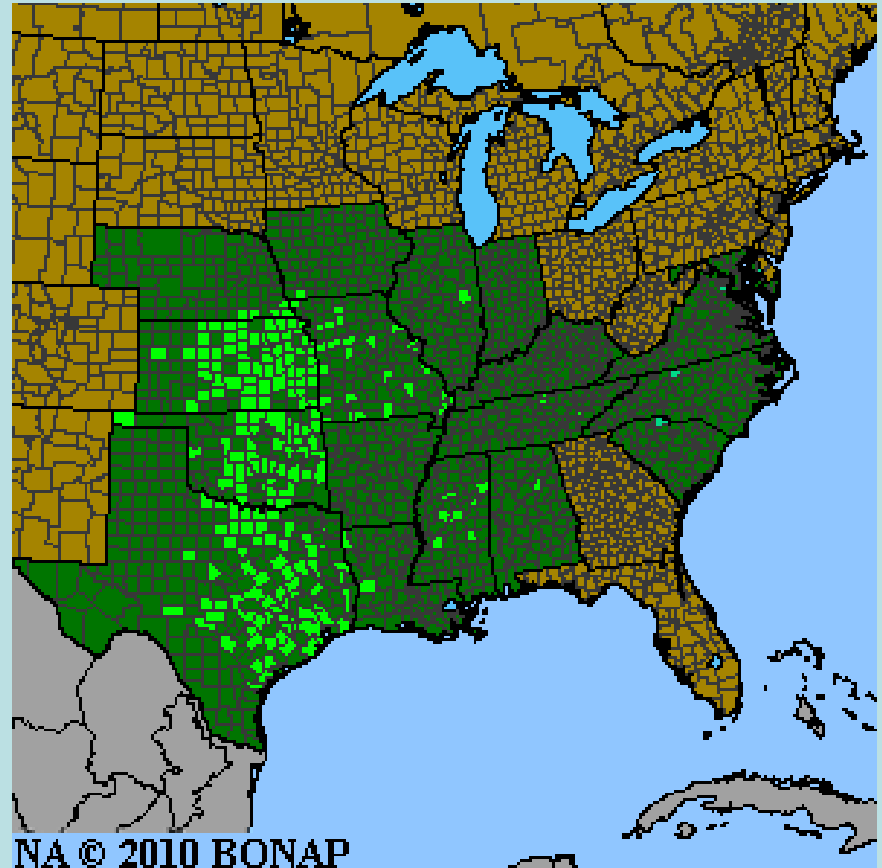
# Extremely adaptable, easily dispersed or just overlooked?

- Earliest collection 1875 from “State Department Grounds, Georgetown”
- Hmm, where else?
- 1915, E. S. Steele’s “backyard”
- 1928, “North side of mall, Washington DC”
- “Rocky bank along P.R.R. by Susquehanna River”, *Bayard Long and E. B. Bartram* 1239 June 1, 1913, (PH).



# *Carex australina* (Small) Mackenzie

- Not known from Maryland prior to 1998.
- First appeared in native, warm-season grass plantings used to enhance wildlife values of meadows.



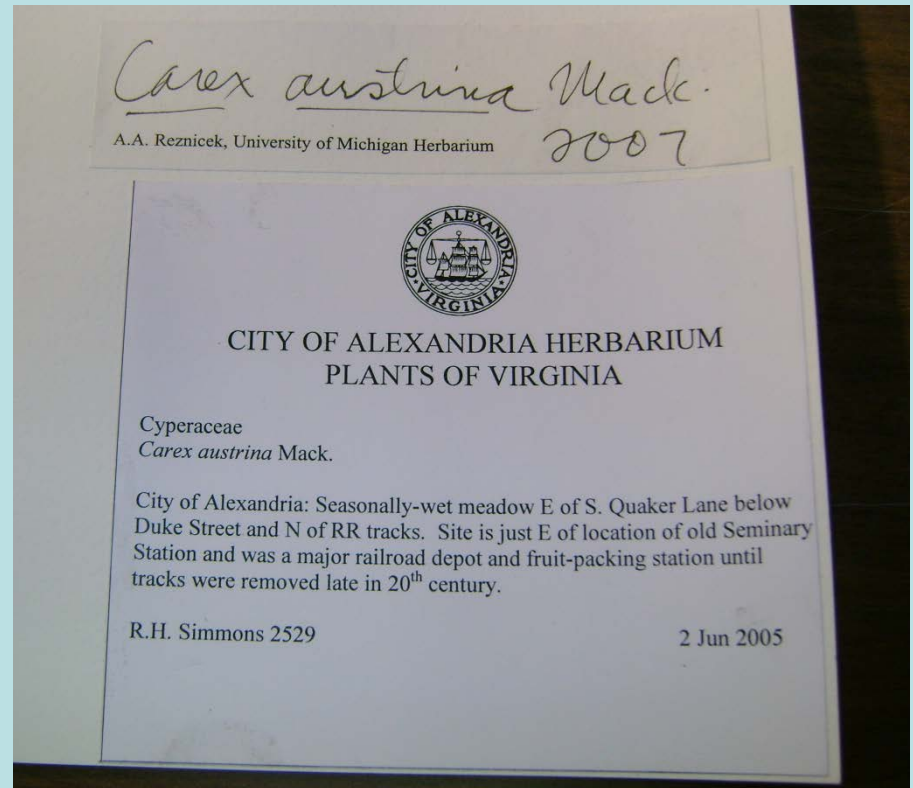
Predictability so far = 75%





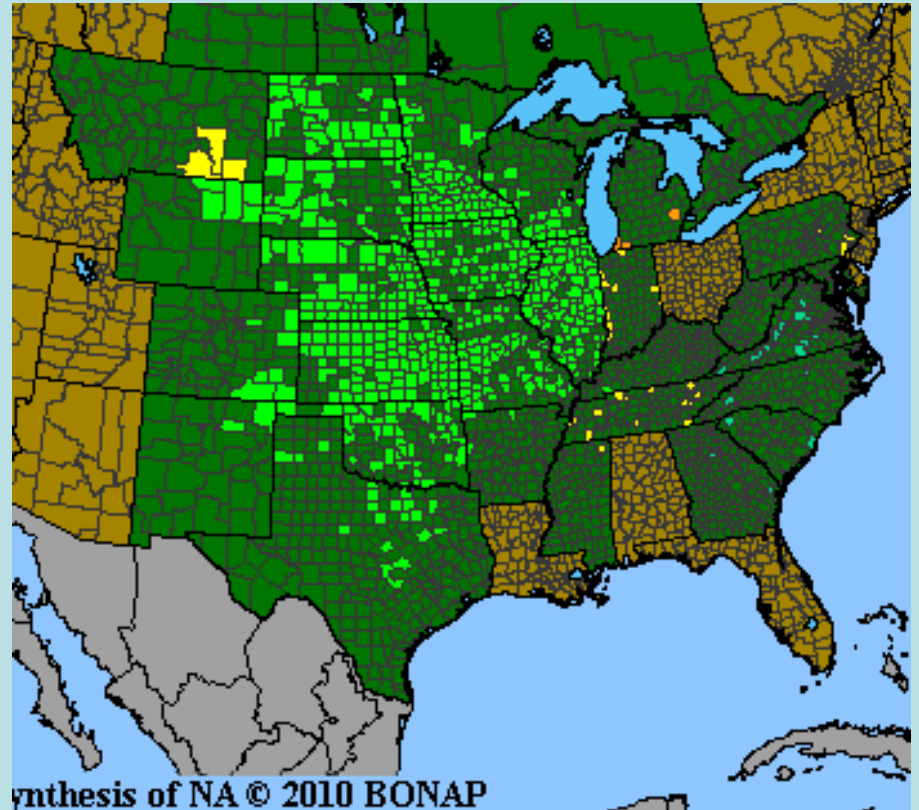
# Expect to find more

- Rather obviously associated with human-transport.
- An additional 2 Maryland Counties added to the distribution in 2011: Saint Mary's and Talbot.



# *Carex gravida* Bailey

- Not known from the Maryland Flora prior to 1999.
- First collected in a meadow in Calvert County.



# Dispersal mode?



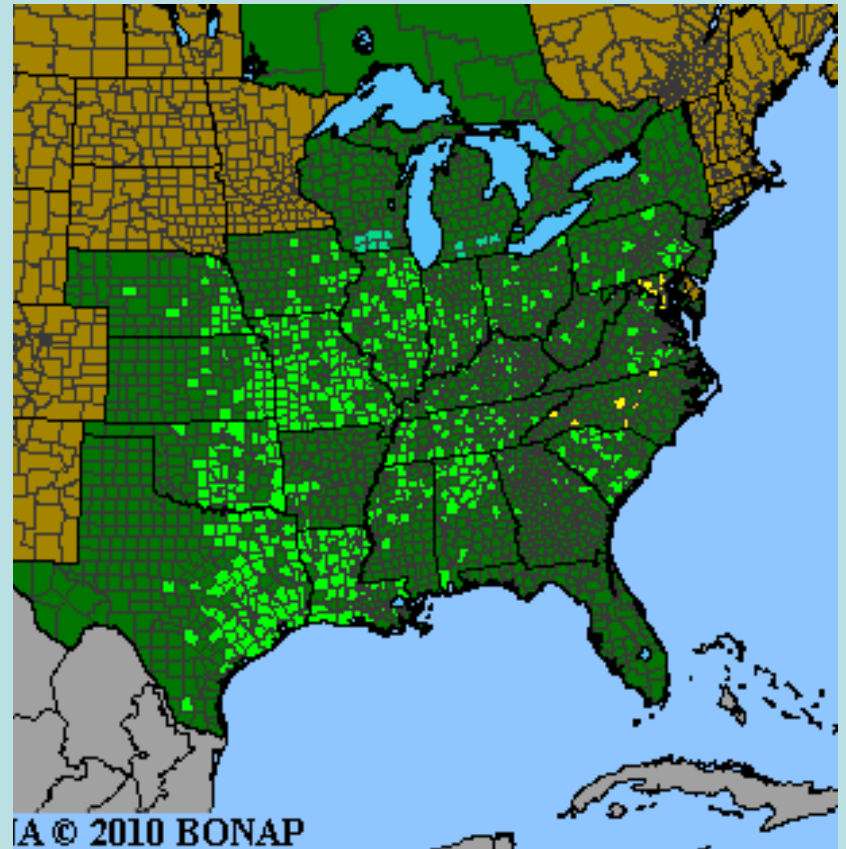


# Expect to find more

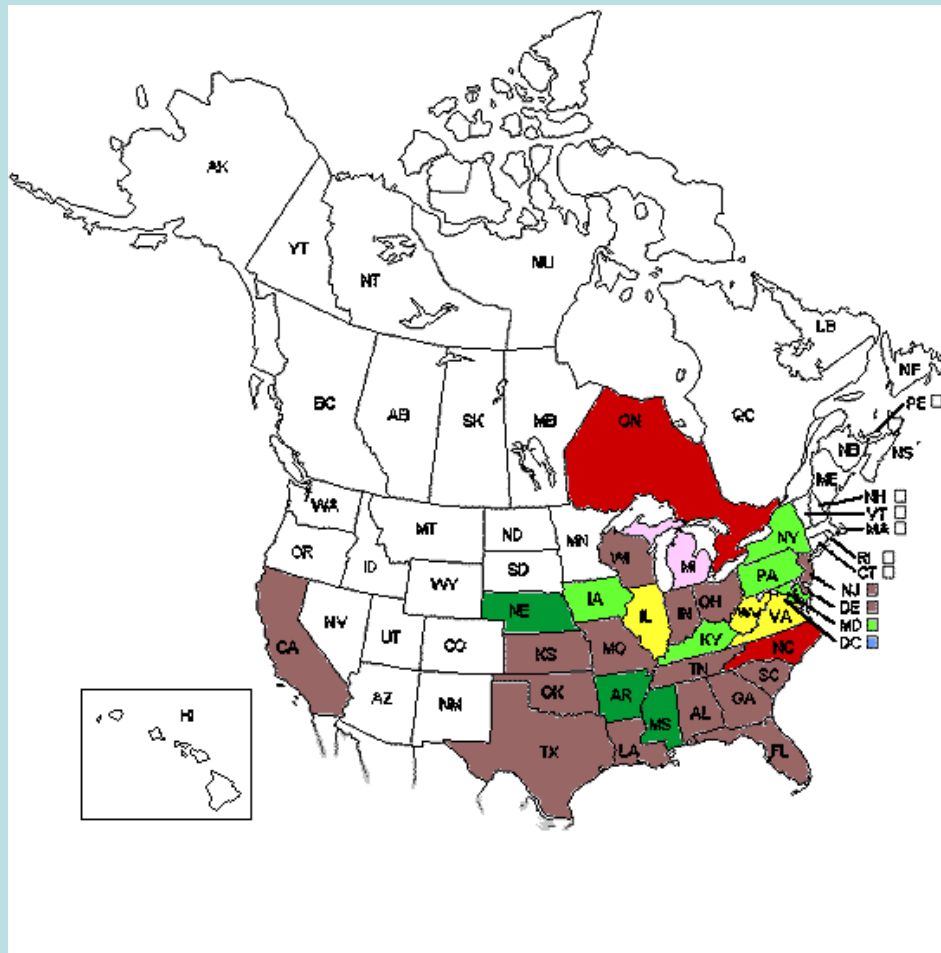


# *Carex leavenworthii* Dewey

- Thought to be extirpated in Maryland prior to 1997.
- Associated with rich, dry woodlands and rocky, riverside prairies.



# Conservation ranks for *C. leavenworthii*



## State/Province Conservation Status

<span style="display:inline-block; width:15px; height:15px; background-color:blue; border:1px solid black;"></span>	SX: Presumed Extirpated
<span style="display:inline-block; width:15px; height:15px; background-color:lightblue; border:1px solid black;"></span>	SH: Possibly Extirpated
<span style="display:inline-block; width:15px; height:15px; background-color:red; border:1px solid black;"></span>	S1: Critically Imperiled
<span style="display:inline-block; width:15px; height:15px; background-color:orange; border:1px solid black;"></span>	S2: Imperiled
<span style="display:inline-block; width:15px; height:15px; background-color:yellow; border:1px solid black;"></span>	S3: Vulnerable
<span style="display:inline-block; width:15px; height:15px; background-color:lightgreen; border:1px solid black;"></span>	S4: Apparently Secure
<span style="display:inline-block; width:15px; height:15px; background-color:green; border:1px solid black;"></span>	S5: Secure
<span style="display:inline-block; width:15px; height:15px; background-color:gray; border:1px solid black;"></span>	Not Ranked/Under Review (SNR/SU)

## Conservation Status Not Applicable (SNA)

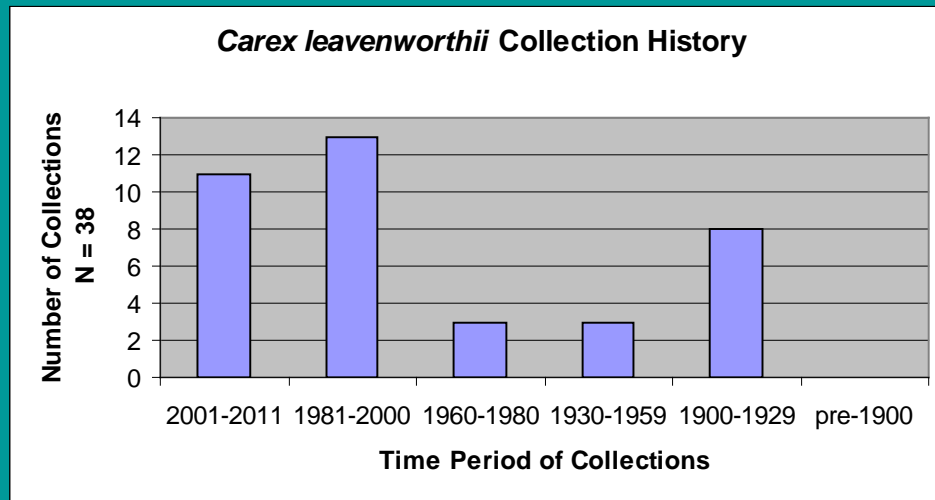
<span style="display:inline-block; width:15px; height:15px; background-color:lightpink; border:1px solid black;"></span>	Exotic
<span style="display:inline-block; width:15px; height:15px; background-color:lightgray; border:1px solid black;"></span>	Hybrid without Conservation Value

NatureServe. 2011. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>.



# Collection history is, well interesting

- Early collections:
- 1901 “Massachussetts Avenue extension, Washington, DC” E. S. Steele (US)
- 1906 “introduced into new lawns, Washington, DC” C. F. Wheeler (US)
- 1914 “12<sup>th</sup> Street, Mall, City” E. S. Steele (US)



# Adventive or native and just extremely adaptable?

- Maryland distribution continues to expand and occurrences have been highly predictable.
- Added two more counties to the Maryland distribution from 2010-2011; Dorchester and Queen Anne's.

**FLORA OF MARYLAND**

Tawes Herbarium, Department of Natural Resources, Annapolis Maryland

Carex leavenworthii Dewey

**Date.** 23 May 2010

**Loc.** Coastal Plain, Talbot County, Town of Easton, lawns surrounding the Presbyterian Church at 617 North Washington Street.  
Frequent.

**Habitat.** Lawn.


**Coll.** Christopher T. Frye 5936



# Sedge collecting by bicycle



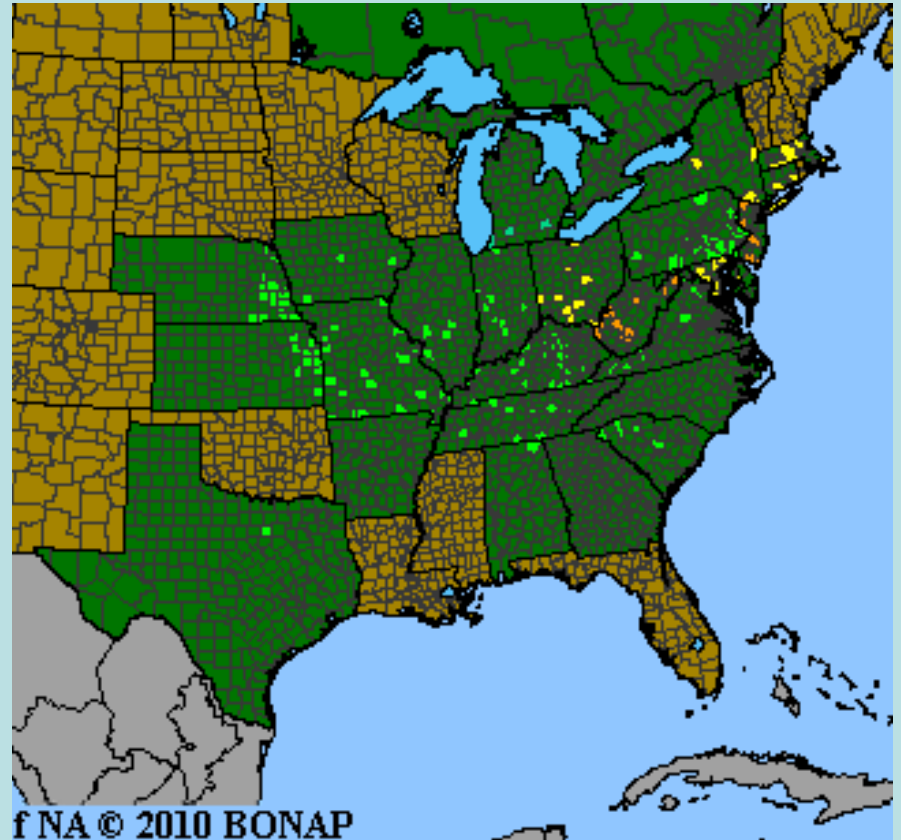
# Mode of Dispersal?

 <b>GRASS SEED</b>	
Pure Seed	Germination
19.50% "Midnight" Kentucky Bluegrass	95%
29.25% "Serene" Kentucky Bluegrass	95%
29.25% "Manhattan" Perennial Ryegrass	90%
19.50% Creeping Red Fescue	80%
<b>Other Ingredients</b>	
0.50% Other Crop Seed	
1.80% Inert Matter	
0.20% Weed Seed	
<b>Net Wt. 50lbs. (22.68 kg)</b>	
<b>Tested: January 2000</b>	
<b>Lot No. WW112-003</b>	

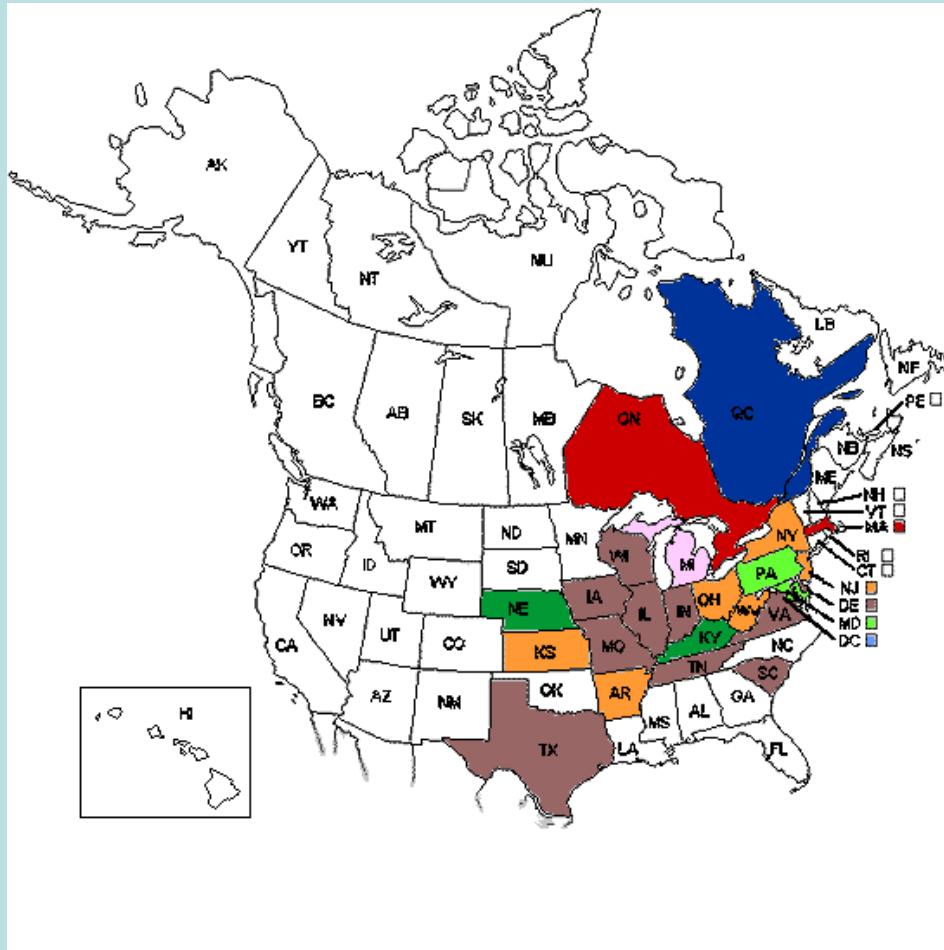


# *Carex mesochorea* Mackenzie

- Once considered an Endangered Species.
- Associated with dry woodlands and glades.



# Conservation ranks for *C. mesochorea*



## State/Province Conservation Status

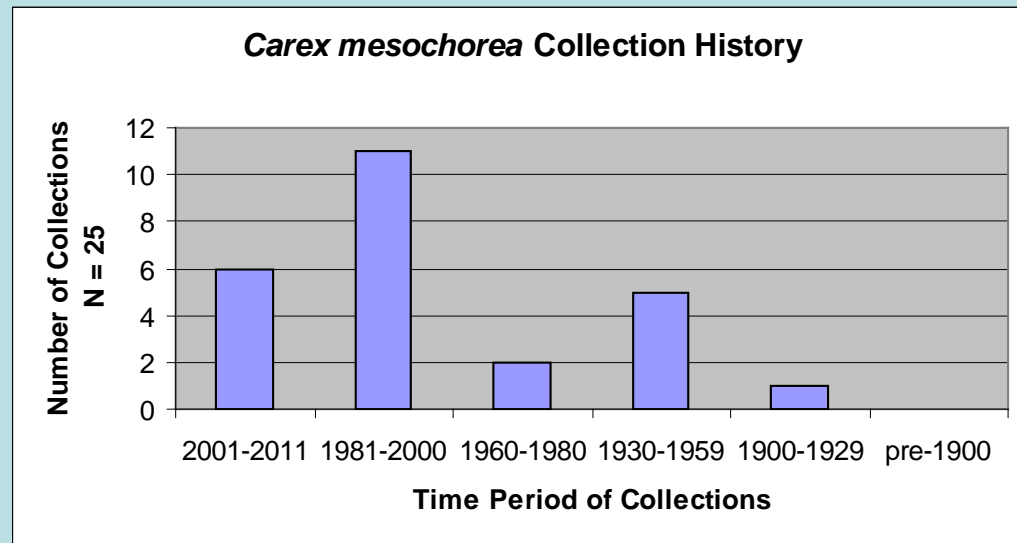
- SX: Presumed Extirpated
- SH: Possibly Extirpated
- S1: Critically Imperiled
- S2: Imperiled
- S3: Vulnerable
- S4: Apparently Secure
- S5: Secure
- Not Ranked/Under Review (SNR/SU)

## Conservation Status Not Applicable (SNA)

- Exotic
- Hybrid without Conservation Value

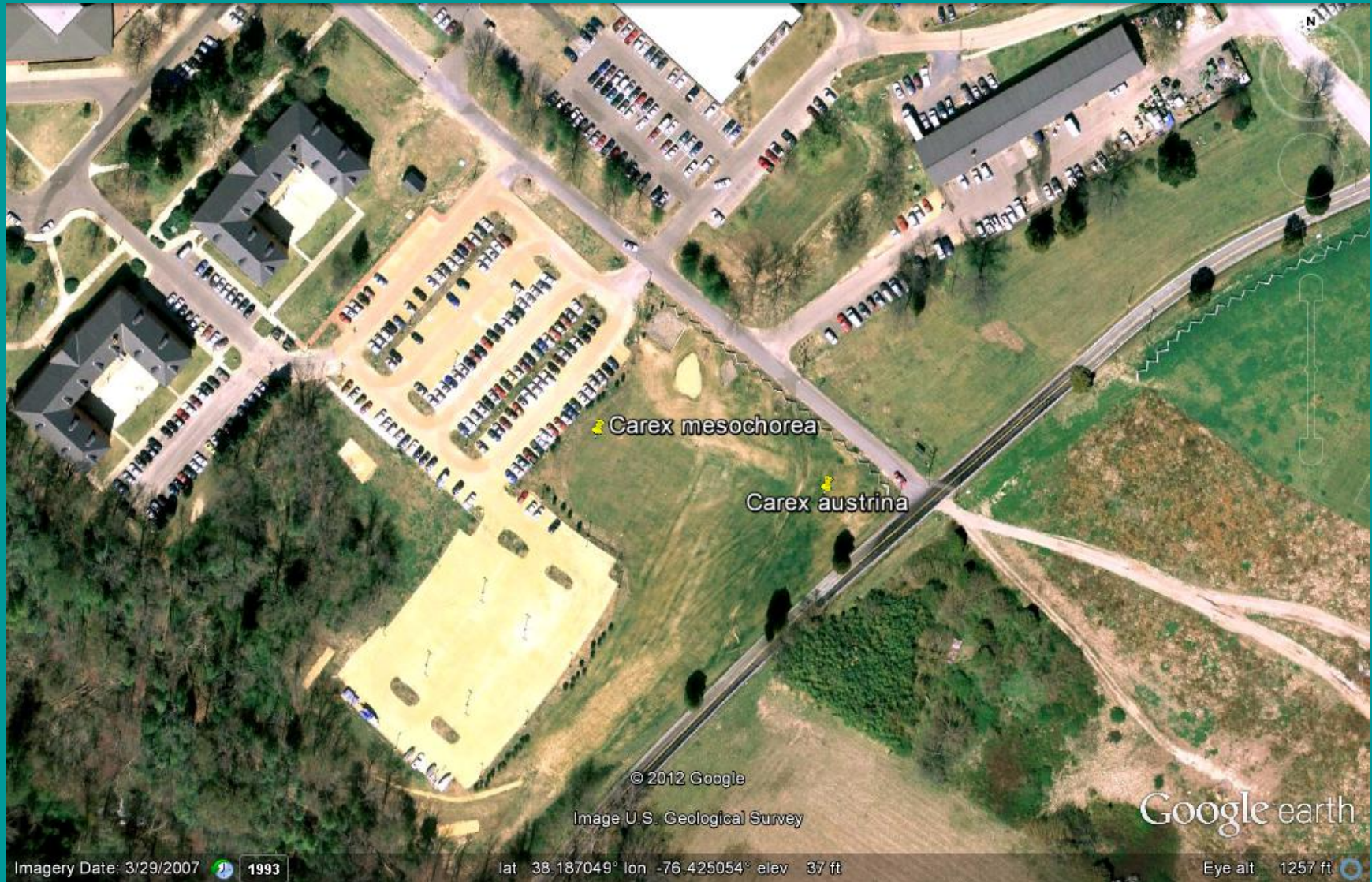
# Adventive or native and just extremely adaptable?

- Early collections are few and often vague.
- 1900 “College Park”
- 1940 “Catoctin Recreation Area above falls”
- 1950 “lawn, back of Smithsonian”






# Predictability ~ 40%





A satellite map of a coastal region, likely in the Chesapeake Bay area. A large white polygon with a red border is overlaid on the map, covering a significant portion of the land. The text "Carex aggregata" is written in black font within this white area. The map shows green land, blue water, and a white outline of the coastline. There are several small circular markers on the map, including one near the bottom right corner and another near the top right corner.

*Carex aggregata*



A satellite map of a coastal region, likely in the United States. A large white polygon is overlaid on the land, with a red boundary line. The text "Carex leavenworthii" is placed within the white area. The map shows a coastline with a large body of water to the right and a river or inlet at the bottom. A north arrow is in the top right corner. Various data and copyright information are at the bottom.

*Carex leavenworthii*

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Image © 2012 TerraMetrics  
© 2012 Google

Google earth

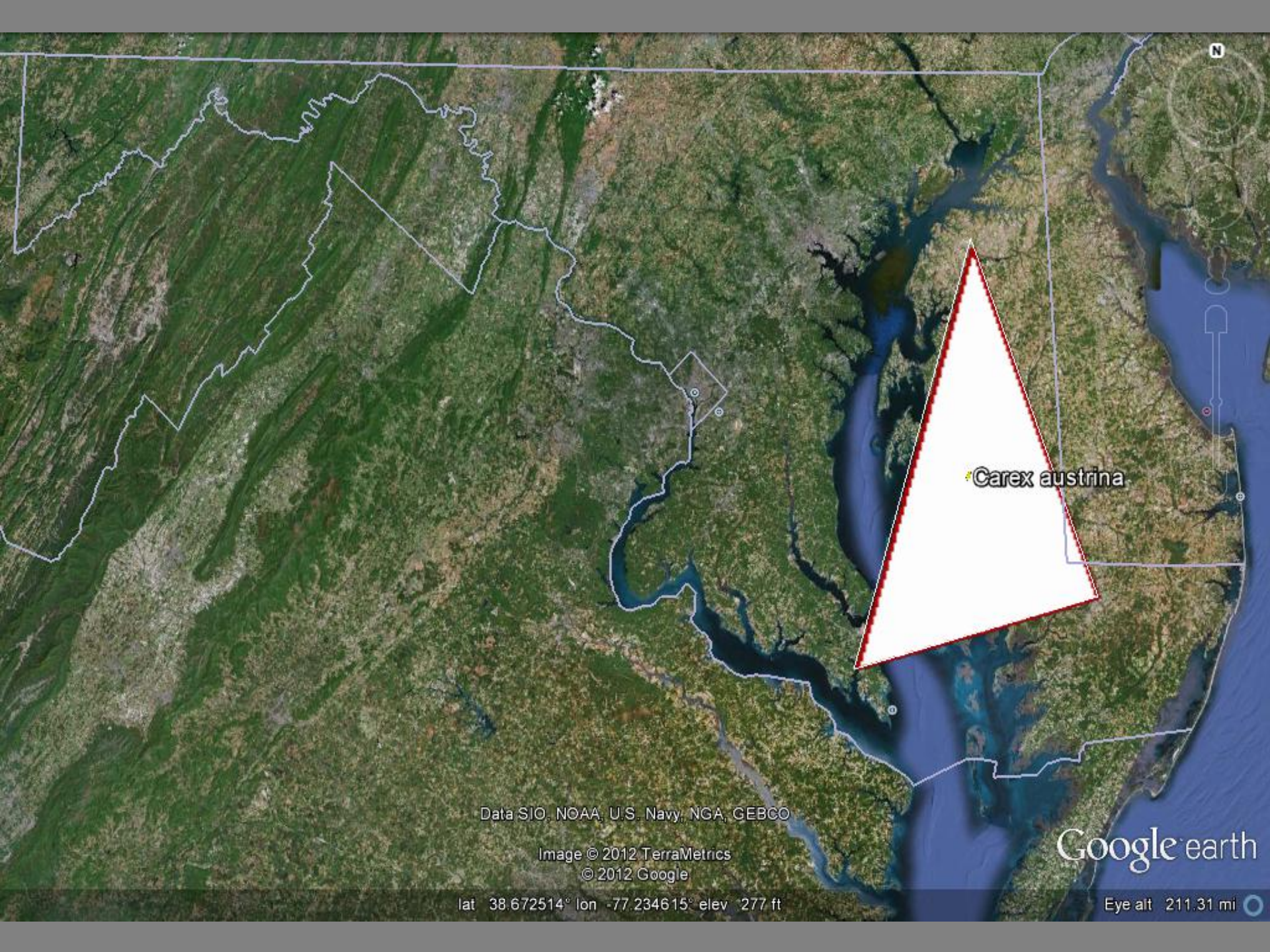
lat 38.858974° lon -77.208575° elev 320 ft

Eye alt 211.32 mi









Carex australis

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

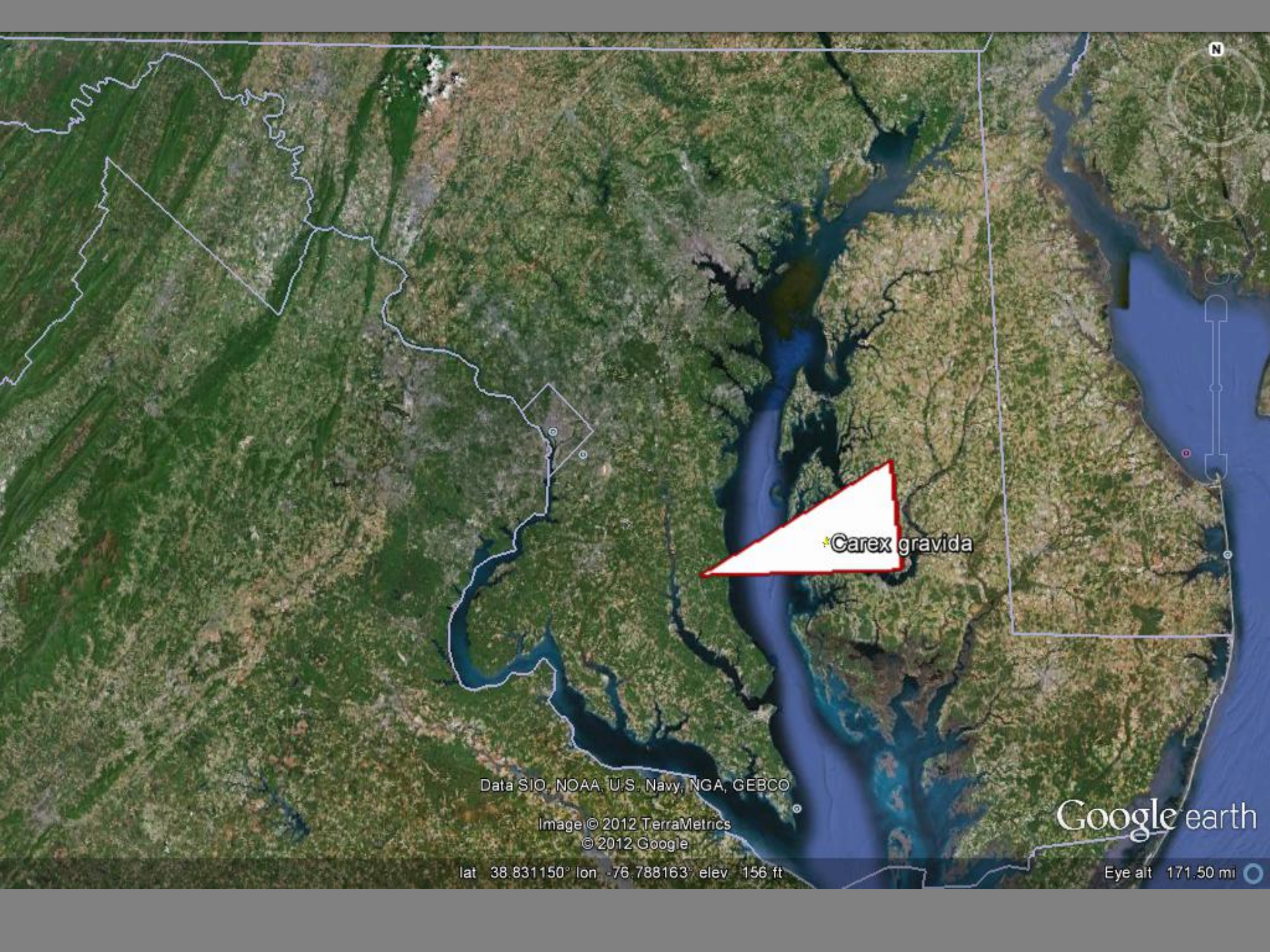
Image © 2012 TerraMetrics  
© 2012 Google

Google earth

lat 38.672514° lon -77.234615° elev 277 ft

Eye alt 211.31 mi





Carex gravida

Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Image © 2012 TerraMetrics  
© 2012 Google

Google earth

lat 38.831150° lon -76.788163° elev 156 ft

Eye alt 171.50 mi



# Building a conceptual model for evaluating conservation ranks. Phylogenetic Context

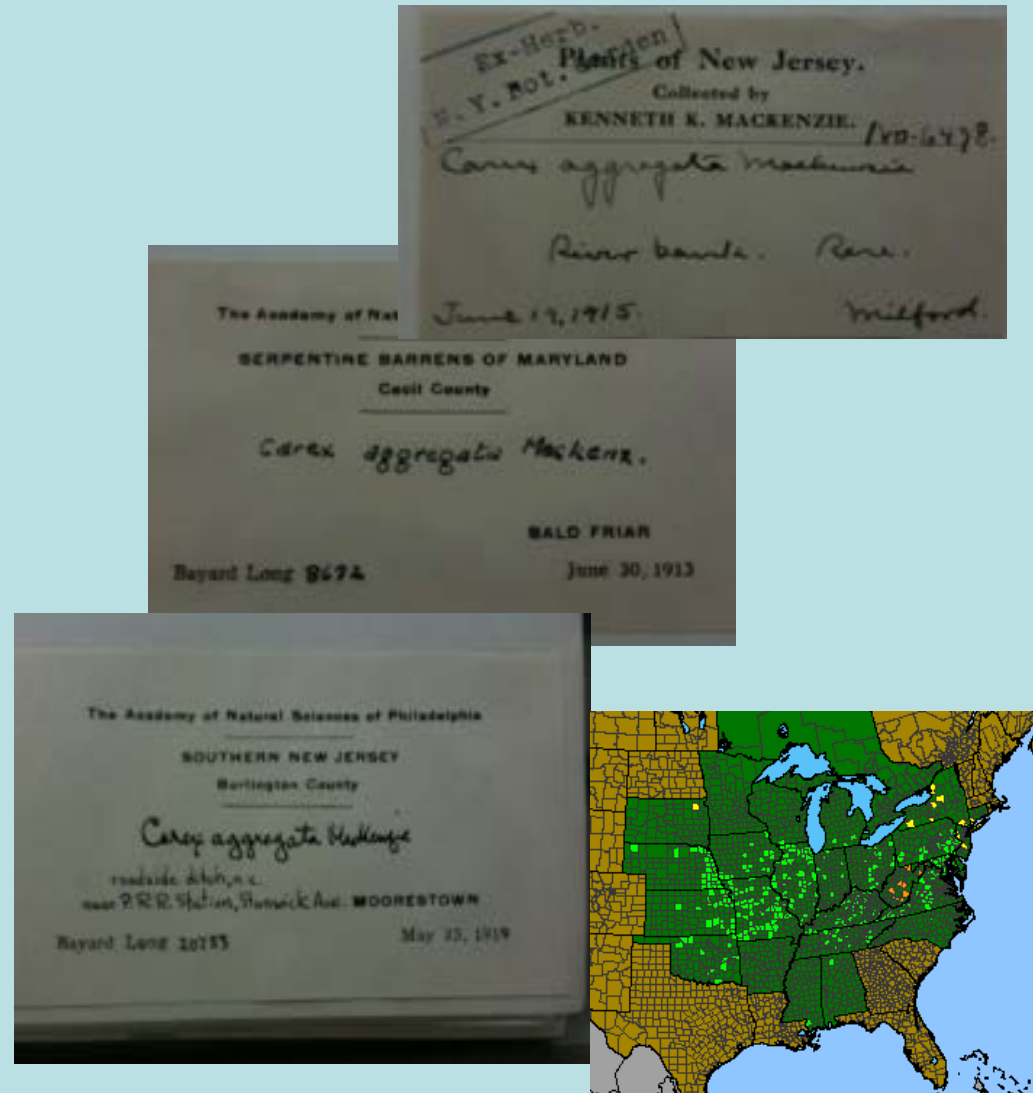


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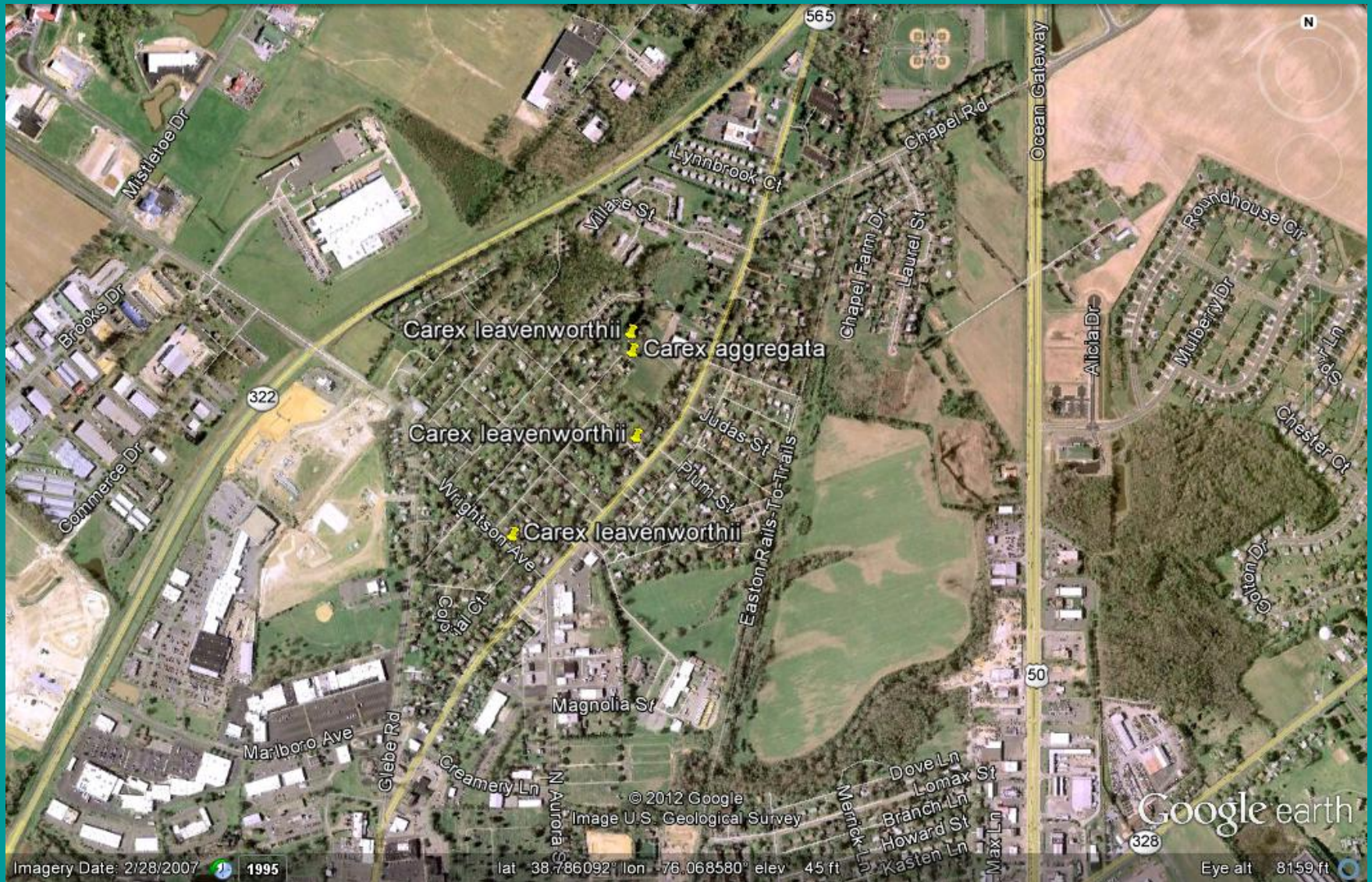
# Historical Context

- Fairly substantial data demands, a few specimens do not tell a story.
- The peripheries of ranges require some explanation as to how the species arrived.





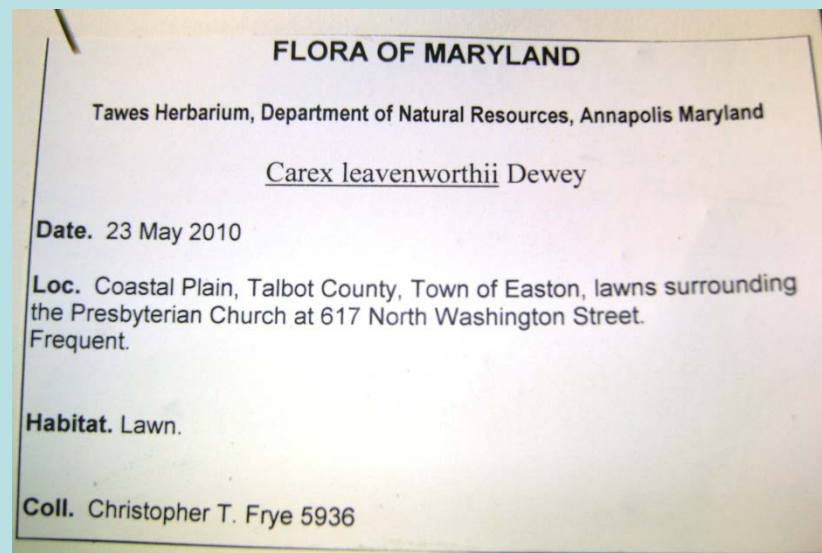
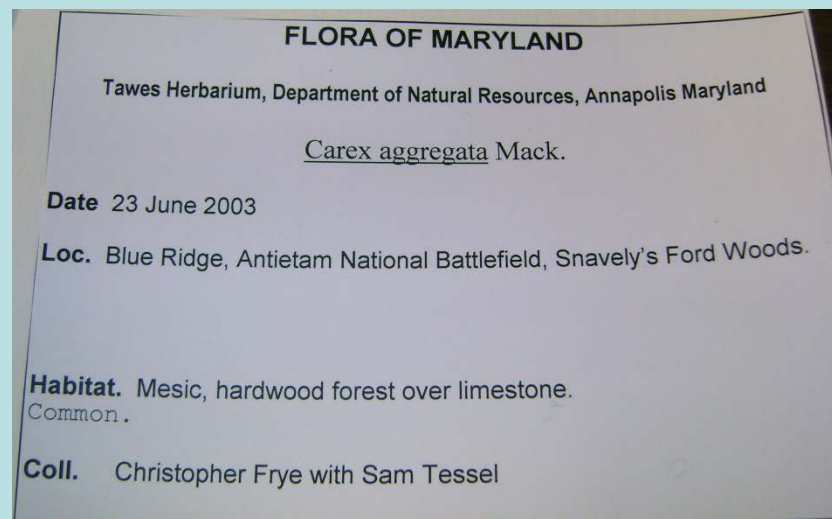
# Current Context





# Developing the Model

- Make some model predictions—these need not be complex.
- Field-truth your model.
- Good questions to ask:
  1. What are the habitats in the core range?
  2. What are the habitats stated on historical collections?
  3. How much of the habitat do you have?



# Teach







Special thanks to: Anton Reznicek, Robert Naczi, Chris Lea, Rod Simmons, and my wife Jennifer who waits patiently on our walks while I look at sedges.