

Fire, Water, Soil and Sea Level Can Influence the Position of Mangrove – Marsh Ecotones Through Time

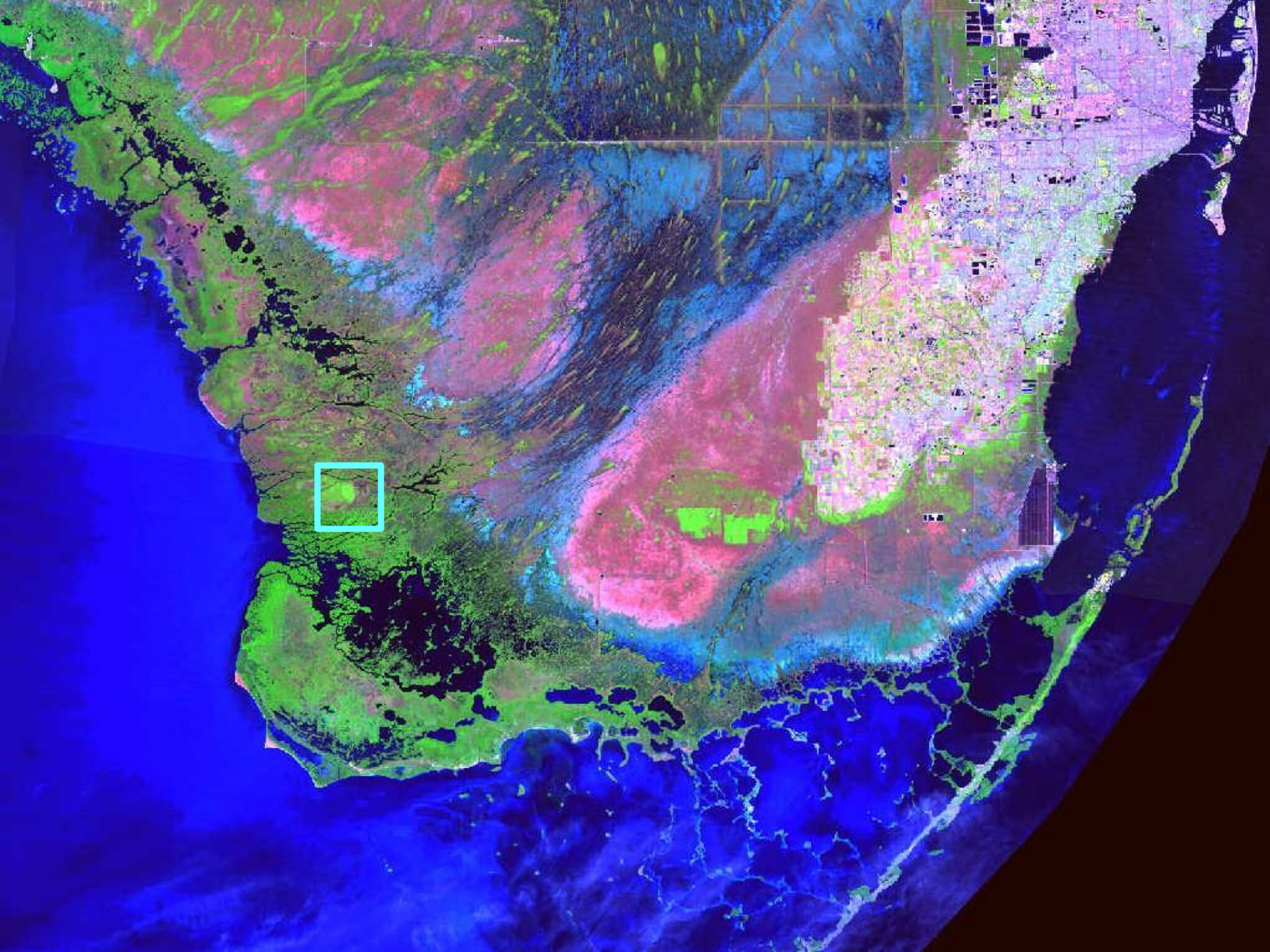
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¹ Southeast Ecological Science Center, USGS, St. Petersburg, FL

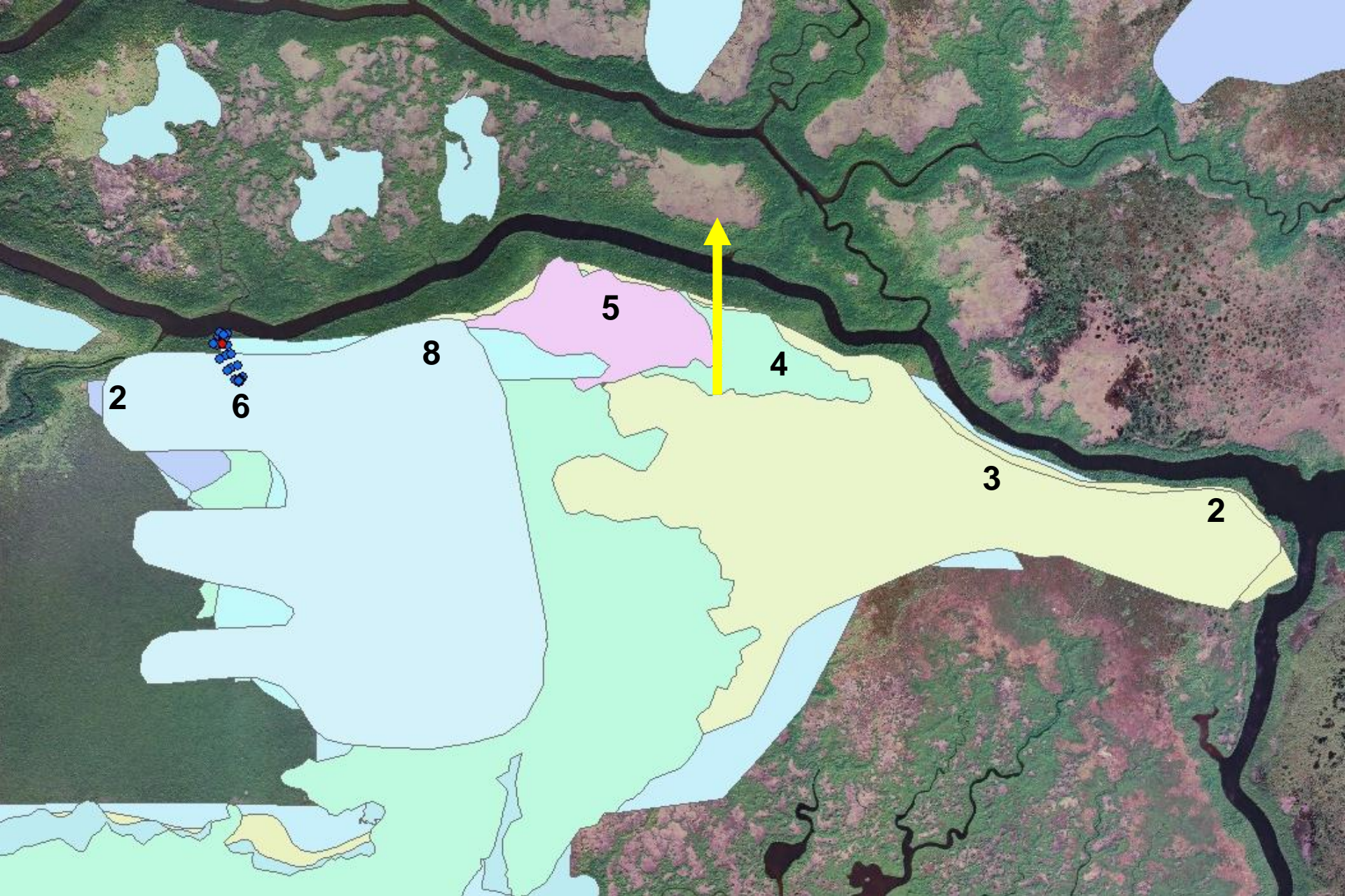
² Southeast Ecological Science Center, USGS, Gainesville, FL

³ Jacobs Technology, Inc., St. Petersburg, FL

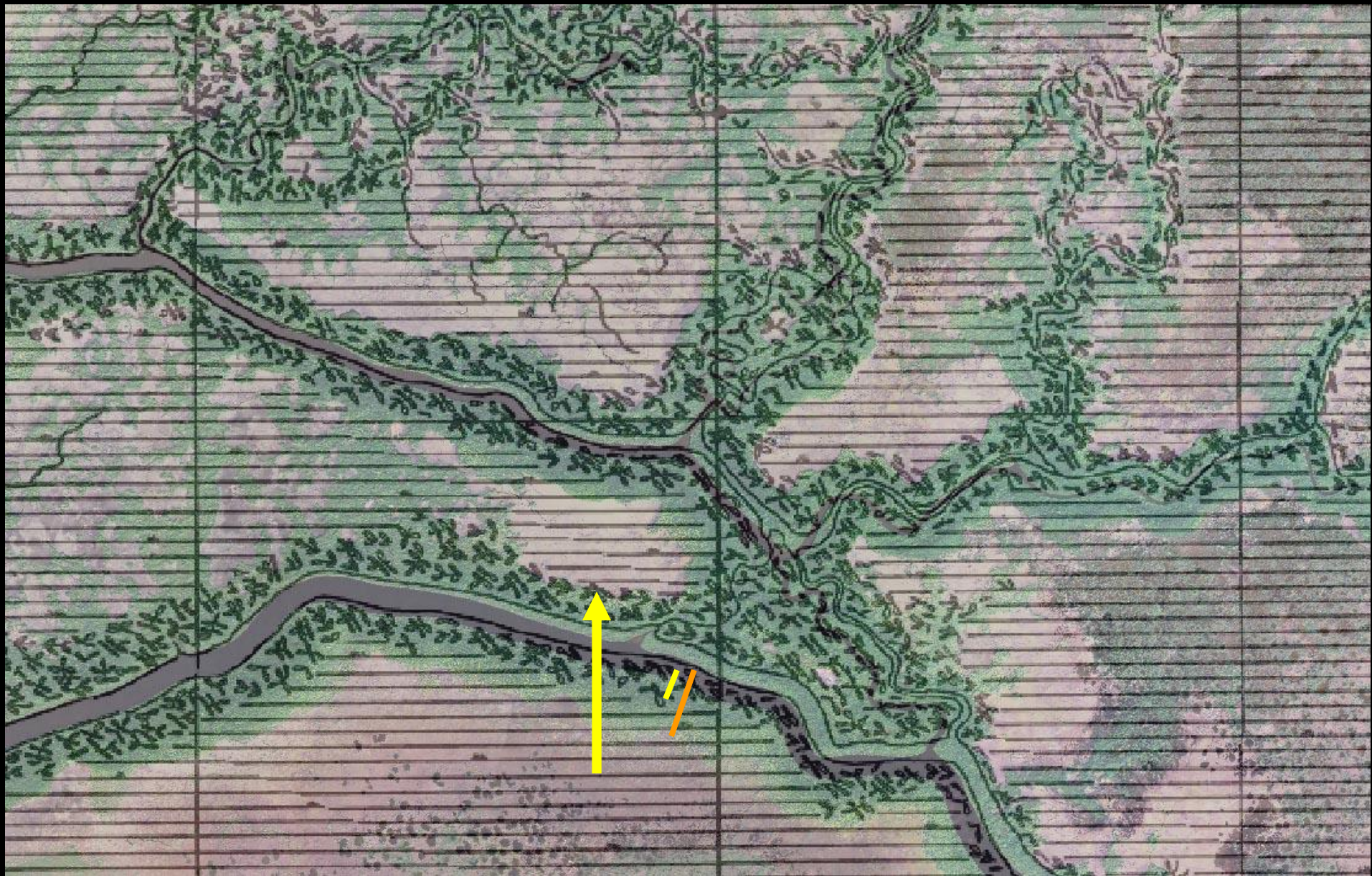
⁴ Eastern Region Geography Team, Reston, VA

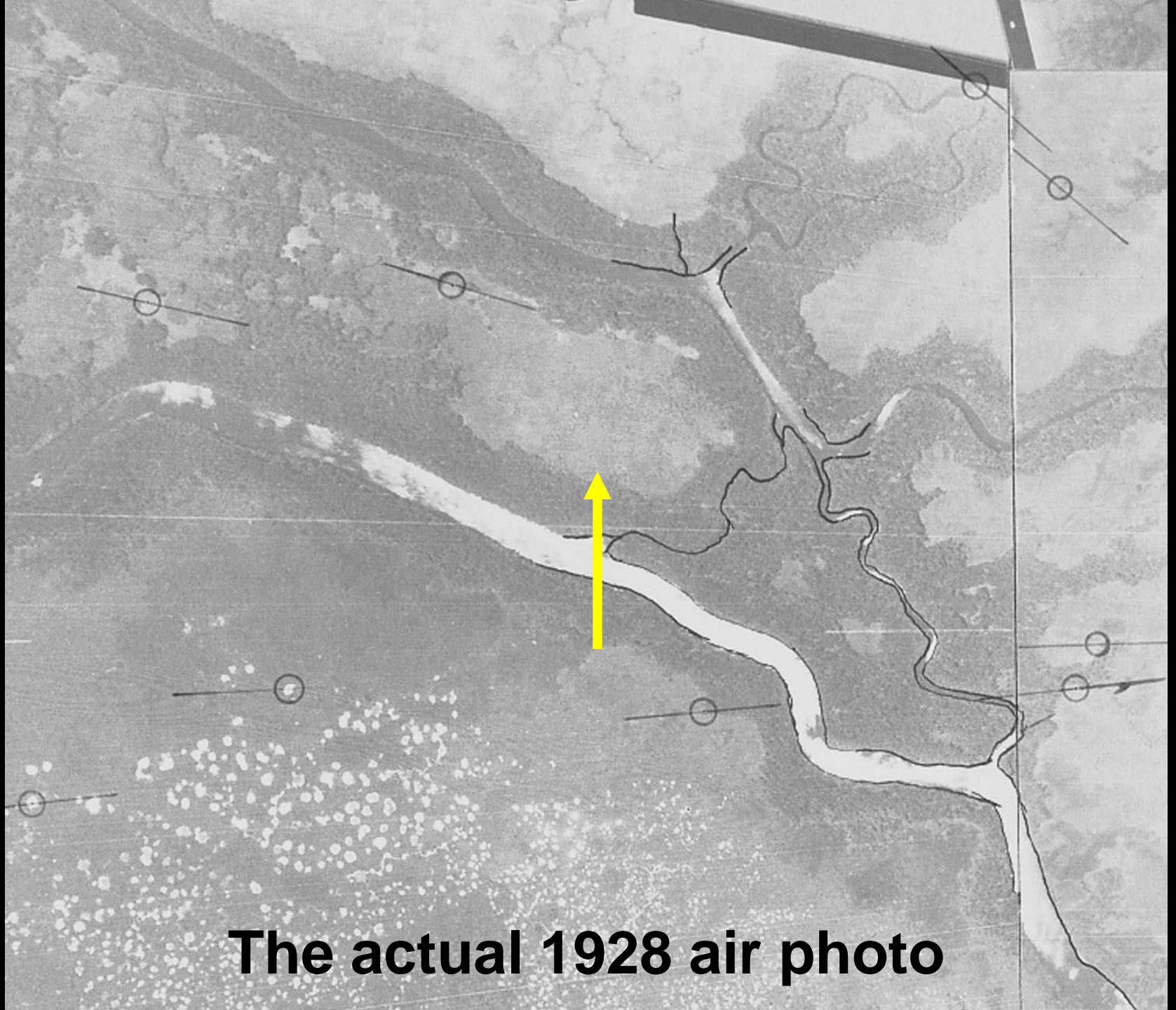












The actual 1928 air photo



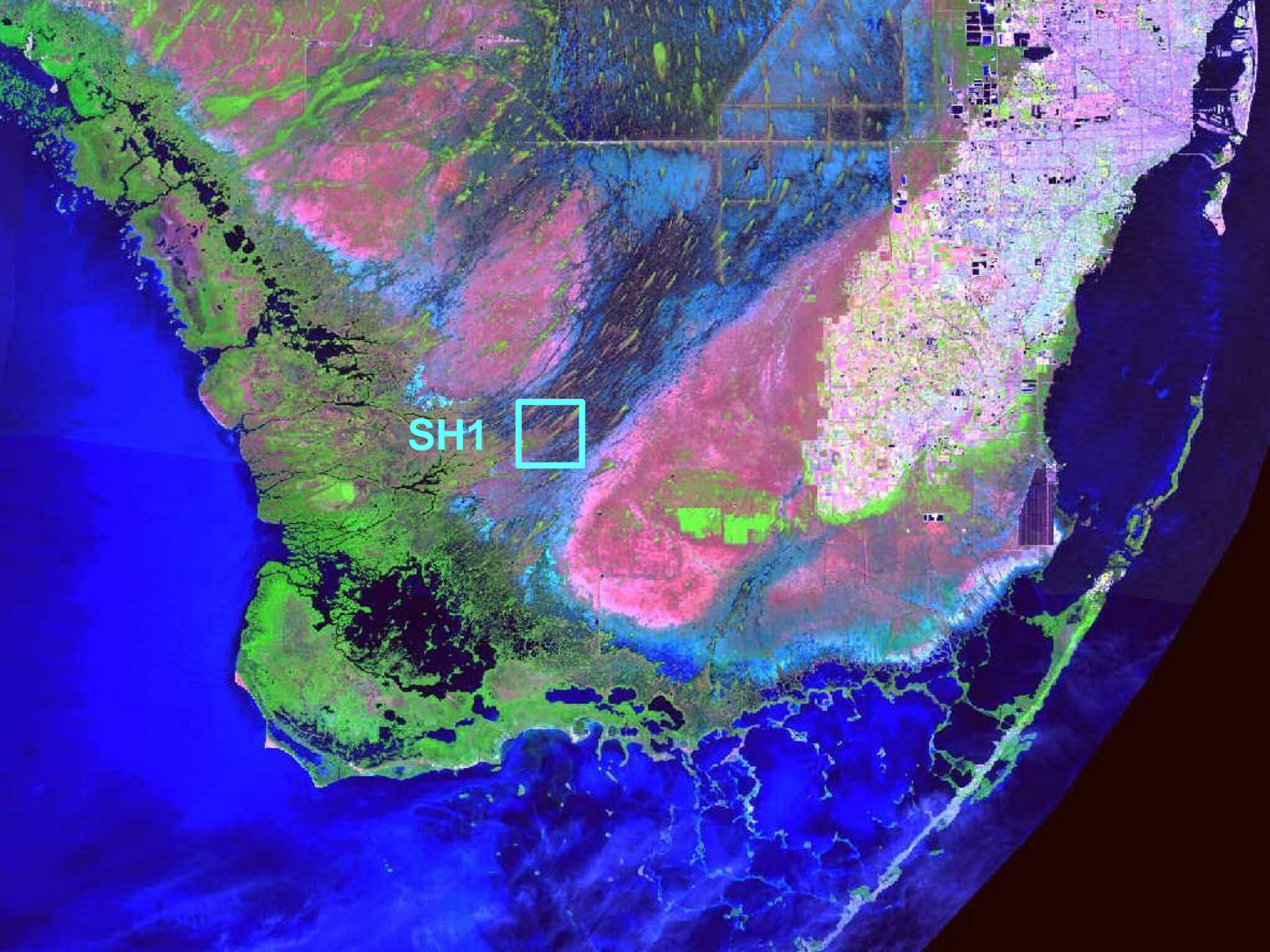
1940 overlay on 2004 DOQQs

An aerial photograph showing a landscape with a river winding through it. The river is surrounded by a dense, green forest. In the foreground, there is a large area of brown, charred ground with sparse, dry vegetation, indicating a recent fire. The background shows a vast, flat expanse of land with a mix of green and brown patches, suggesting a transition zone or ecotone.

An ecotone that has hardly shifted and never burned.

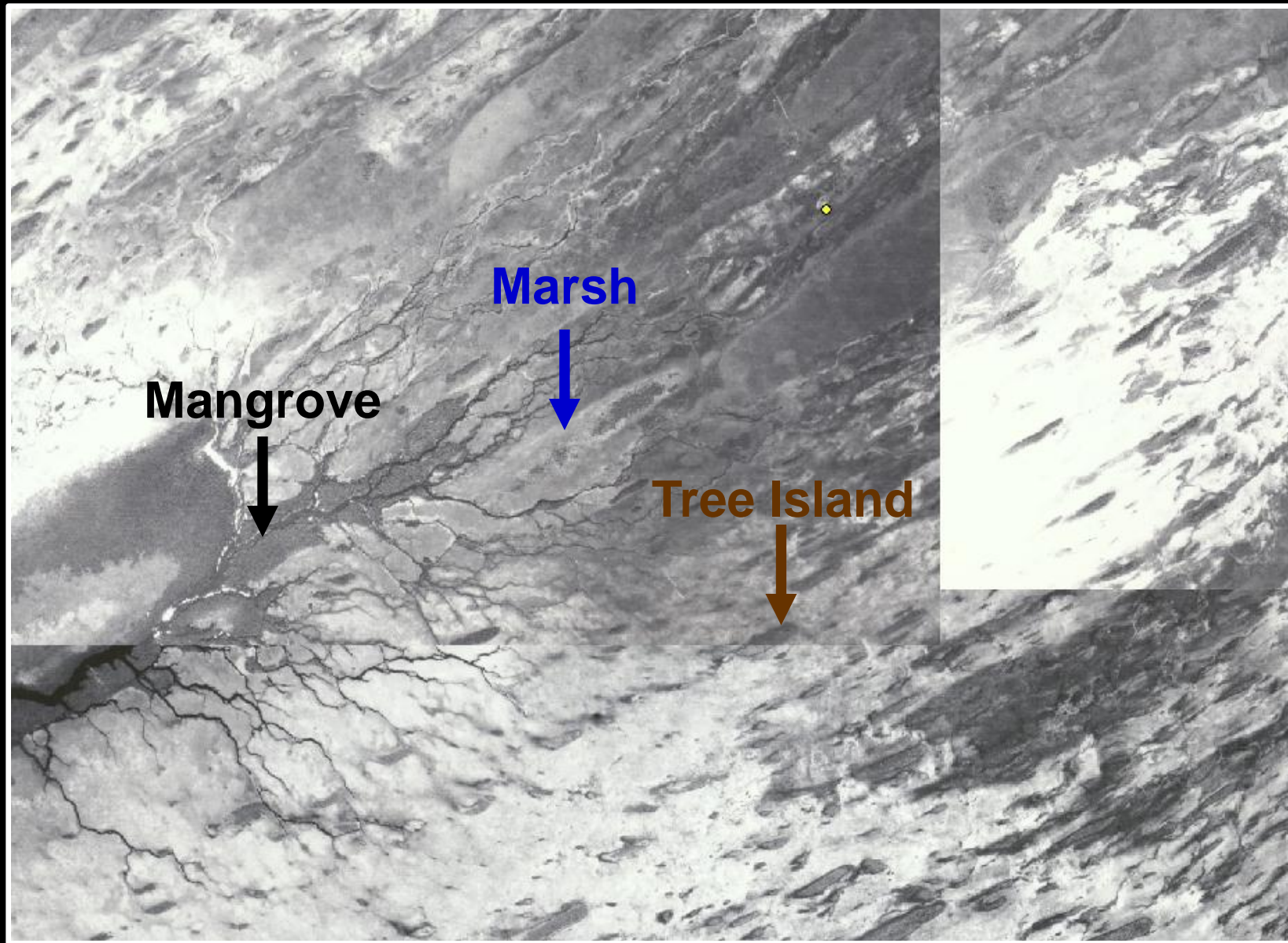
And one that has shifted and burned.

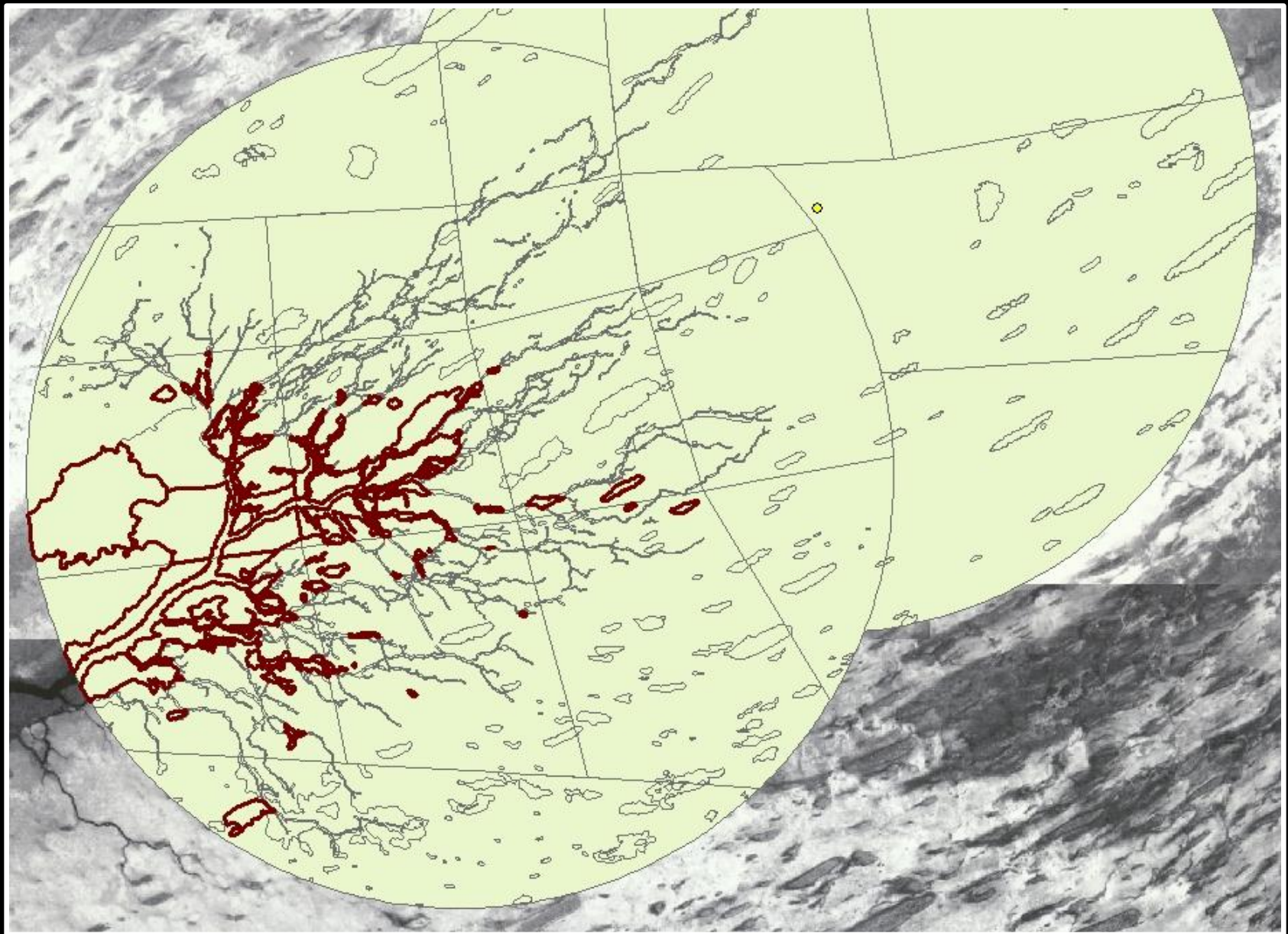
Maybe fire is NOT that important as a control.

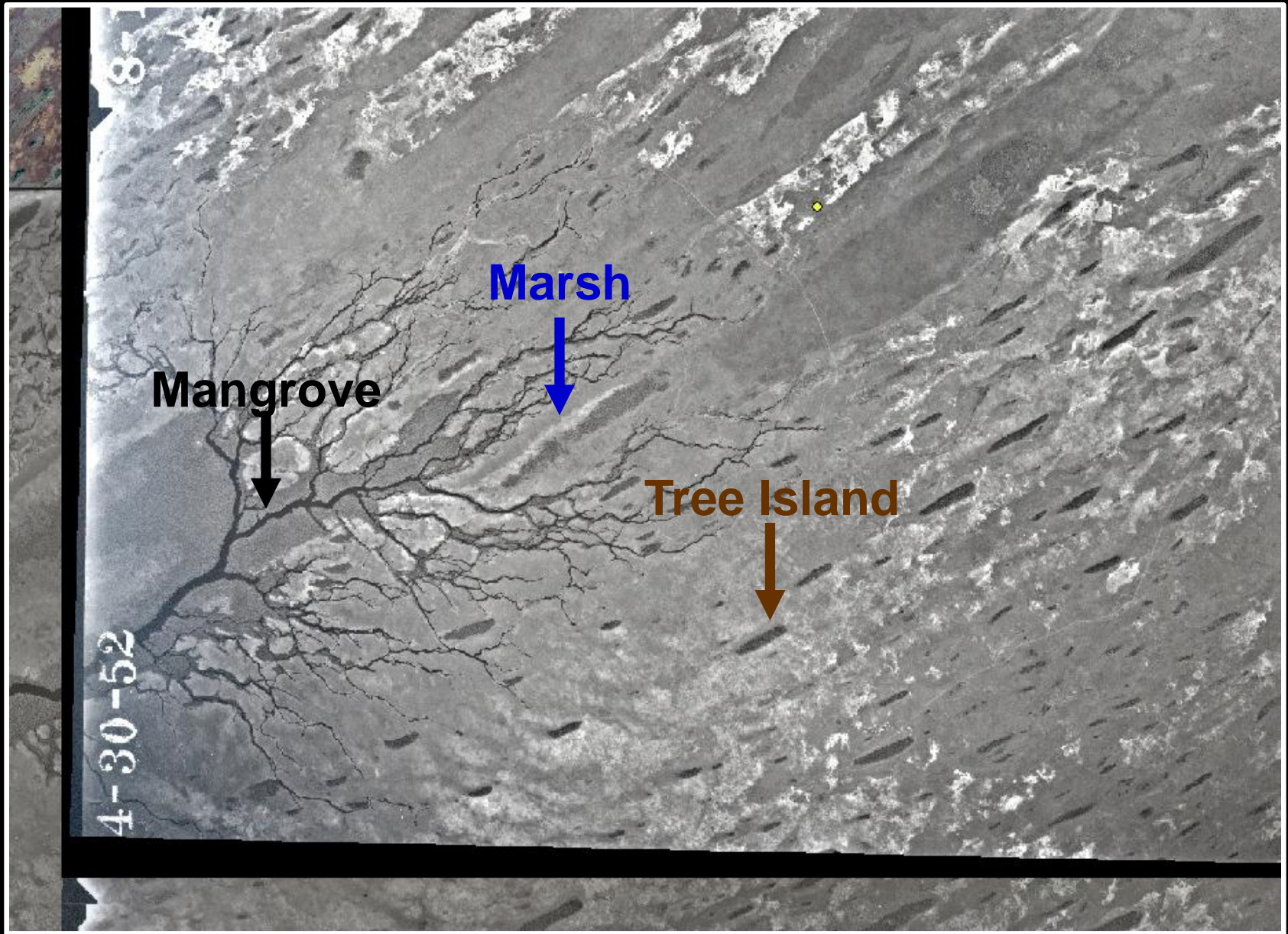


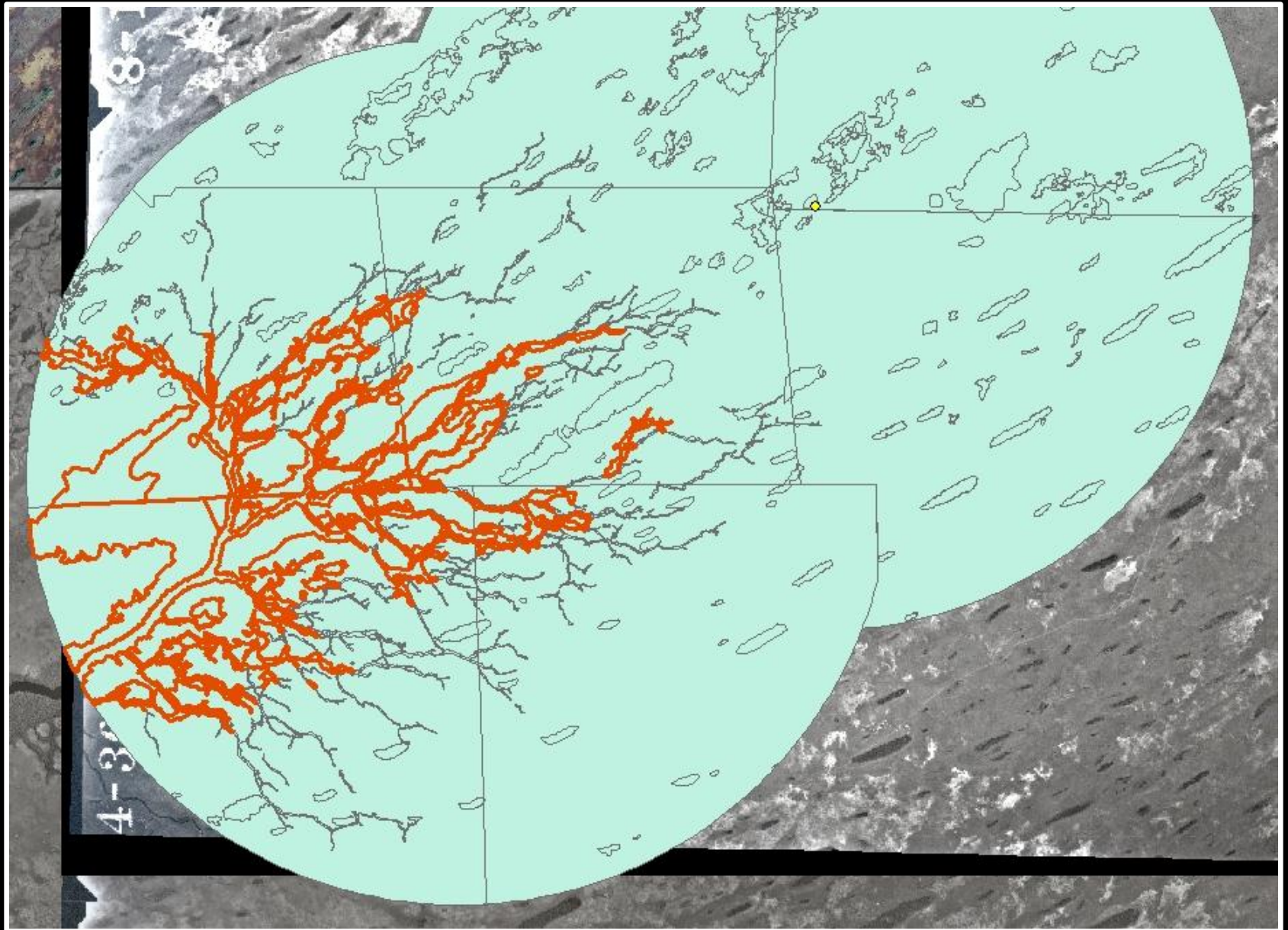
SH1

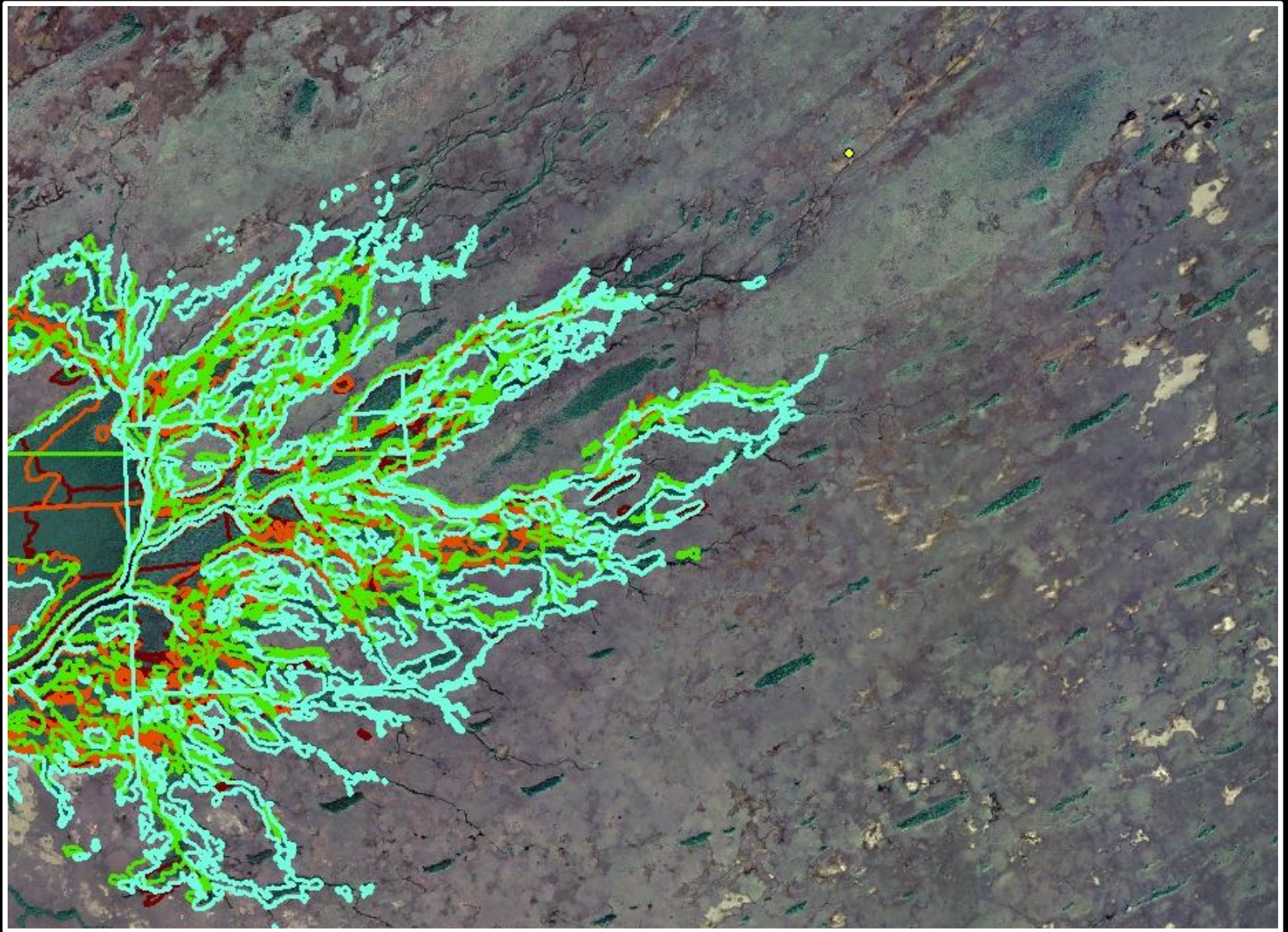


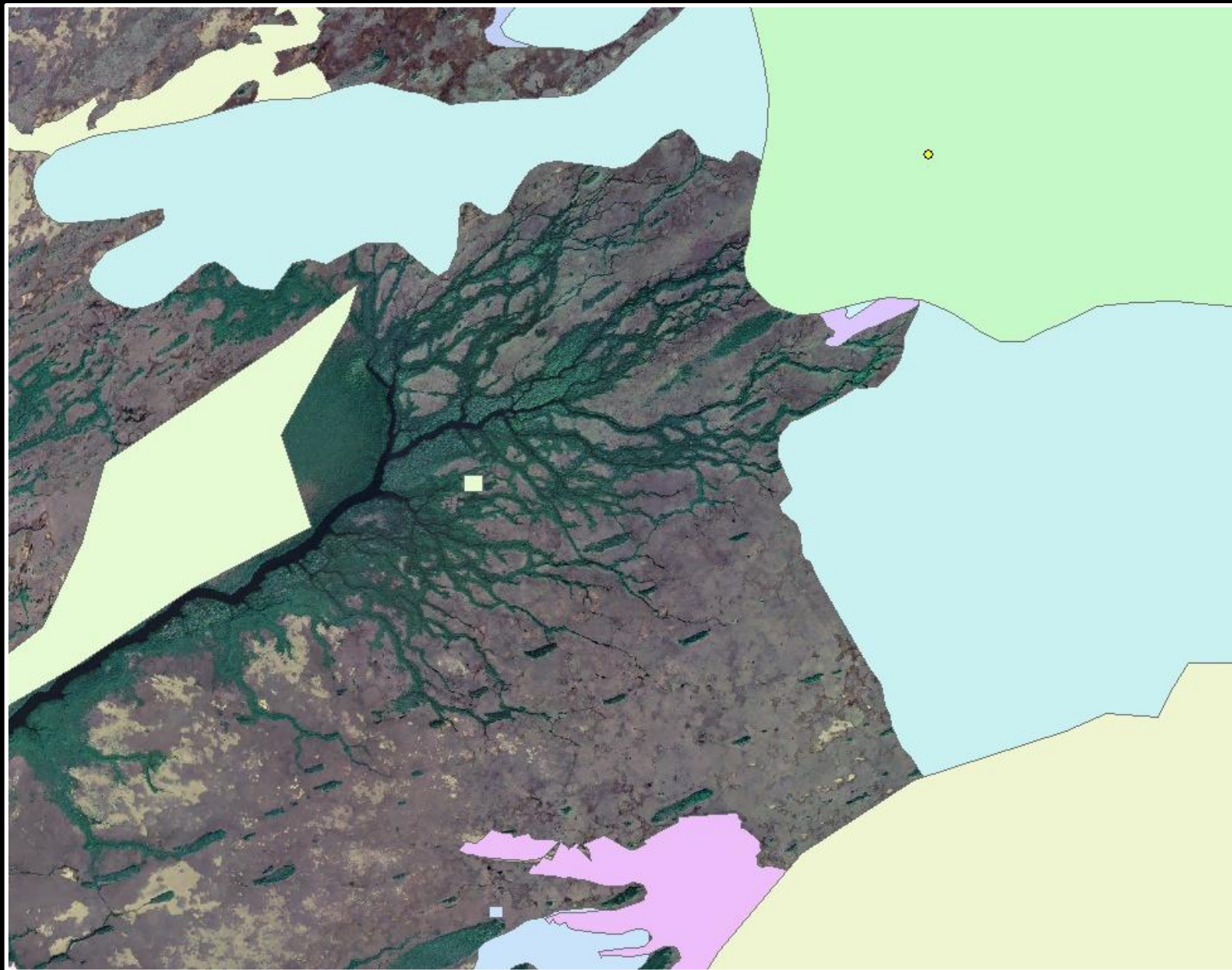








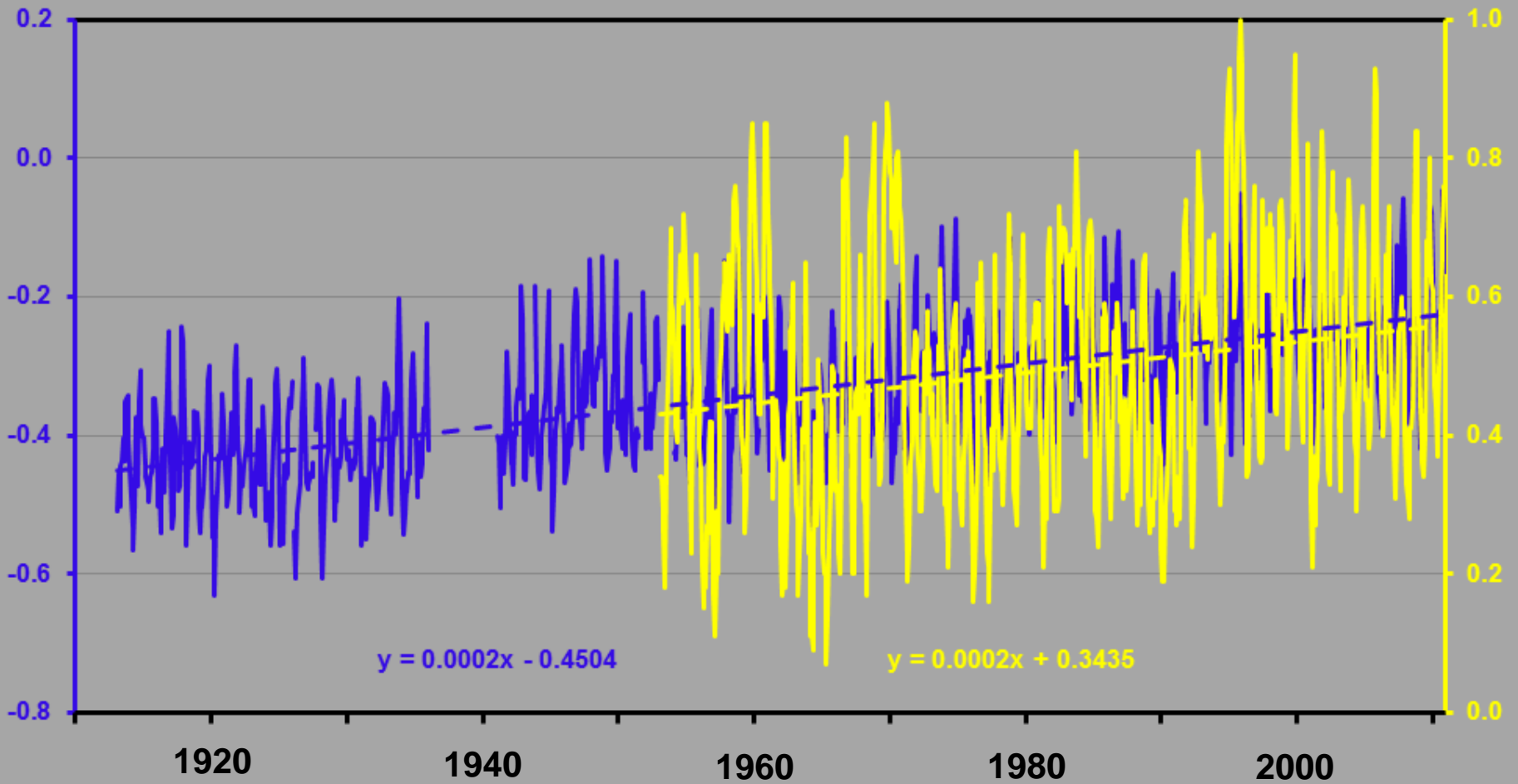




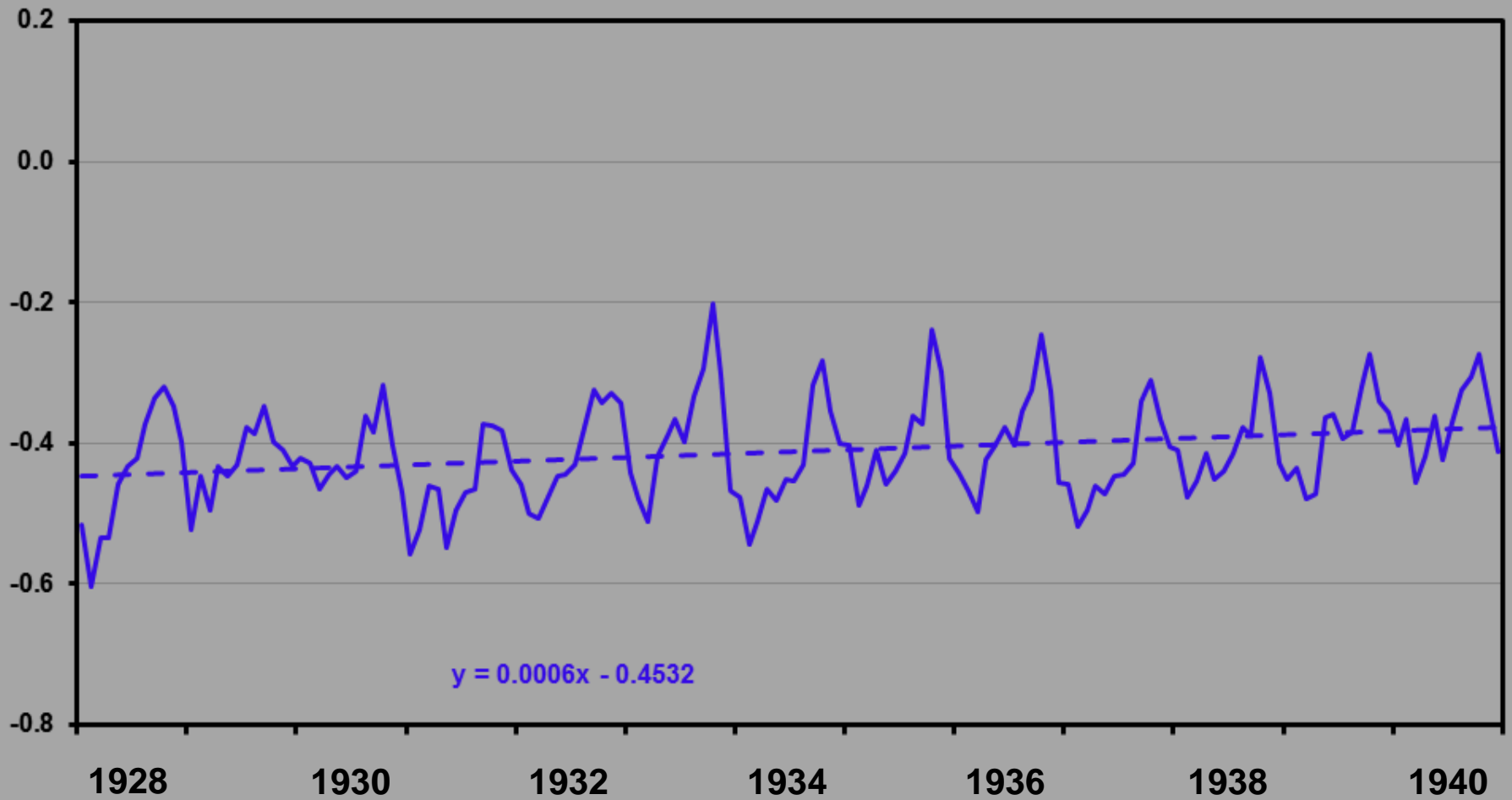
Not much to burn:
Sparse Eleocharis and Cladium



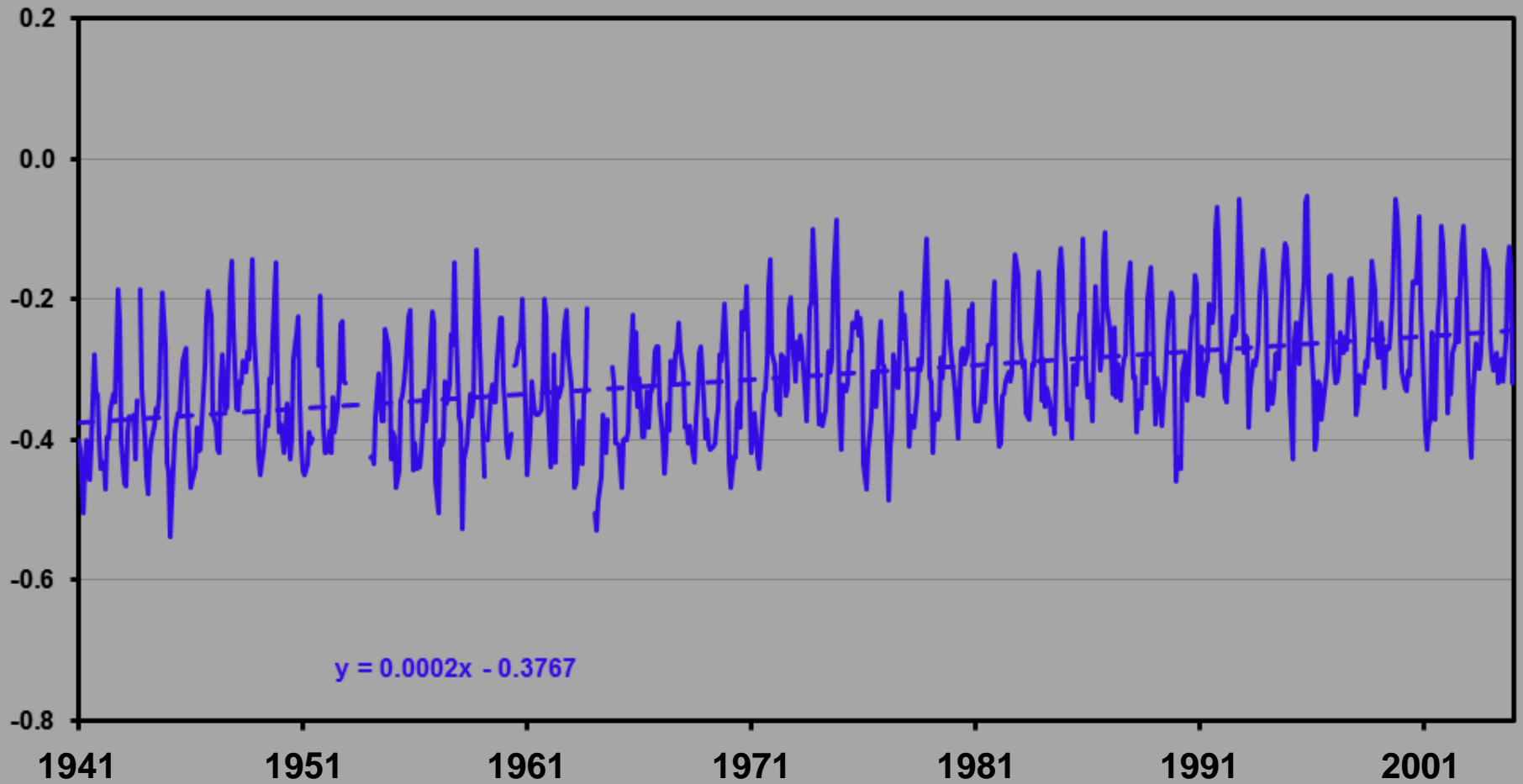
Key West Sea Level and P35 Water Level



Key West Sea Level: 1928 - 1940



Key West Sea Level: 1941 - 2004



Compare rates of Key West SLR

1928 – 1940: Period of rapid mangrove expansion

KW SLR: 0.0006 m•yr⁻¹

1941 – 2004: Period of little mangrove expansion

KW SLR: 0.0002 m•yr⁻¹

Sea level rise had a pronounced effect early, but not later, in the record.

A current emphasis of our work is factoring in the role of soils in ecotone dynamics







Andrew, 8/92

Freeze, 1/98

Fire, 8/01

**Many factors acting at the mangrove – marsh
ecotones**



**What about future
climate change
impacts
???**

**Results from down-scaled, global
climate models, indicate that....**

JJA

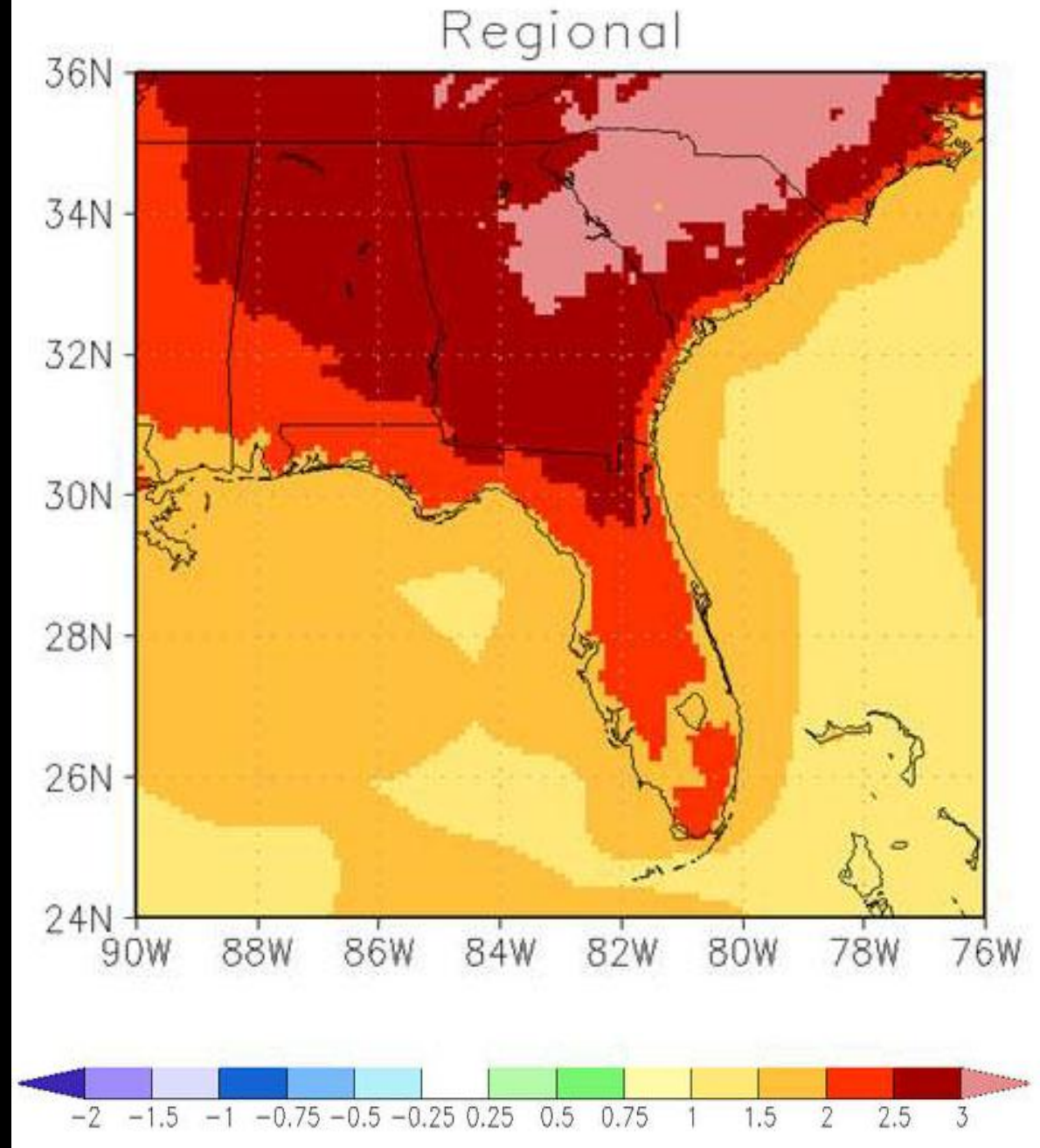
2040-2070

Down scaled
Temperature

From

CCSM3

HOTTER



JJA

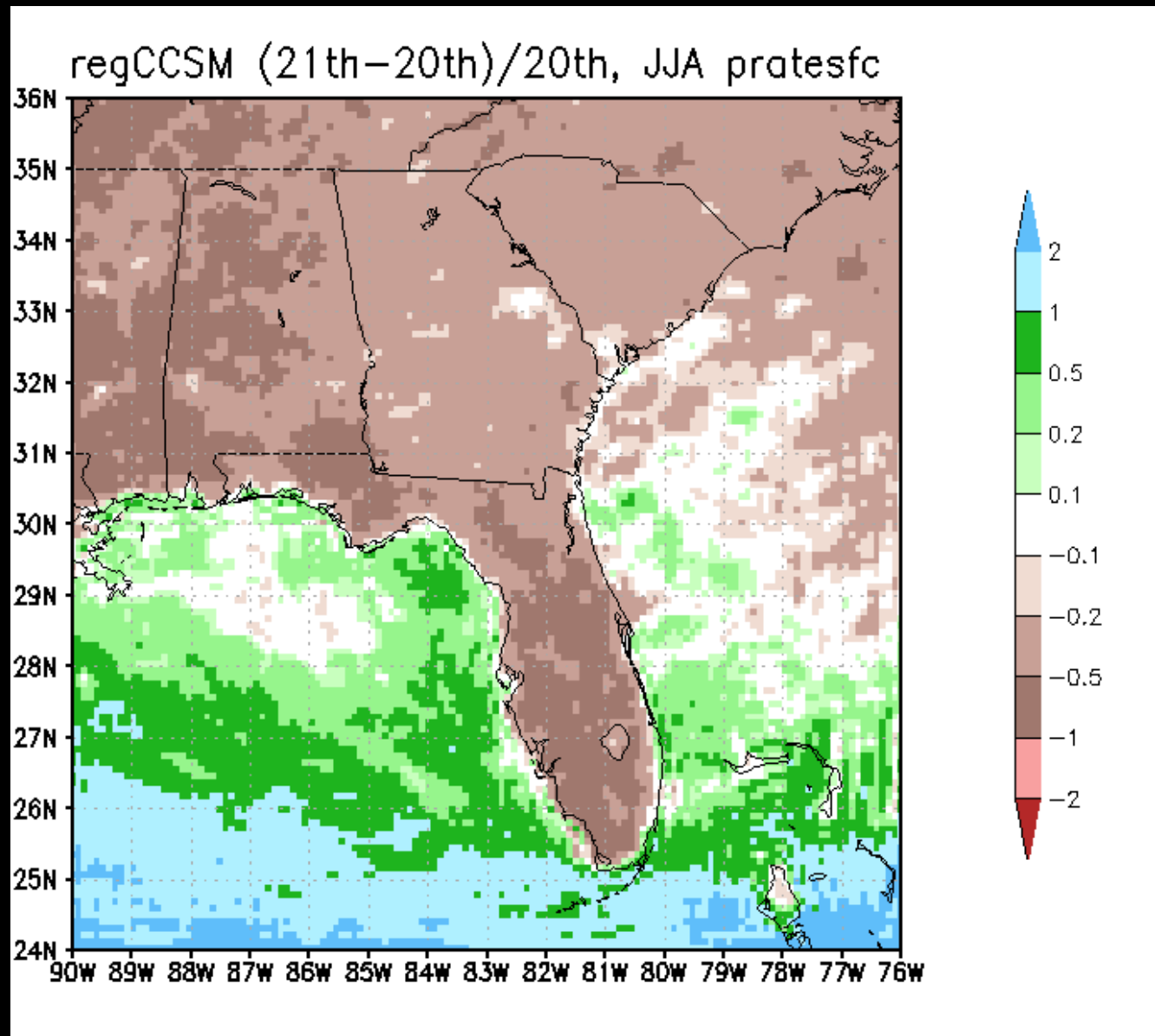
2040-2070

Down
scaled

Fractional
Change in
Rainfall

CCSM3

DRYER



La Florida
becomes
El Desierto
??

Does
HOTTER
&
DRYER

=

More Fires ??

ACKNOWLEDGEMENTS



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