

Evaluating tradeoffs in ecosystem (dis)services: addressing spatial scale

Archbold Biological Station-University Florida LTAR



Archbold Biological Station/MAERC

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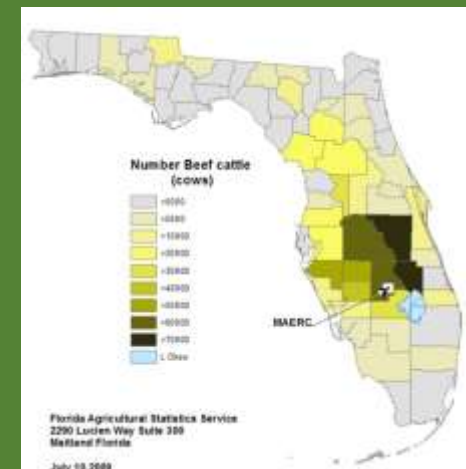
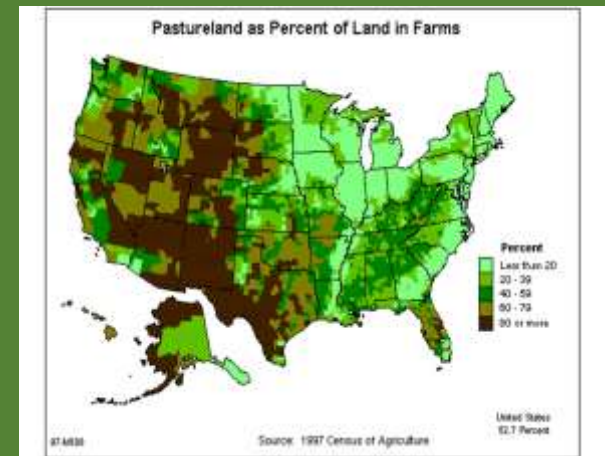
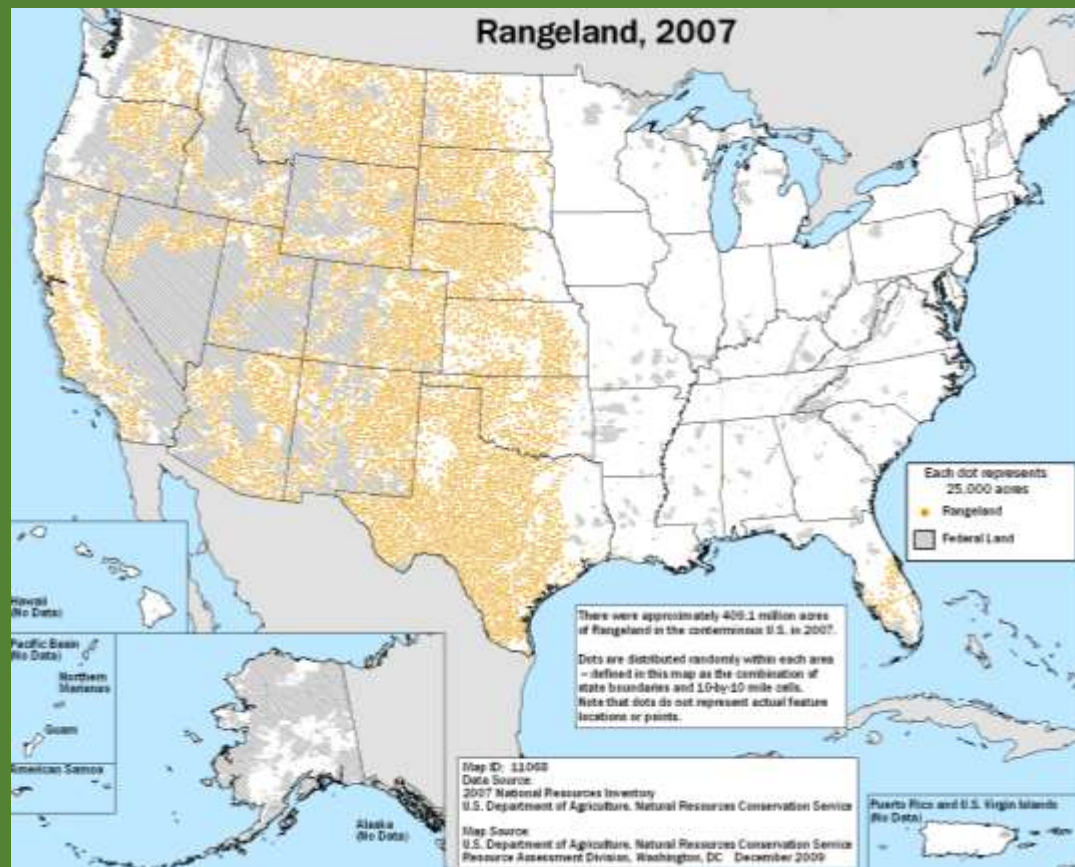
Raoul Boughton (Wildlife
& Conservation)
Maria Silveira (Soil Science)



USDA ARS Tifton
Alissa Coffin



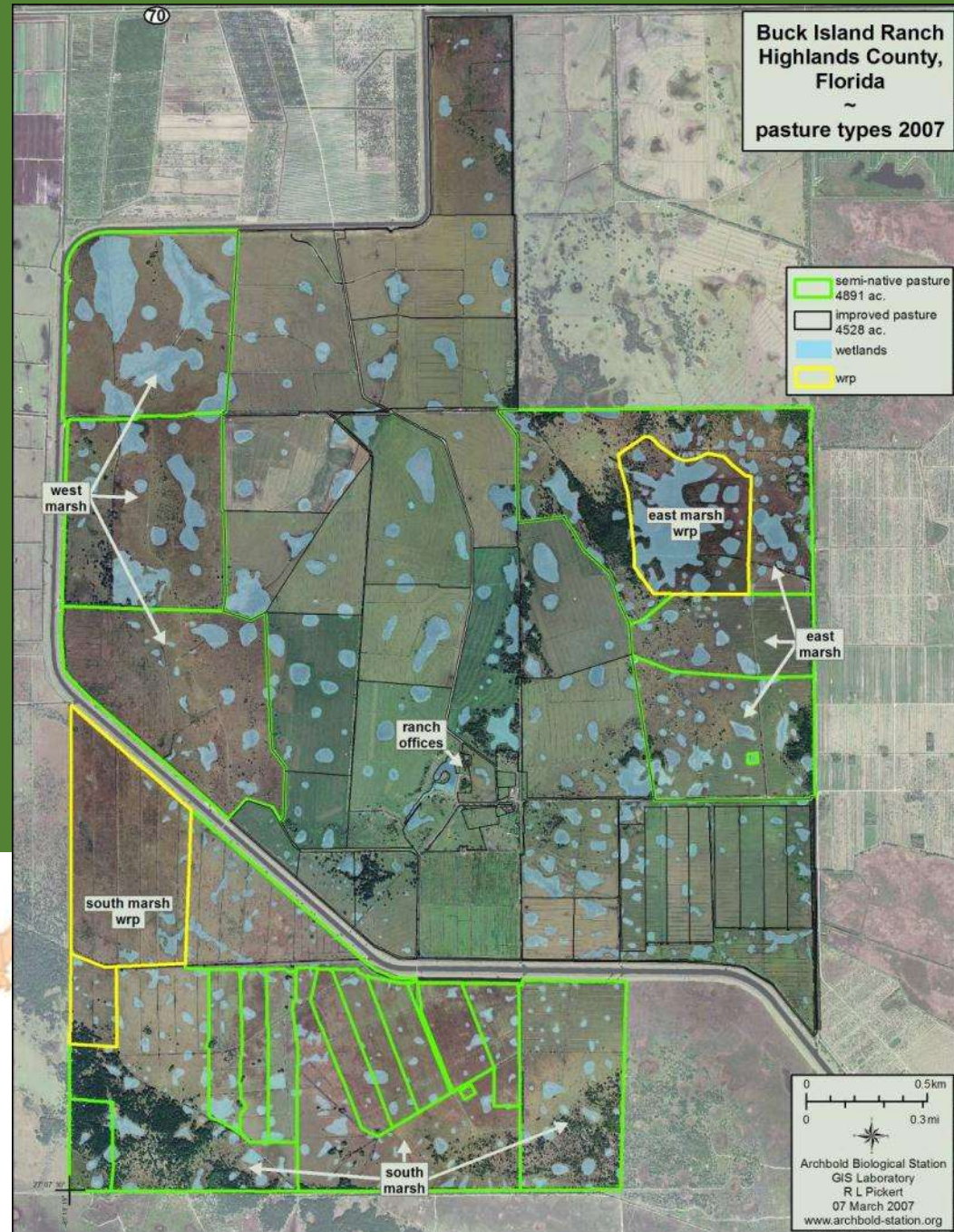
Southeastern agriculture a national opportunity for agriculture and conservation

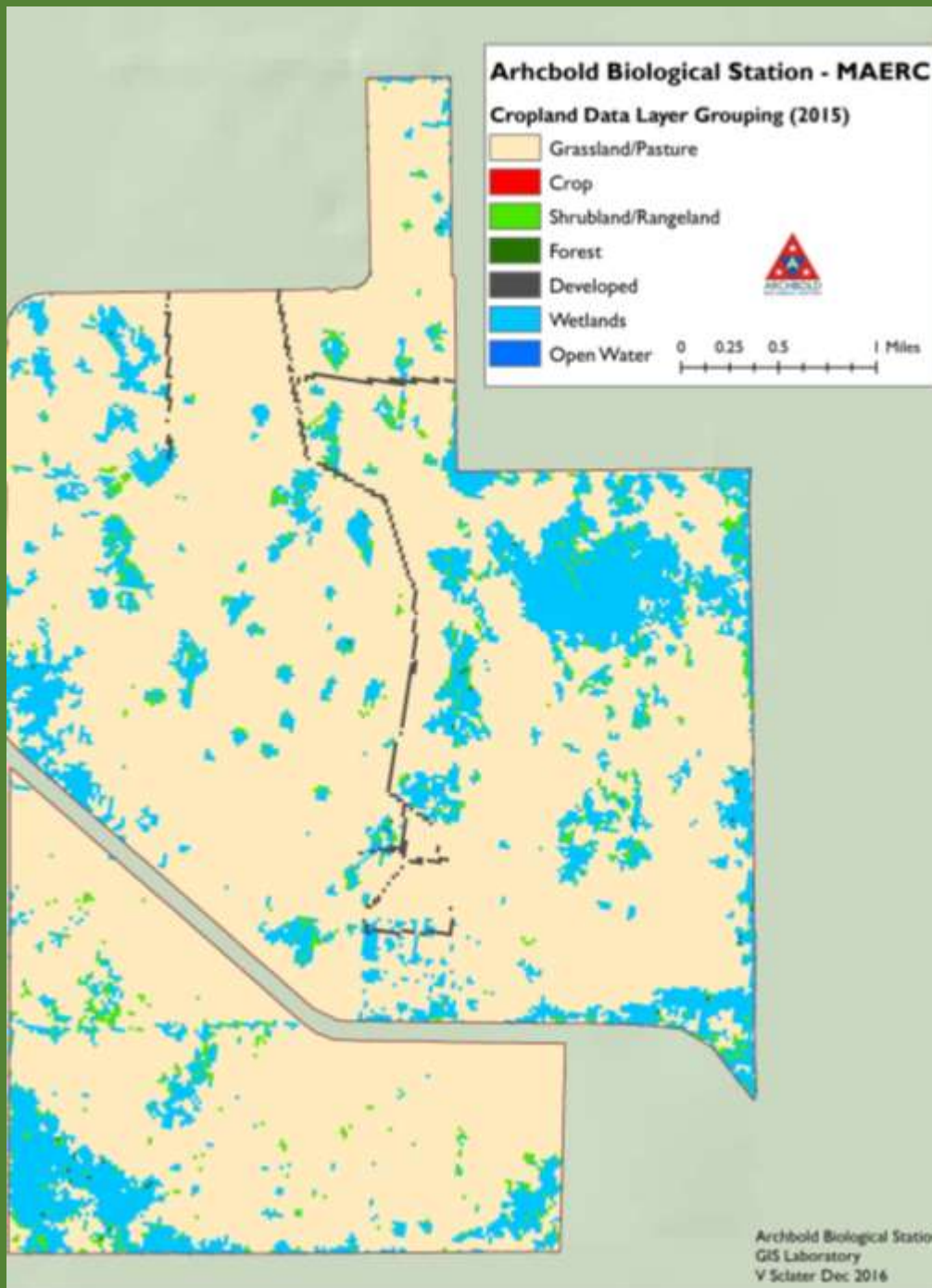


USDA LTAR

Archbold's MAERC

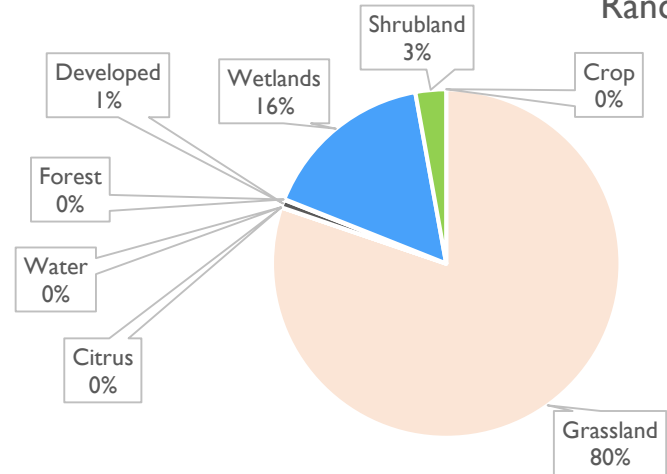
- 10,500 acres
- Cow calf 3,000 head (top 400 nation, top 20 FL)
- ~5,500 improved pasture and ~4,500 semi-native
- sod, palms, hunt lease, etc
- NEPES water PES contract w/SFWMD
- USDA WRP easements ~4,000 acres





10,500 acres

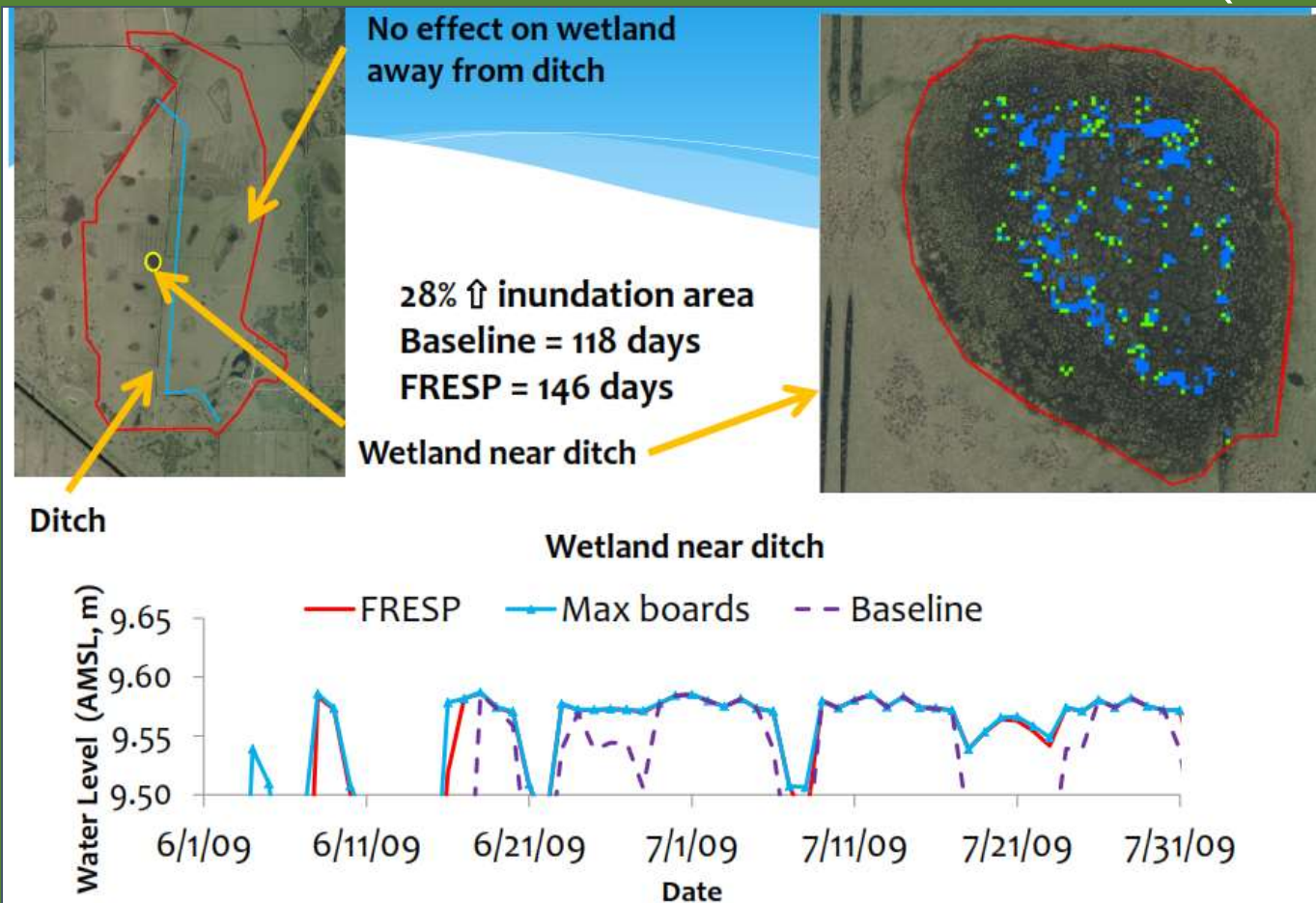
Buck Island Ranch



Sustaining ecosystem services from wetlands embedded in improved and semi-native pasture (biodiversity, provisioning, hydrology, carbon)

- Wetland restoration
- Payments for ecosystem services
- Conservation easements

PES: Regulating Services – hydrological restoration results are from Buck Island Ranch (Mike_She)



Wetland area
**inundated
increased by
28%**
Wetlands far
from ditches
not affected

When riser boards were installed resulted in
22% reduction in flow.

Water retention increases subsurface storage.

Wetland Native Plant Diversity

> in semi-native pastures
& ↓ with water depth:



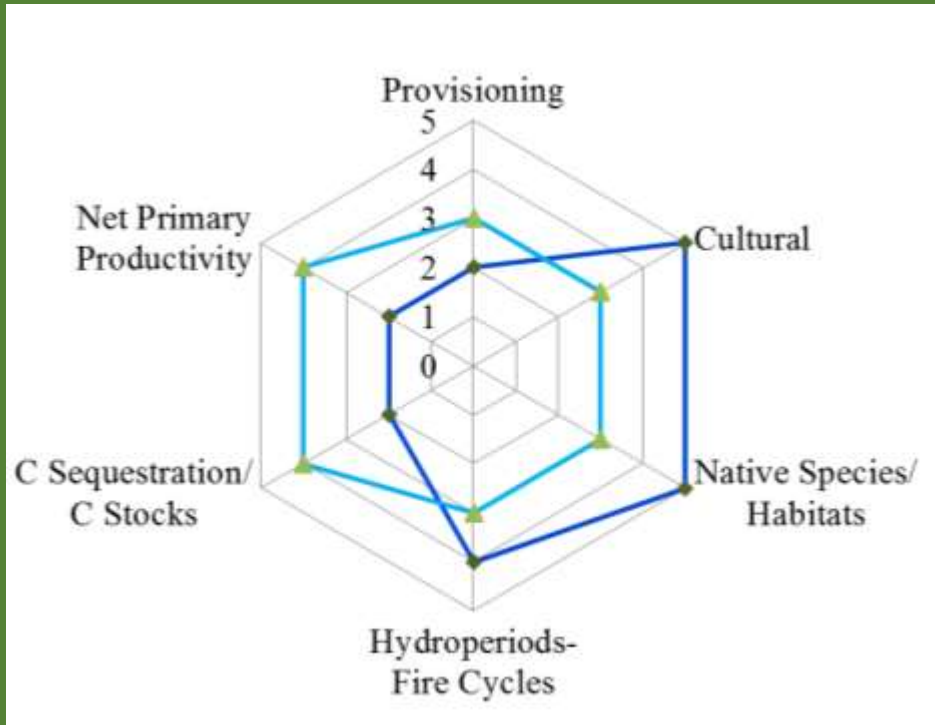
Provisioning Ecosystem Services

Upland forage cover declines with water depth



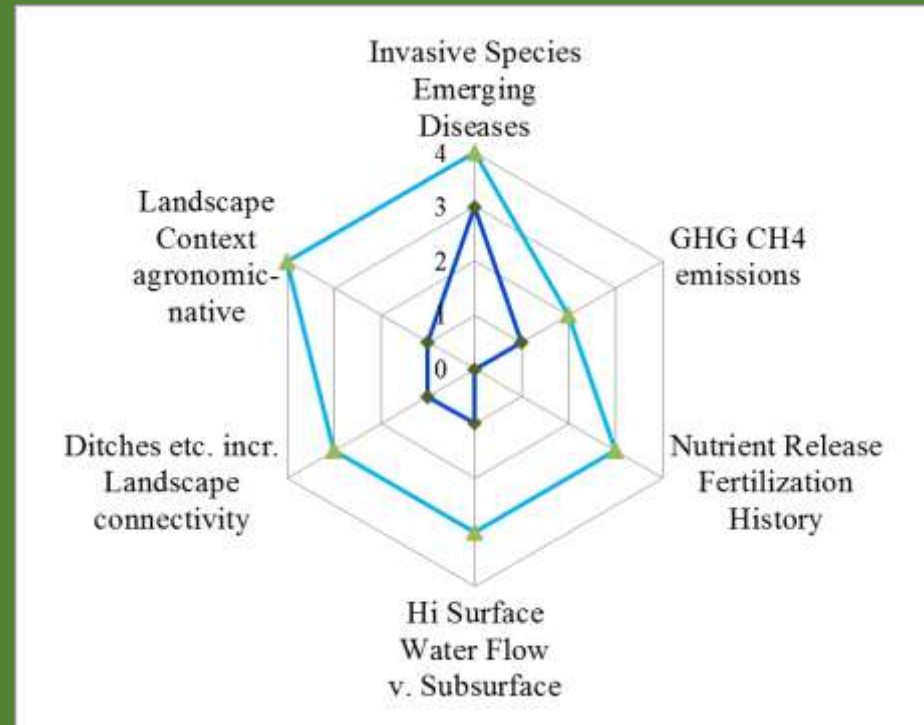
LOCAL SCALE

Ecosystem Services in Wetlands on Ranch



LOCAL SCALE

Ecosystem Dis-services in Wetlands on Ranch



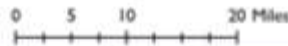
Wetlands in improved pastures
Wetlands in semi-native pastures

Headwaters of the Everglades Hydrologic Unit (HUC-6)

Cropland Data Layer Grouping (2015)



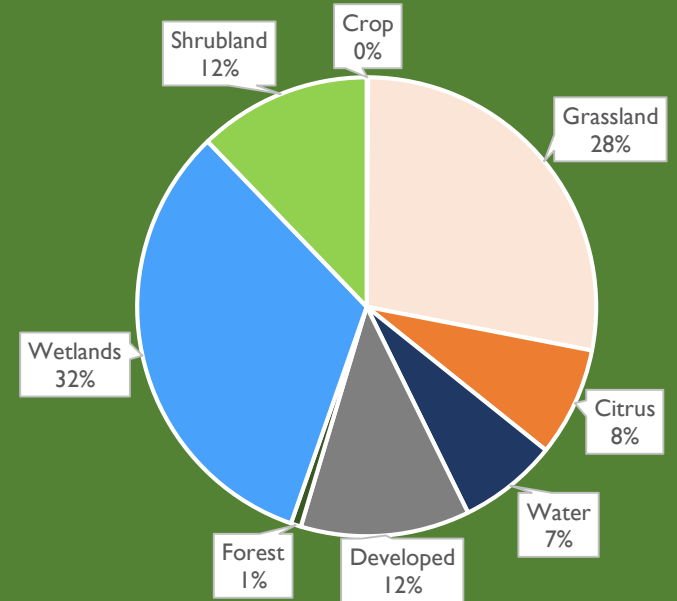
★ Archbold Biological Station and MAERC

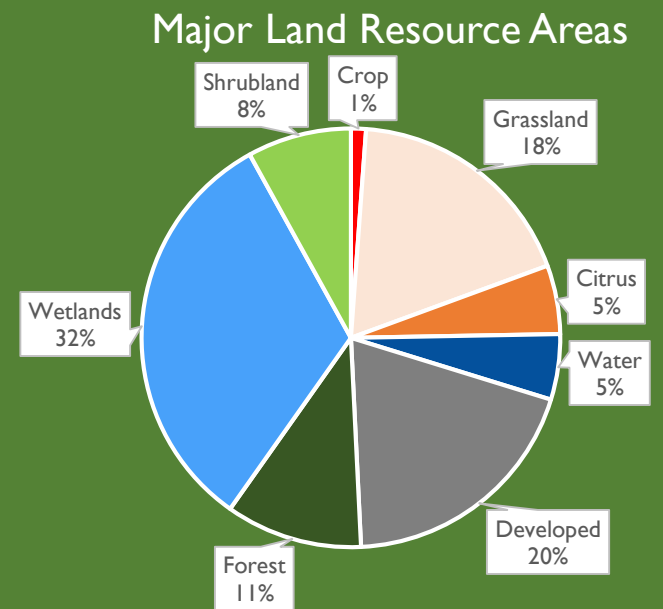
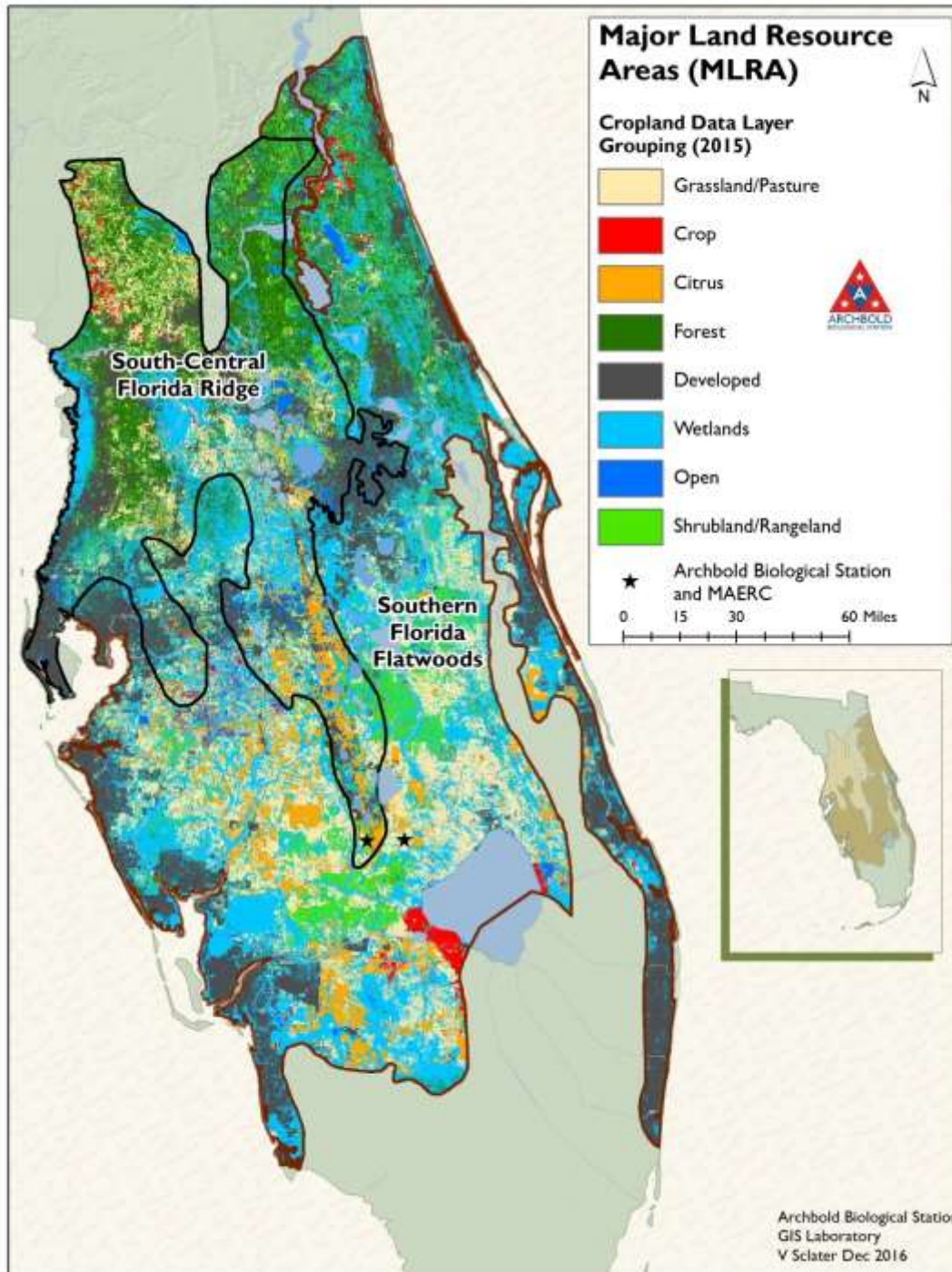


2.6 million acres

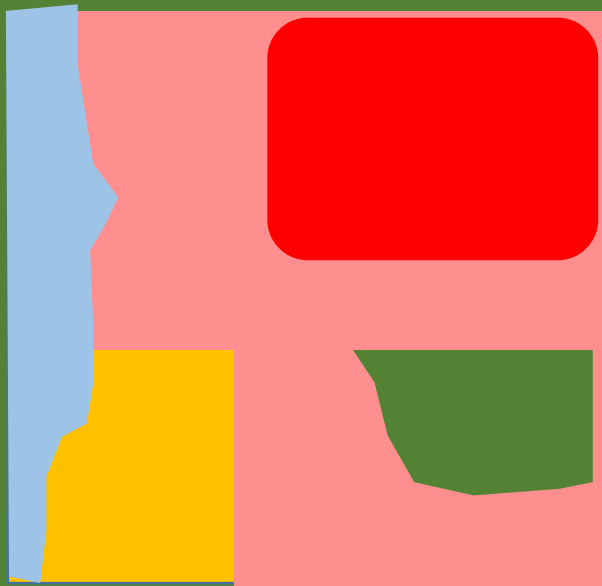
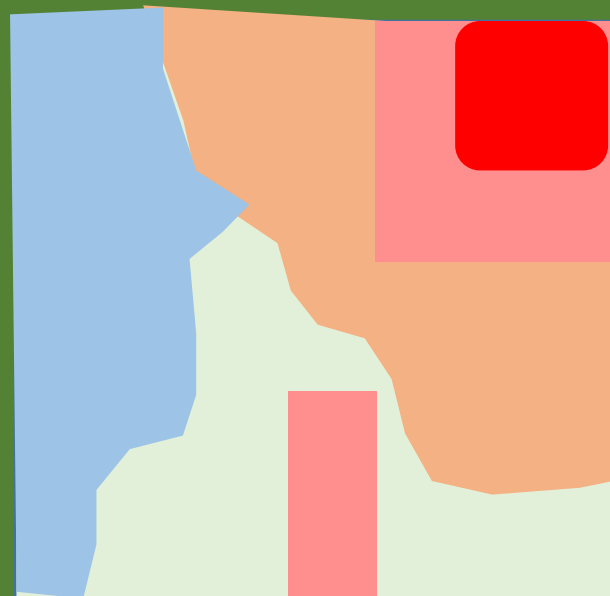
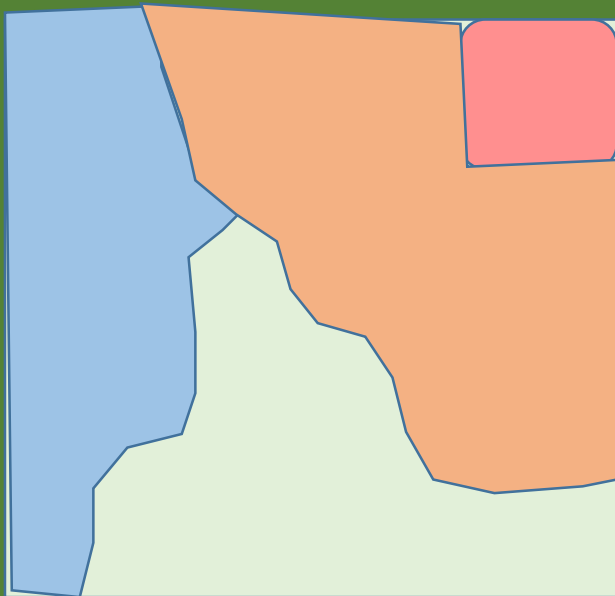
Archbold Biological Station
GIS Laboratory
V Slater Dec 2016

Headwaters of the Everglades

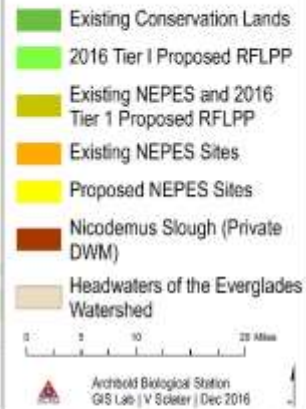




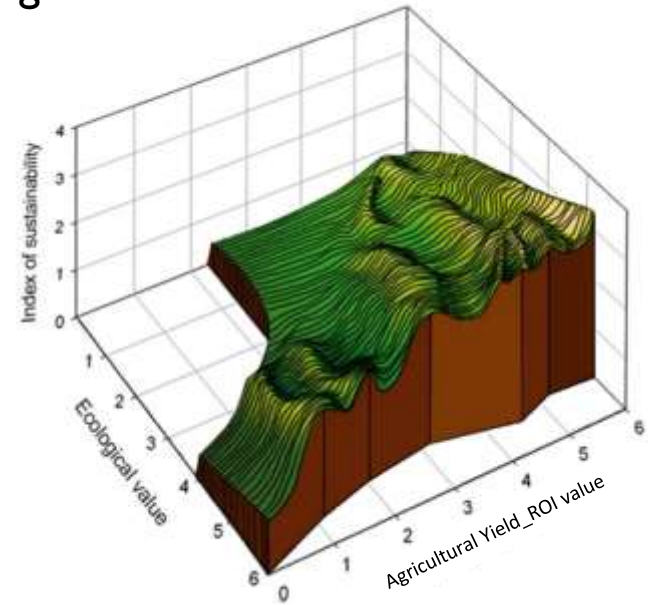
Sustaining Agriculture & Cultural Services and Environmental Values



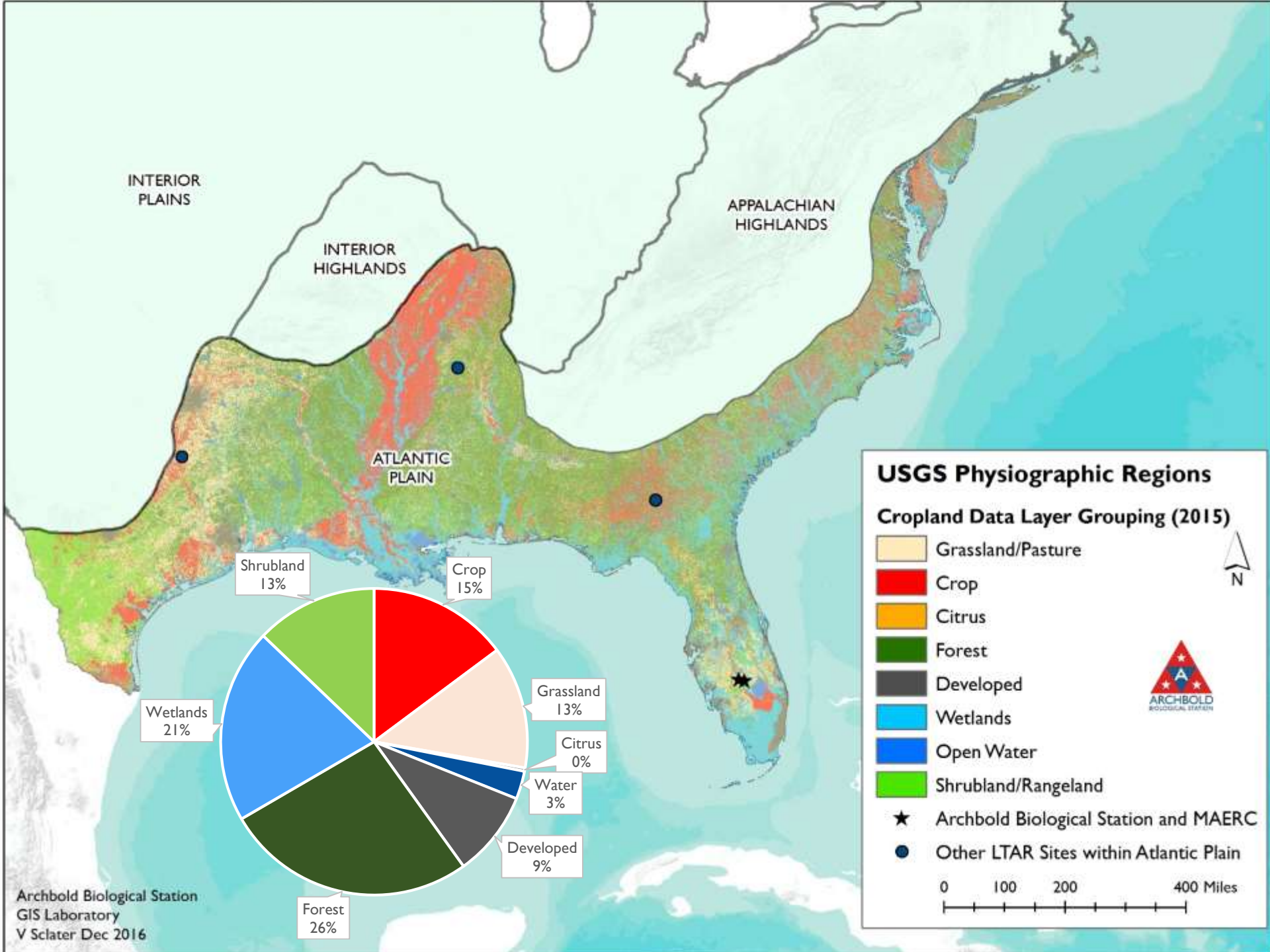
Conservation Lands in the Headwaters of the Everglades



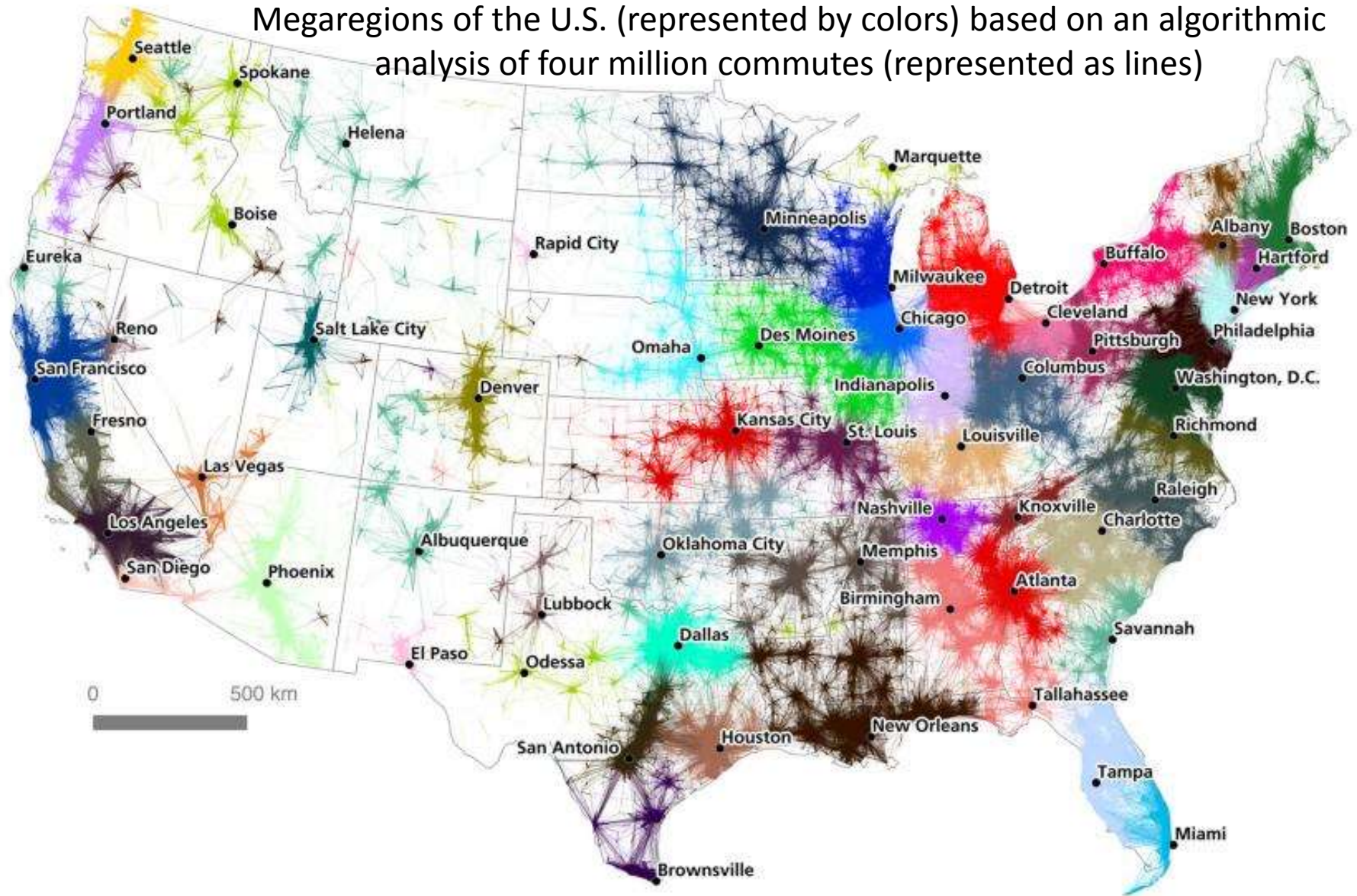
Agricultural + Environmental Values



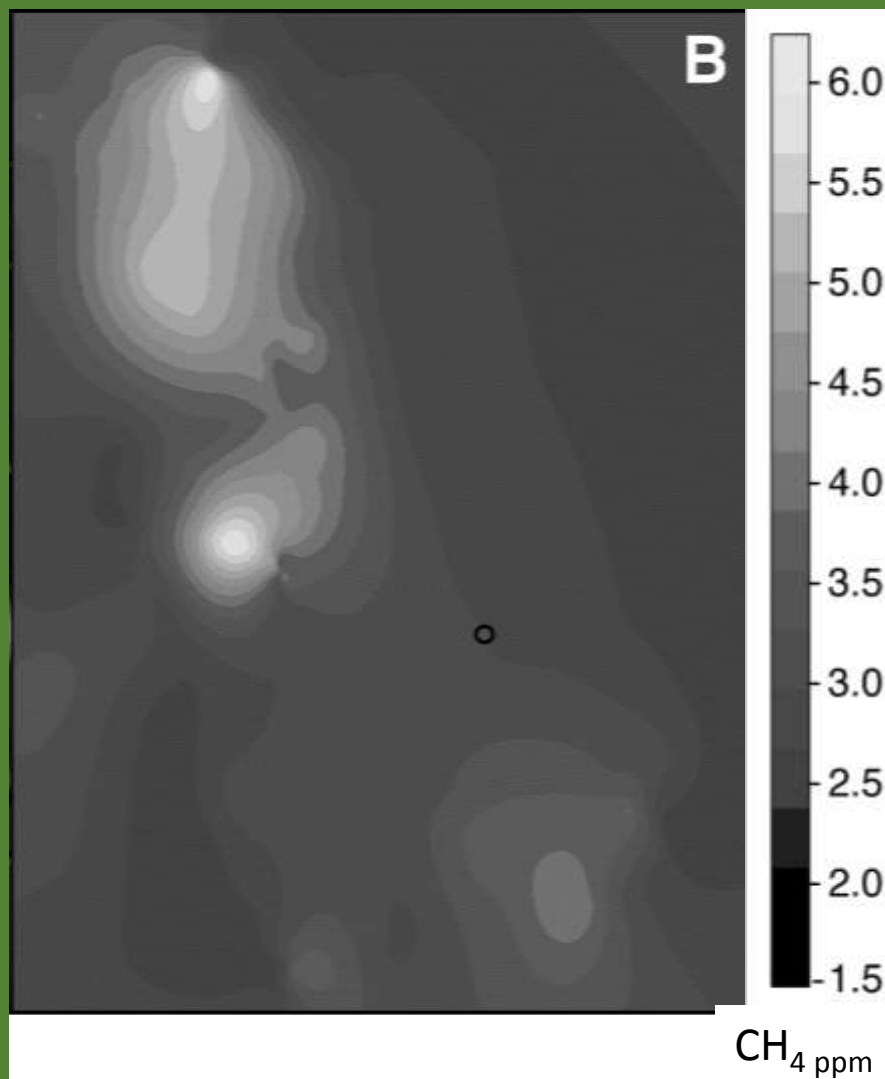
- Public lands (13% include DOD)
- Private lands – 11.5% conservation easements e.g. USDA WRP, state Forever FL and RFLPP (proposed)
- NEPES water PES contract w/SFWMD



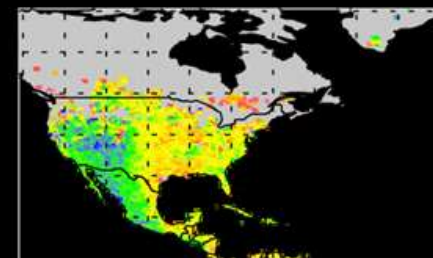
Megaregions of the U.S. (represented by colors) based on an algorithmic analysis of four million commutes (represented as lines)



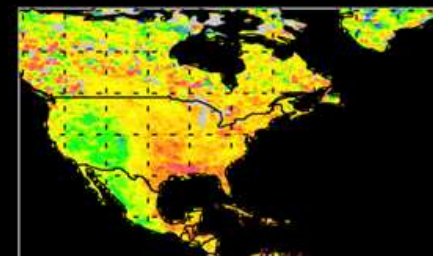
<http://news.nationalgeographic.com/2016/11/us-commutes-reveal-new-economic-megaregions-map/#/01megaregions.ngsversion.1480539744591.jpg> PLOS



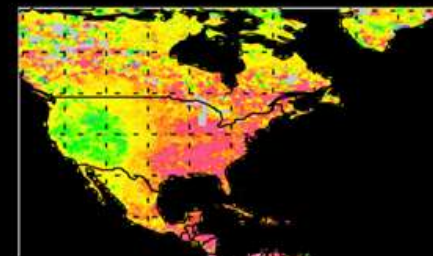
Jan-Mar



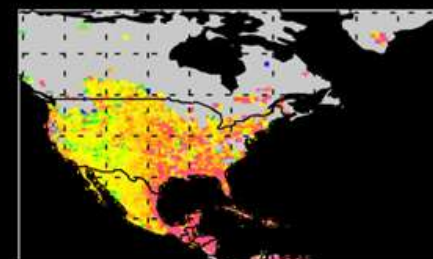
Apr-Jun



Jul-Sep



Oct-Dec



Methane column-averaged mole fraction [ppb]



Coupling ecosystem services from wetland to
ranch, to MLRA region, to eco- and mega-
regions, to global

