Florida Department of Environmental Protection

Large Rivers
Stream Condition Index Expectations

May 17, 2017

Aquatic Ecology and Quality Assurance Section

Water Quality Standards Program





Outline

- Background
  - Kiefer study and AMEC report (provided by Joy)
- Plan of Study
- Initial data
- Initial Summary
- Next steps
- Questions/comments

SCI in Large Rivers

- Biological communities in large rivers need assessed, but is SCI an appropriate tool?
  - Concerns: Lacking adequate habitat or flow for organisms
  - Charge: Determine parameters when SCI should be use and when it should not, and then determine a better tool for when the SCI will not be used.

Objectives

1. Determine how large rivers should be defined.
2. *Determine when the SCI is an appropriate tool to use for biological assessment.*
3. *When the SCI is not deemed appropriate, what other biological assessment indicators should be used?*

Methods

1. Determine how large rivers should be defined.
2. Obtain additional large river sites to supplement Kiefer Stream Classification dataset and classify additional large river sites according to Kiefer classification from publicly available GIS data.
3. **Use Stream Classification dataset to conduct analyses to determine why some large river sites score well and some fail.**

Methods cont.

3. Use Stream Classification dataset to conduct analyses to determine why some large river sites score well and some fail.
   a. Examine entire Large Rivers Stream Classification dataset and determine if there is any parameter that plays a role in SCI failure.
   b. Examine individual large rivers within LRSC dataset with multiple sampling sites and determine if there is a relationship among sites along the river or individual sites and SCI failing scores.
   c. Examine individual sites and determine how SCI scores change with hydrologic parameters.
      i. Compare SCI to drainage area (watershed size) to see if there is an area at which SCI scores decrease.
      ii. Compare SCI to additional river size parameters to see if there is a value(s) at which SCI scores decrease.
      iii. Compare SCI to additional parameters if needed.

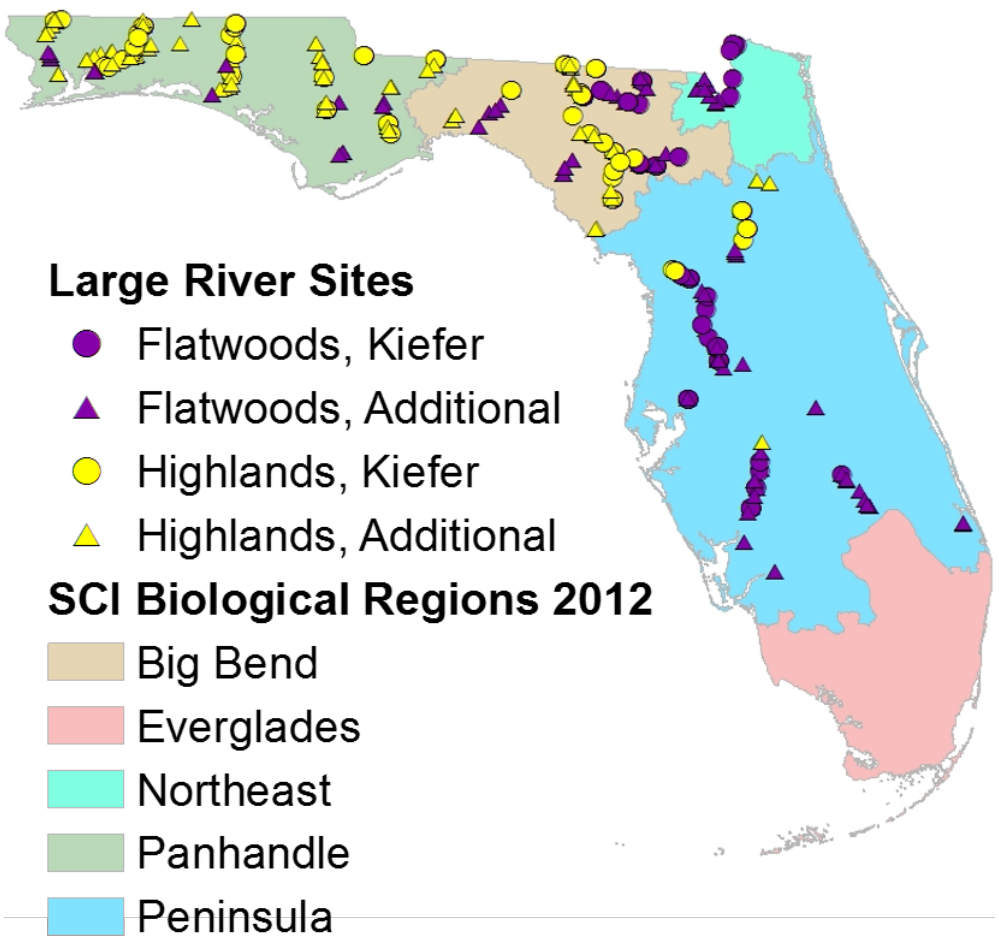
Methods cont.

4. Develop a Decision Key for determining if site is appropriate for SCI bioassessment tool.
5. *Compile list of methods used to assess large rivers in other states to determine possible additional bioassessment tools.*
6. *Conduct a study to assess if changes to the SCI SOP would yield acceptable methods for bioassessment of large rivers.*

Define Large Rivers

- Drainage area ≥ 500 square miles (AMEC/Kiefer classification)
  - Streams draining larger than 500 square mile basins should be treated as unique case studies
  - Larger watersheds tend to integrate a greater variety of watershed conditions and their surface versus groundwater sources, water chemistry, and geological controls tend to differ as a result
  - Hydrologic modifications
  - No systems of reasonably intact or near-natural watersheds for baseline reference

Large River Sites



Panhandle

- Escambia River
- Blackwater River
- Yellow River
- Shoal River
- Chochtawatchee River
- Chipola River
- Apalachicola River
- Ochlockonee River

Big Bend

- St Marks River
- Aucilla River
- Steinhatchee River
- Withlacoochee River
- Alapahoochee River
- Alapaha River
- Suwannee River
- Santa Fe River

Northeast

- St Marys River

Peninsula

- Etonia Creek
- Oklawaha River
- Withlacoochee River
- Hillsborough River
- Peace River
- Kissimmee River
- Caloosahatchee River
- St Lucie River

Large River Sites

- 509 data points
  - Flatwoods, n=249
  - Highlands, n=260
- Sites
  - Flatwoods n=103
  - Highlands n= 116

Large River SCI Scores

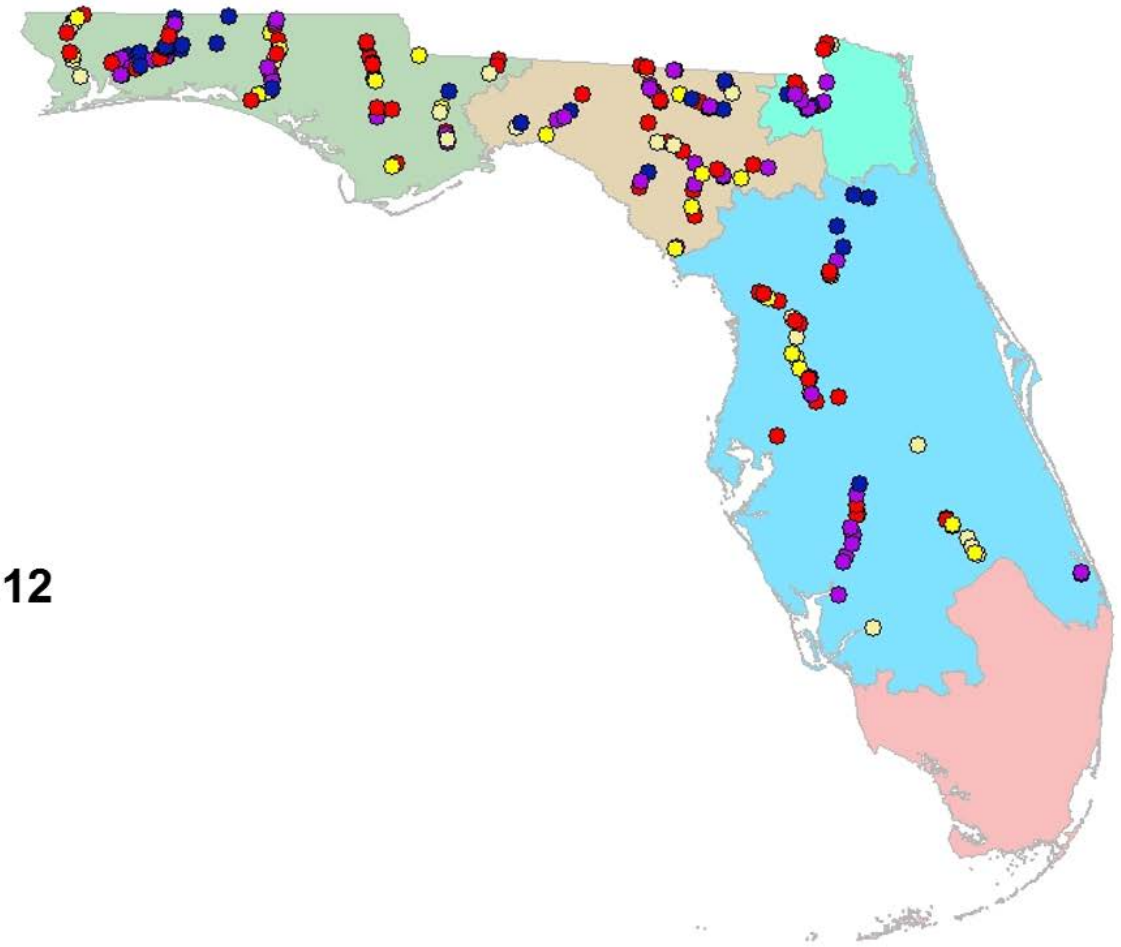
Large River Sites

SCI2012

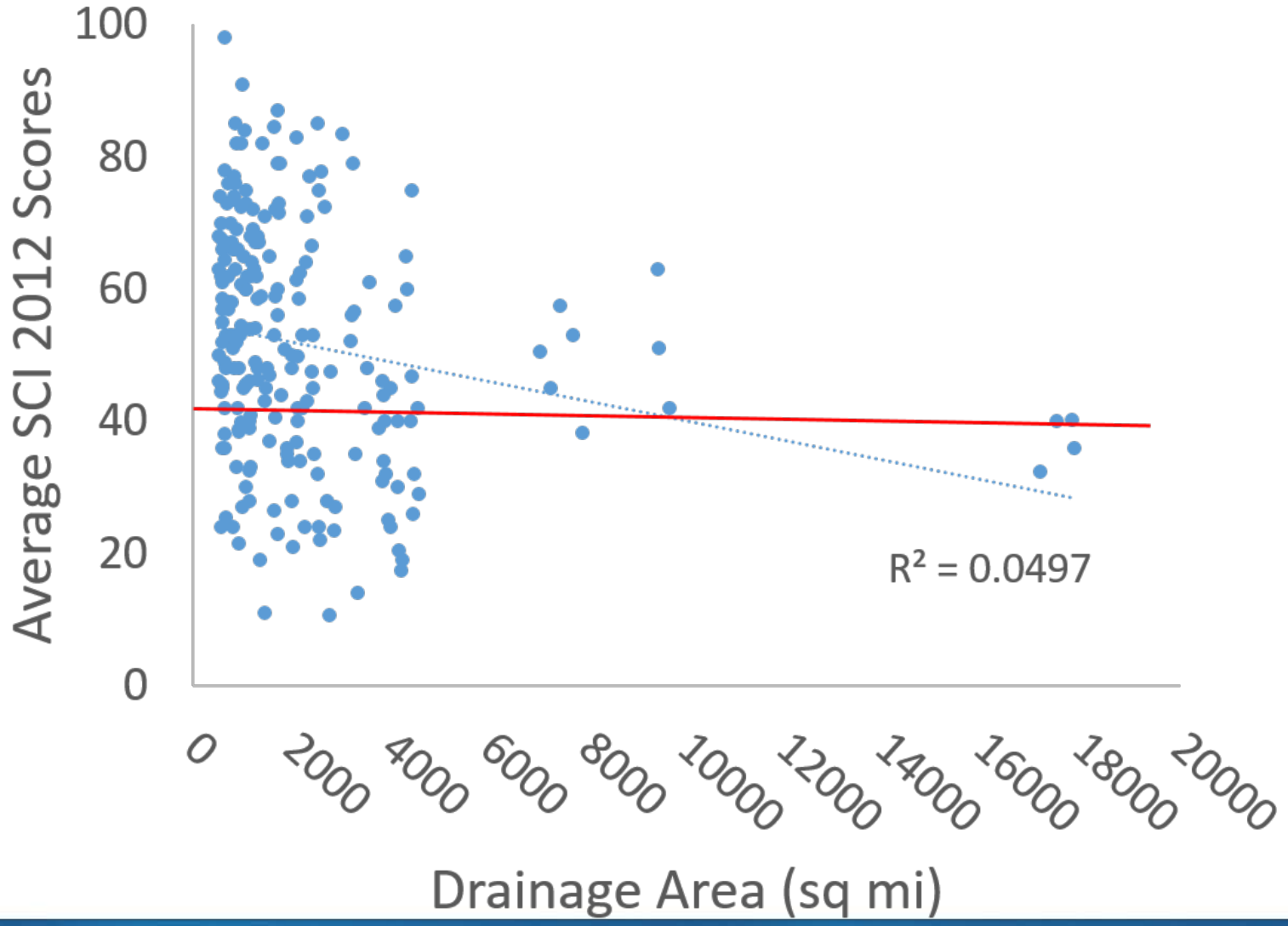
- 4 - 29
- 30 - 39
- 40 - 57
- 58 - 72
- 73 - 98

SCI Biological Regions 2012

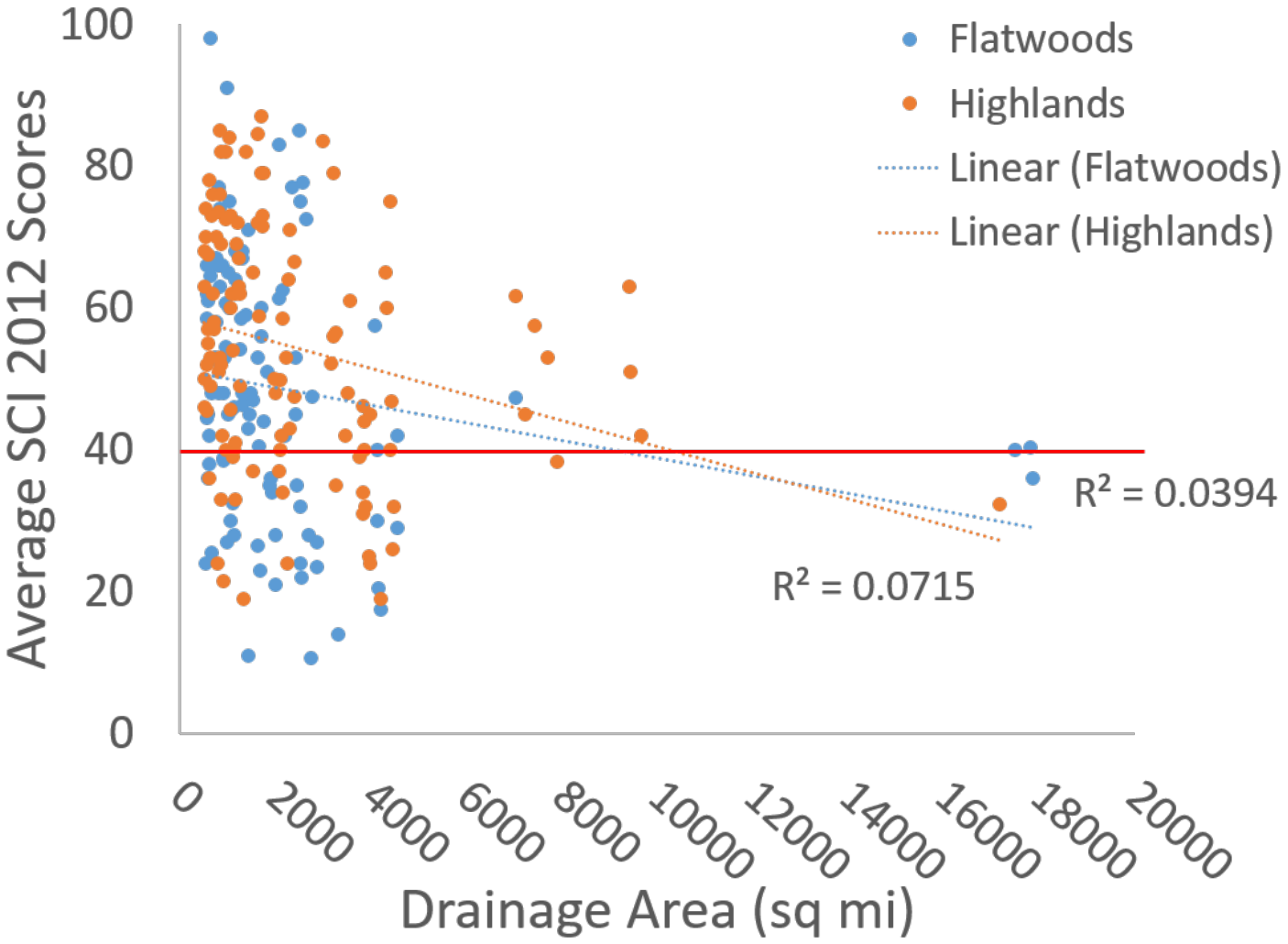
- Big Bend
- Everglades
- Northeast
- Panhandle
- Peninsula



Drainage Area

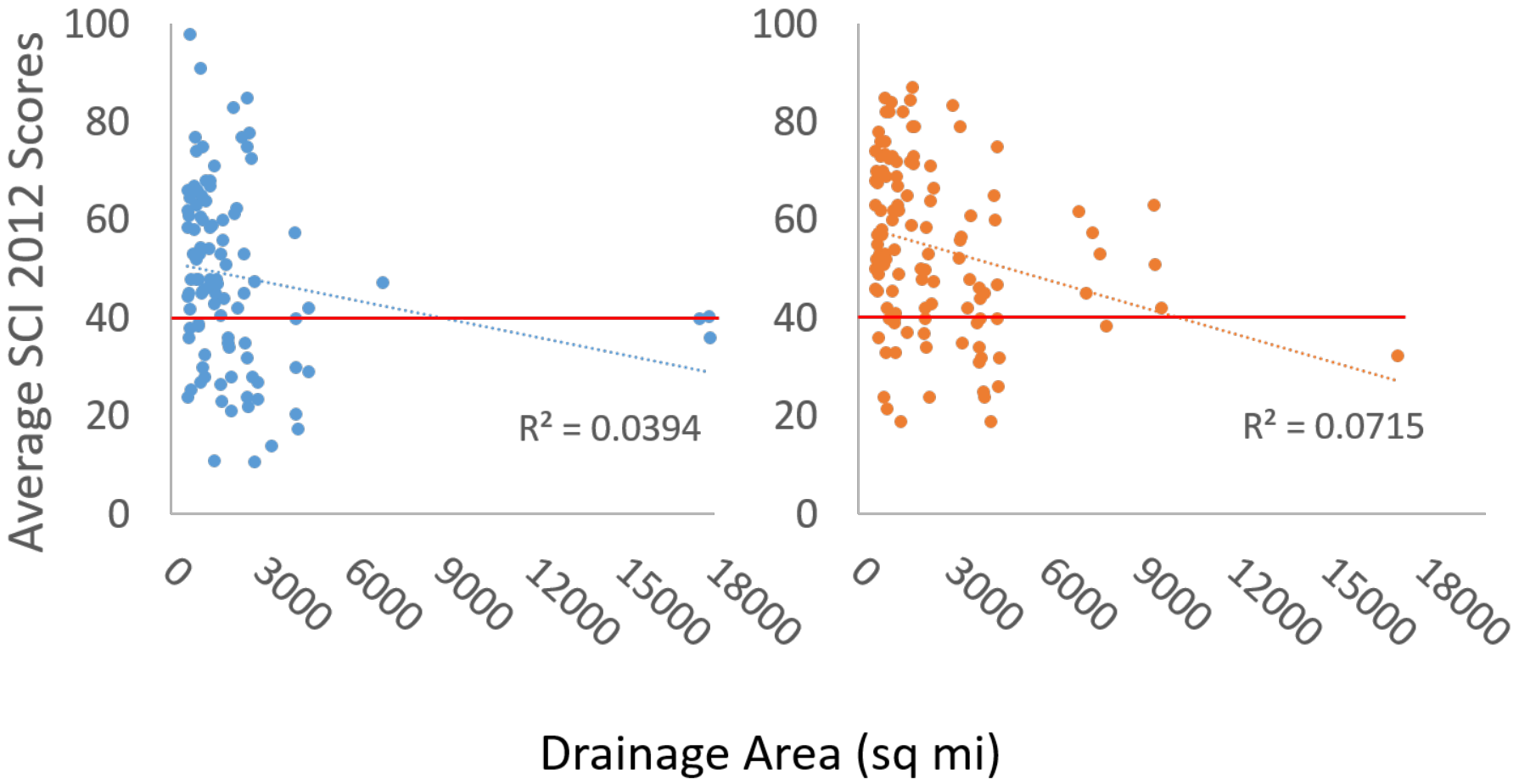


Drainage Area



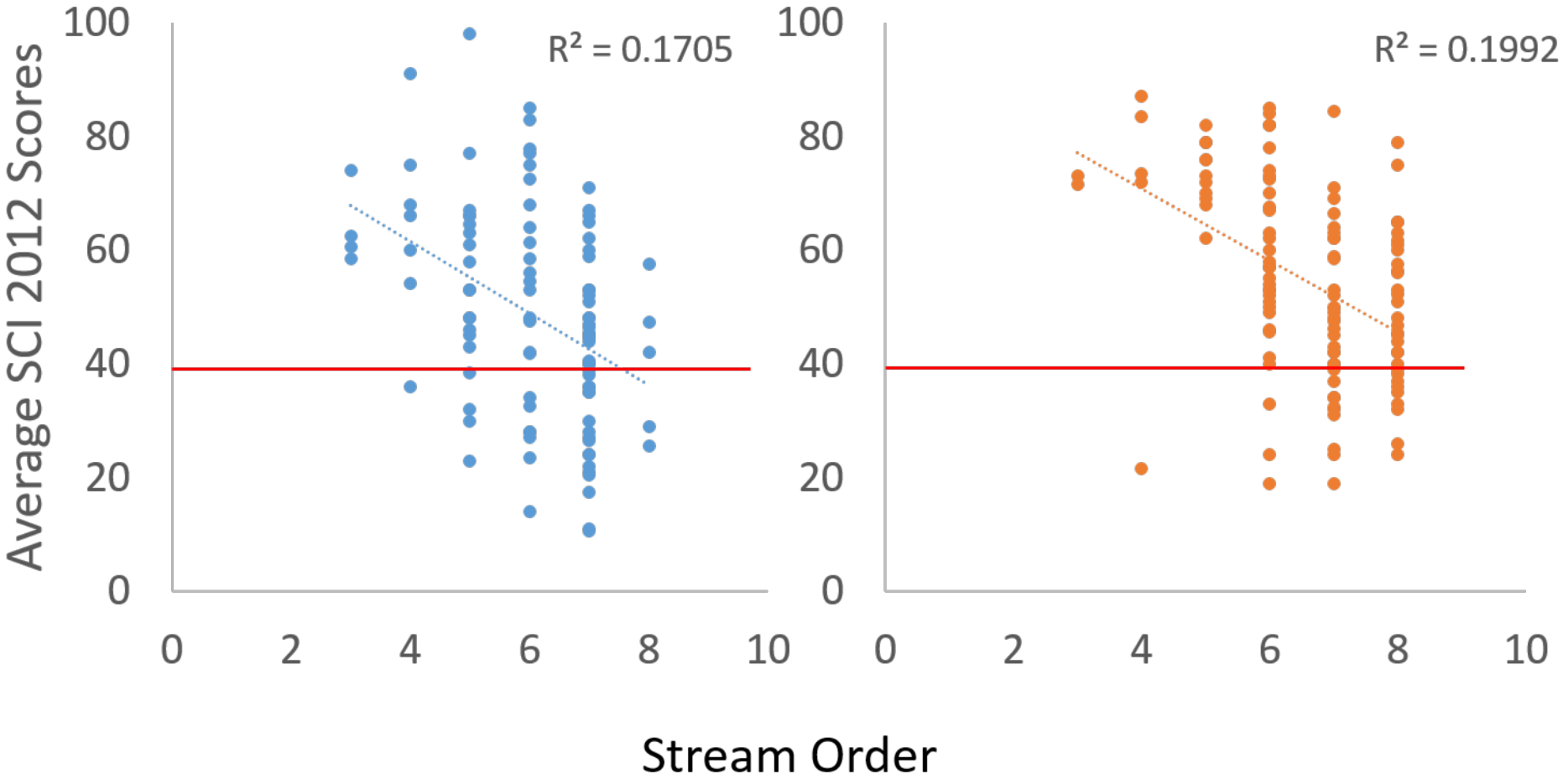
Drainage Area

Flatwoods & Highlands



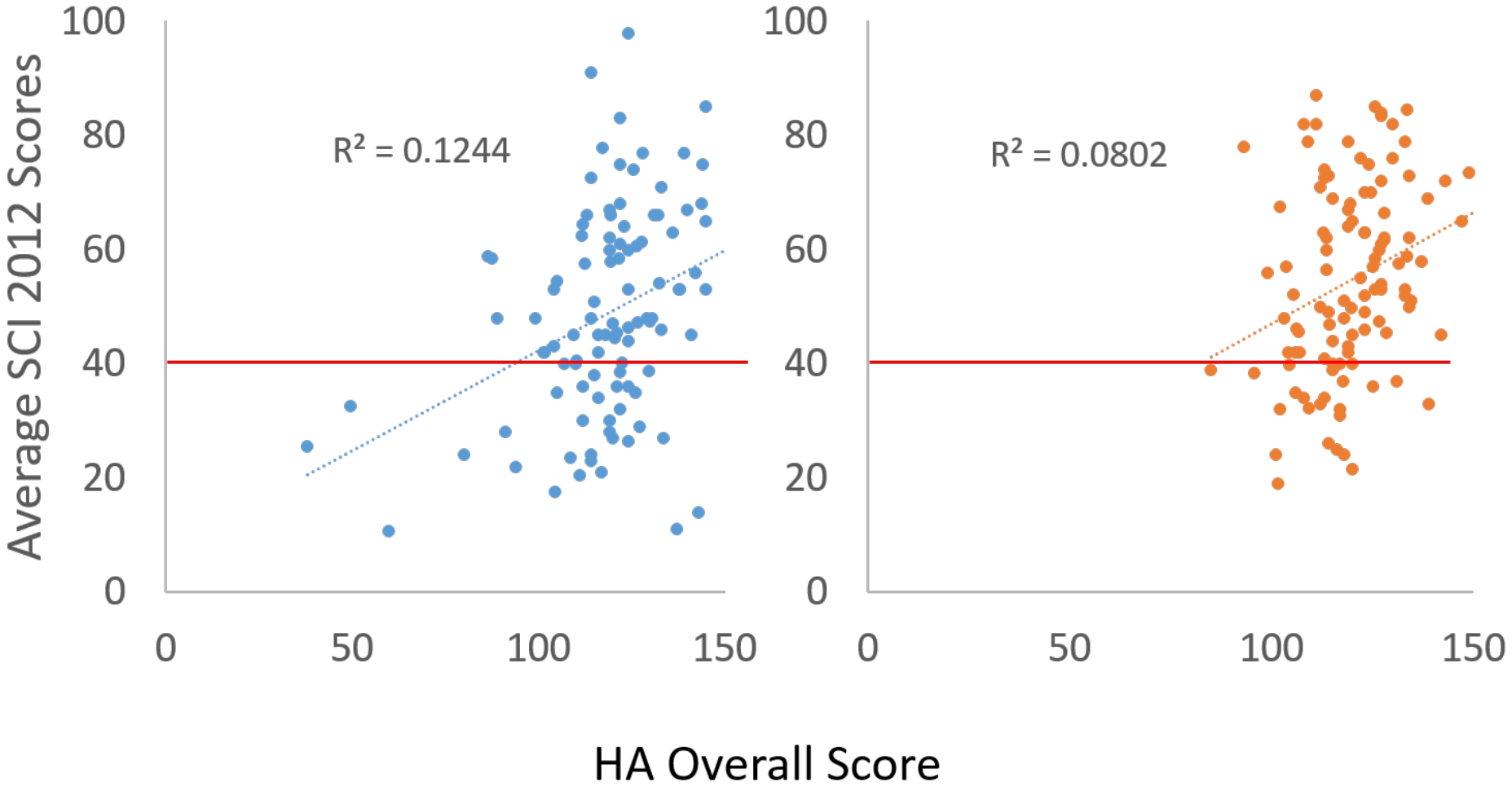
Stream Order

Flatwoods & Highlands



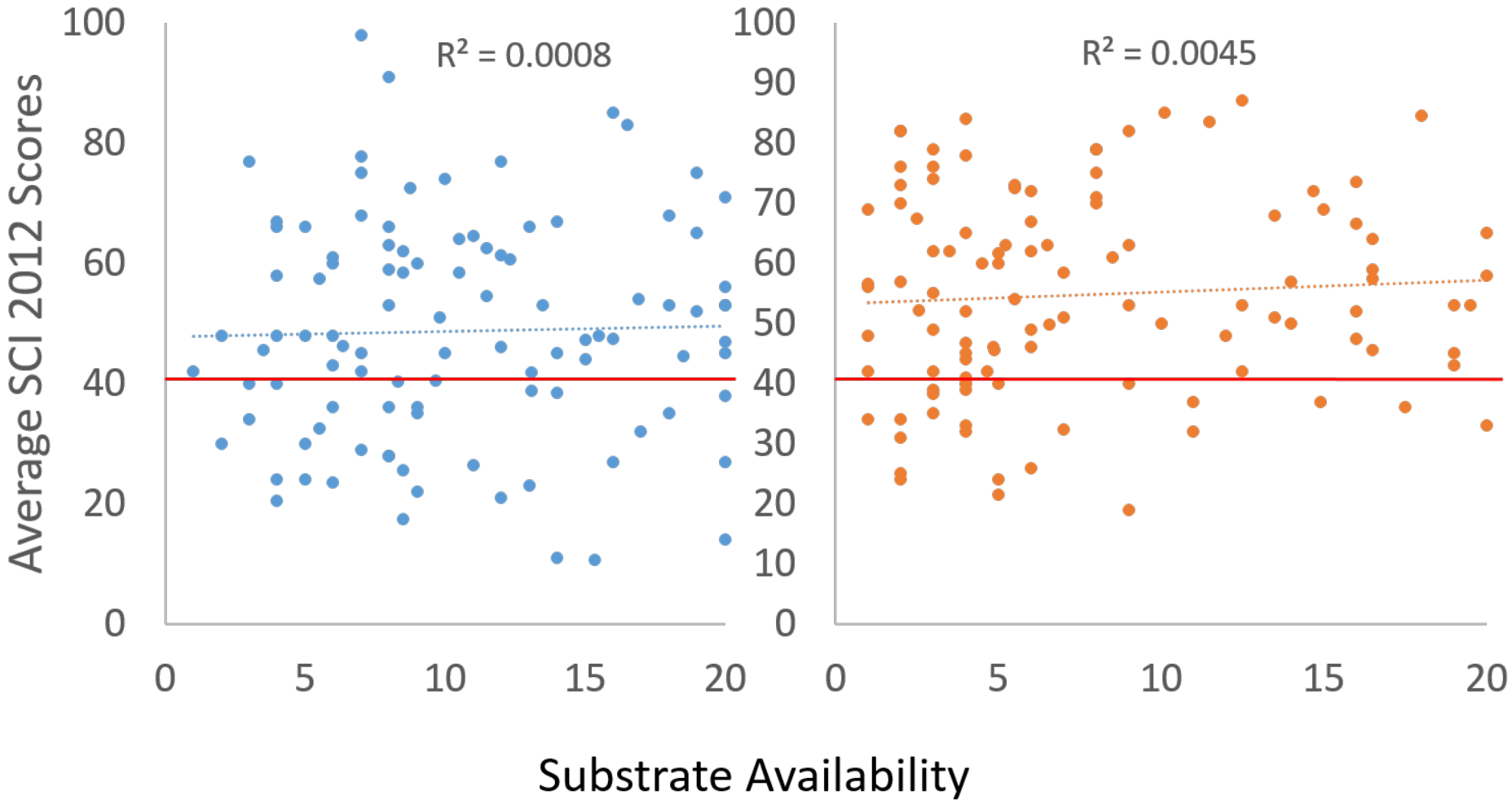
Habitat Assessment

Flatwoods & Highlands



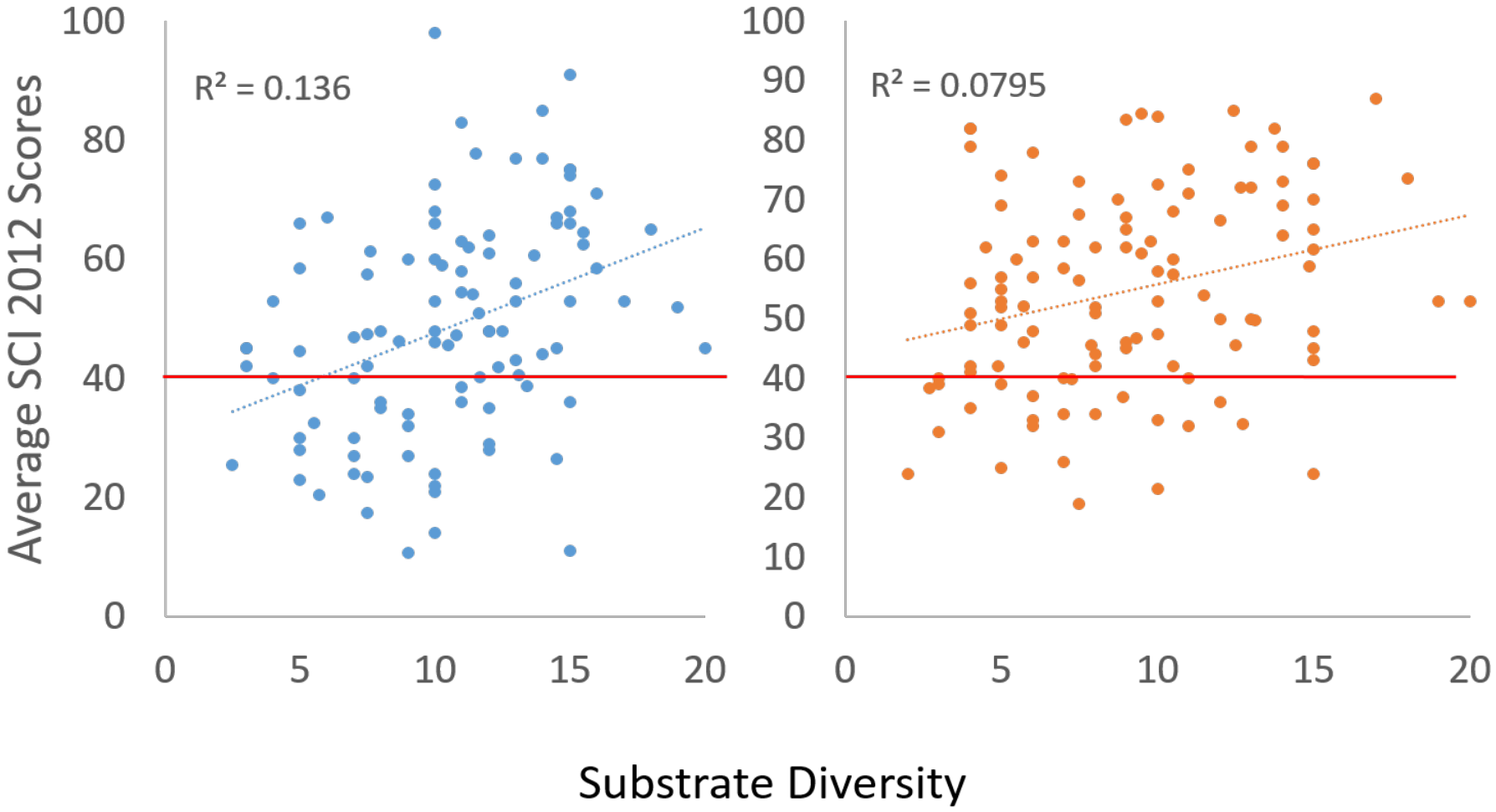
Substrate Availability

Flatwoods & Highlands



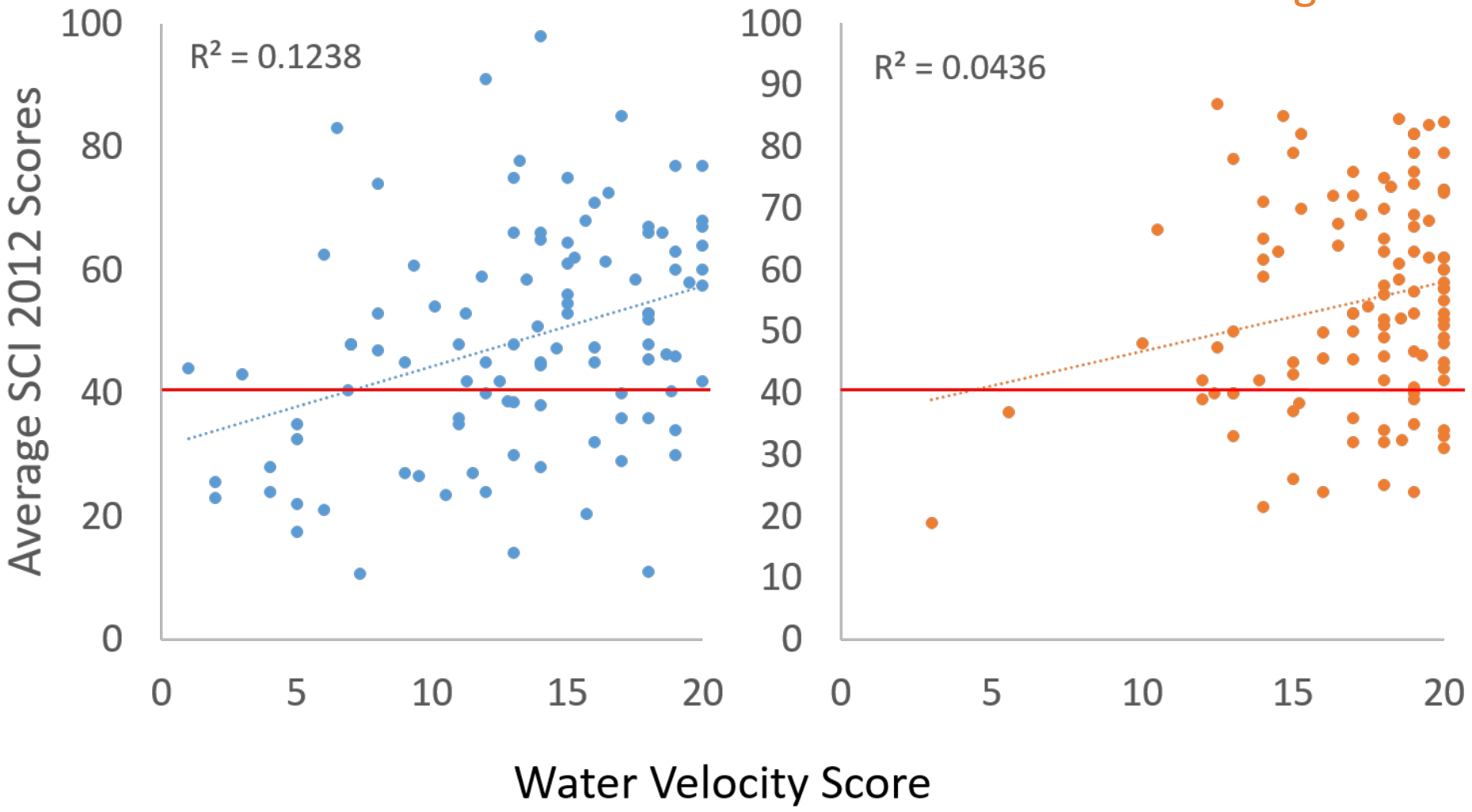
Substrate Diversity

Flatwoods & Highlands

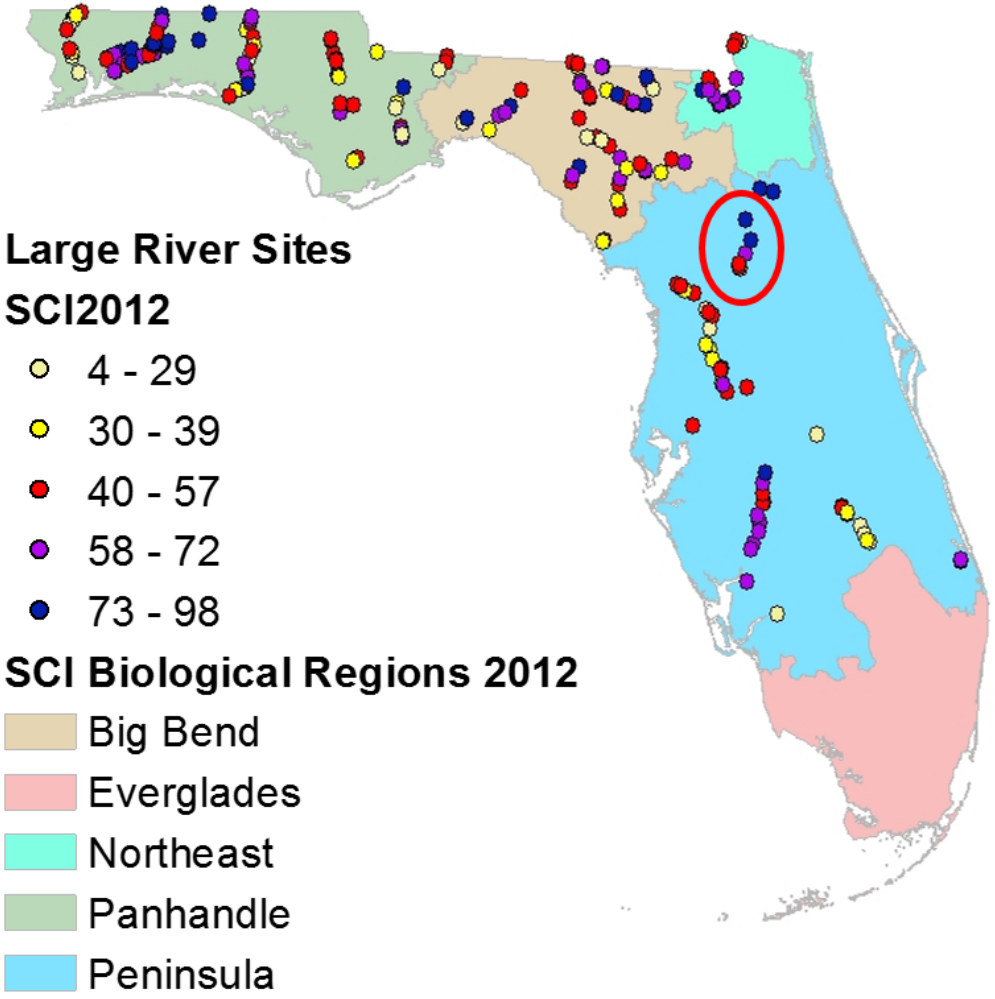


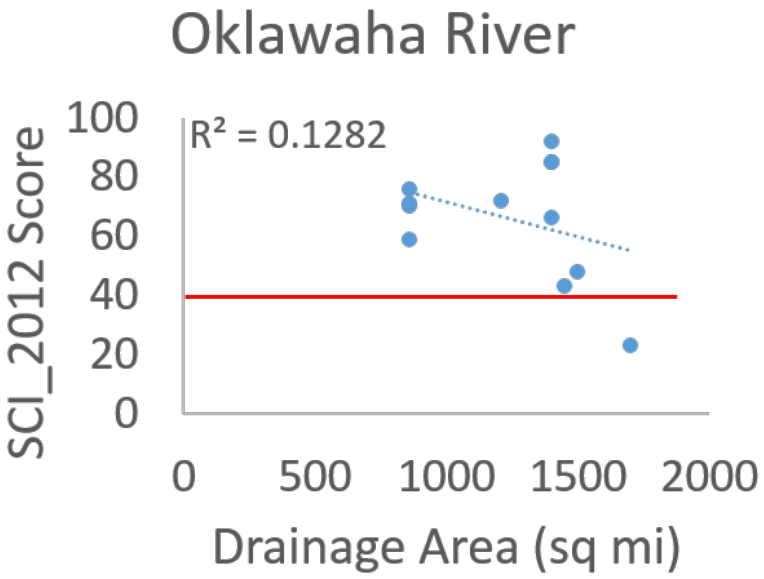
Water Velocity

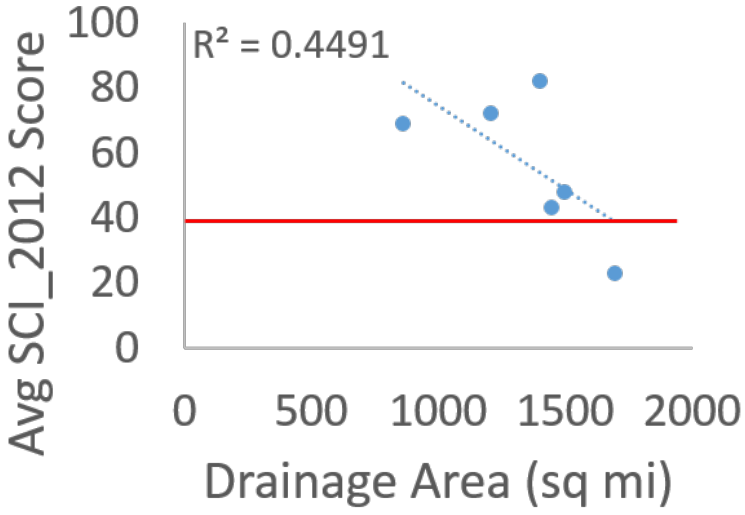
Flatwoods & Highlands



Individual River System







Summary

- Individual samples consistently fail SCI at drainage areas > 5000 sq miles (limited data for DA > 5000 sq mi)
- No significant difference between highlands sites and flatwoods sites
- Habitat Assessment components behave similarly between highlands and flatwoods sites

Additional Information

- Previous sites determined not appropriate for SCI (Trend Network)
  - How would these sites compare?
- Individual river systems
  - Suggestions?

Next Steps

- Continue analyses of LRSC dataset
- Individual river, site selection and analyses

Next Steps

3. Use Stream Classification dataset to conduct analyses to determine why some large river sites score well and some fail.
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      iii. Compare SCI to additional parameters if needed.

Next Steps

- Develop Decision Key/Initial Report
- Additional (Methods 5 and 6) if needed.
  - Compile list of methods used to assess large rivers in other states to determine possible additional bioassessment tools.
  - Conduct a study to assess if changes to the SCI SOP would yield acceptable methods for bioassessment of large rivers.

Thank you!

Questions? Comments?