



Florida Department of Environmental Protection

Reference Stream Sampling Status Report

Aquatic Ecology and Quality Assurance

March 30, 2016





Objectives of Sampling

- Re-evaluate historic reference streams, vet old list and establish a revised list of reference streams
- Document changes in the conditions of historic reference streams



List of Analytes

- Stream Condition Index
- Rapid Periphyton Survey
 - o Algal ID sample, if periphyton is abundant.
- Linear Vegetation Survey
- Habitat Assessment
- Hydrologic Modification Characterization (per SOP FT3101)
- Chlorophyll-a
- Turbidity
- Alkalinity
- Color
- Ammonia
- Nitrate+nitrite
- Total Phosphorus
- Total Kjeldahl Nitrogen
- qPCR – HF183
- Calcium
- Sulfate
- Chloride
- Sodium
- Potassium
- Carbonate
- Magnesium
- Bromide
- Sucralose
- Acetaminophen
- Total Organic Carbon
- Total Dissolved Solids
- Total Suspended Solids
- Fecal coliforms & e. coli



SCI Summary

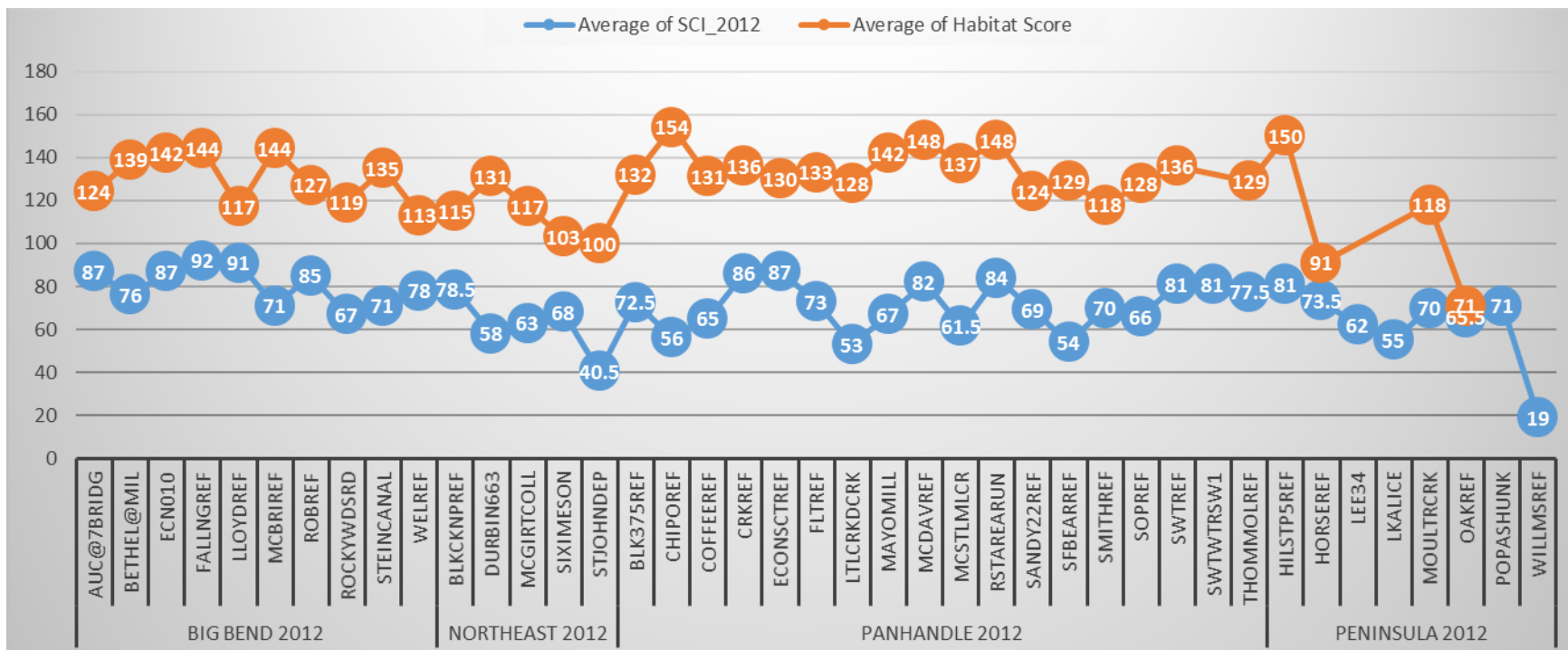
June 2014 – March 2016

- 57 samples collected
 - Big Bend – 13
 - Northeast – 8
 - Panhandle – 25
 - Peninsula – 11
- Average overall SCI score = 71
 - Big Bend – 81
 - Northeast – 61
 - Panhandle – 72
 - Peninsula – 64
- Min SCI (Williams Creek) = 19
- Max SCI (Lloyd Creek) = 92
- Overall St Deviation = 14

Station Nickname	Big Bend 2012	Northeast 2012	Panhandle 2012	Peninsula 2012
AUC@7BRIDG	87	-	-	-
BETHEL@MIL	76	-	-	-
BLK375REF	-	-	72.5	-
BLKCKNPREF	-	78.5	-	-
CHIPOREF	-	-	56	-
COFFEEREF	-	-	65	-
CRKREF	-	-	86	-
DURBIN663	-	58	-	-
ECN010	87	-	-	-
ECONSTREF	-	-	87	-
FALLNGREF	92	-	-	-
FLTREF	-	-	73	-
HILSTP5REF	-	-	-	81
HORSEREF	-	-	-	73.5
LEE34	-	-	-	62
LKALICE	-	-	-	55
LLOYDREF	91	-	-	-
LTLCKDKCRK	-	-	53	-
MAYOMILL	-	-	67	-
MCBRIREF	71	-	-	-
MCDAREF	-	-	82	-
MCGIRTCOLL	-	63	-	-
MCSTLMCLR	-	-	61.5	-
MOULTRCRK	-	-	-	70
OAKREF	-	-	-	65.5
POPASHUNK	-	-	-	71
ROBREF	85	-	-	-
ROCKYWDSDR	67	-	-	-
RSTAREARUN	-	-	84	-
SANDY22REF	-	-	69	-
SFBEARREF	-	-	54	-
SIXIMESON	-	68	-	-
SMITHREF	-	-	70	-
SOPREF	-	-	66	-
STEINCANAL	71	-	-	-
STJOHNDEP	-	40.5	-	-
SWTREF	-	-	81	-
SWTWTRSW1	-	-	81	-
THOMMOLREF	-	-	77.5	-
WELREF	78	-	-	-
WILLMSREF	-	-	-	19
COUNT	13	8	25	11
MINIMUM	67	41	53	19
MAXIMUM	92	79	87	81
Average of SCI_2012	81	62	71	62
ST DEVIATION	9	14	11	19



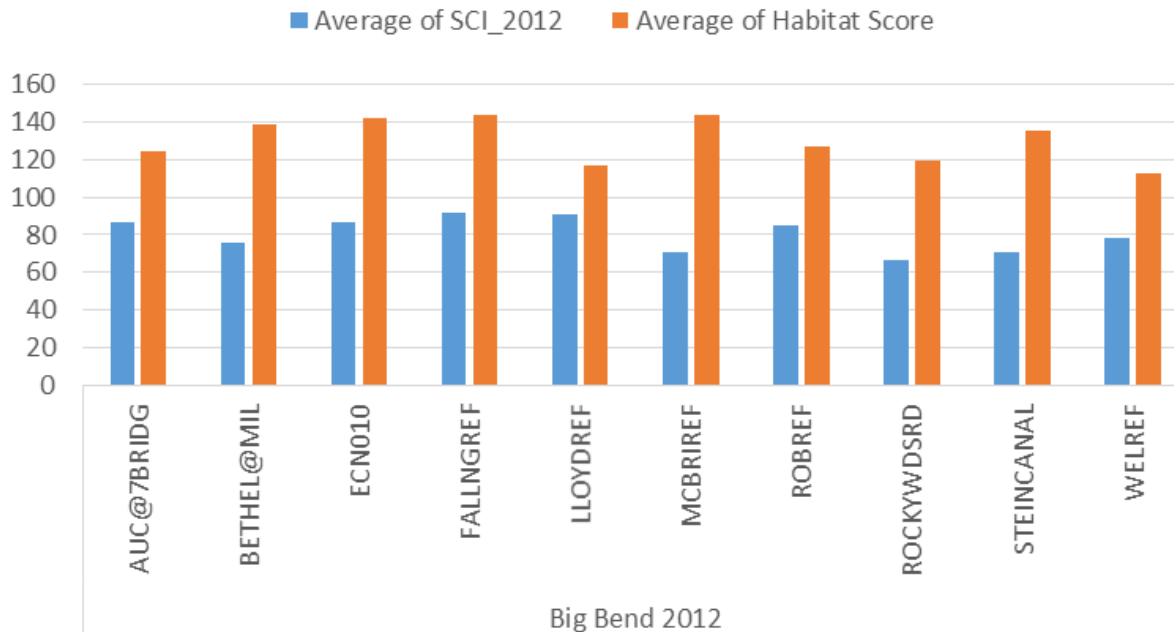
Summary SCI & HA Results



	Big Bend		Northeast		Panhandle		Peninsula	
	SCI	HA	SCI	HA	SCI	HA	SCI	HA
Average	80.5	130.4	62	113	71	134	62	108
Minimum	67	113	40.5	100	53	118	19	71
Maximum	92	144	78.5	131	87	154	81	150
St. Dev	9.05	11.85	14.02	12.38	10.92	9.29	19.08	34.26



Big Bend – SCI & HA Results



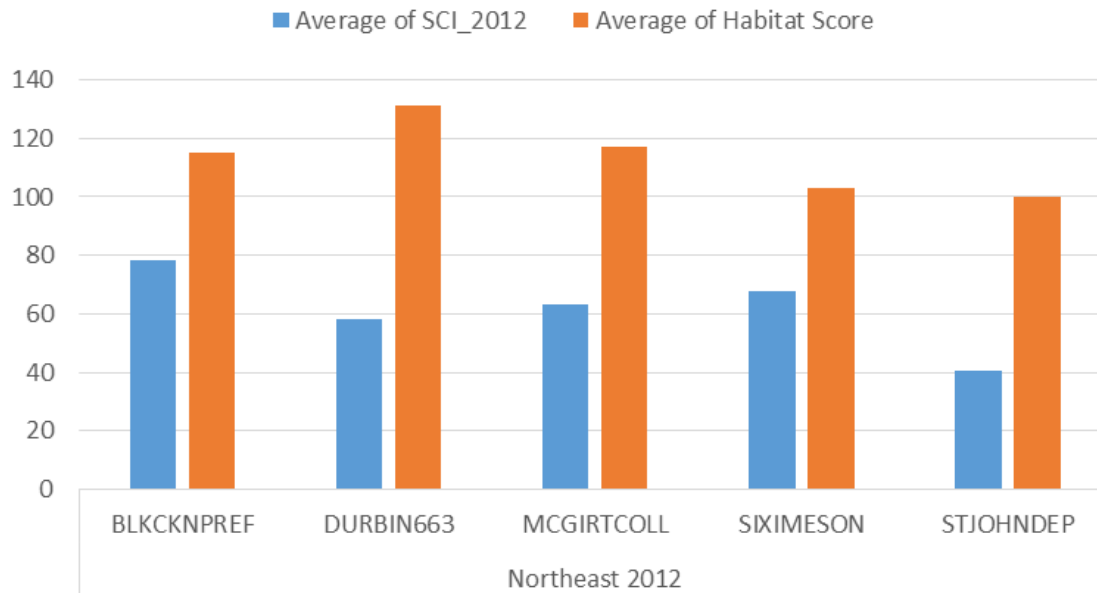
Big Bend	SCI	HA
Average	80.5	130.4
Minimum	67	113
Maximum	92	144
St. Dev	9.05	11.85



Bethel Mill Creek
May 6, 2015



NE – SCI & HA Results



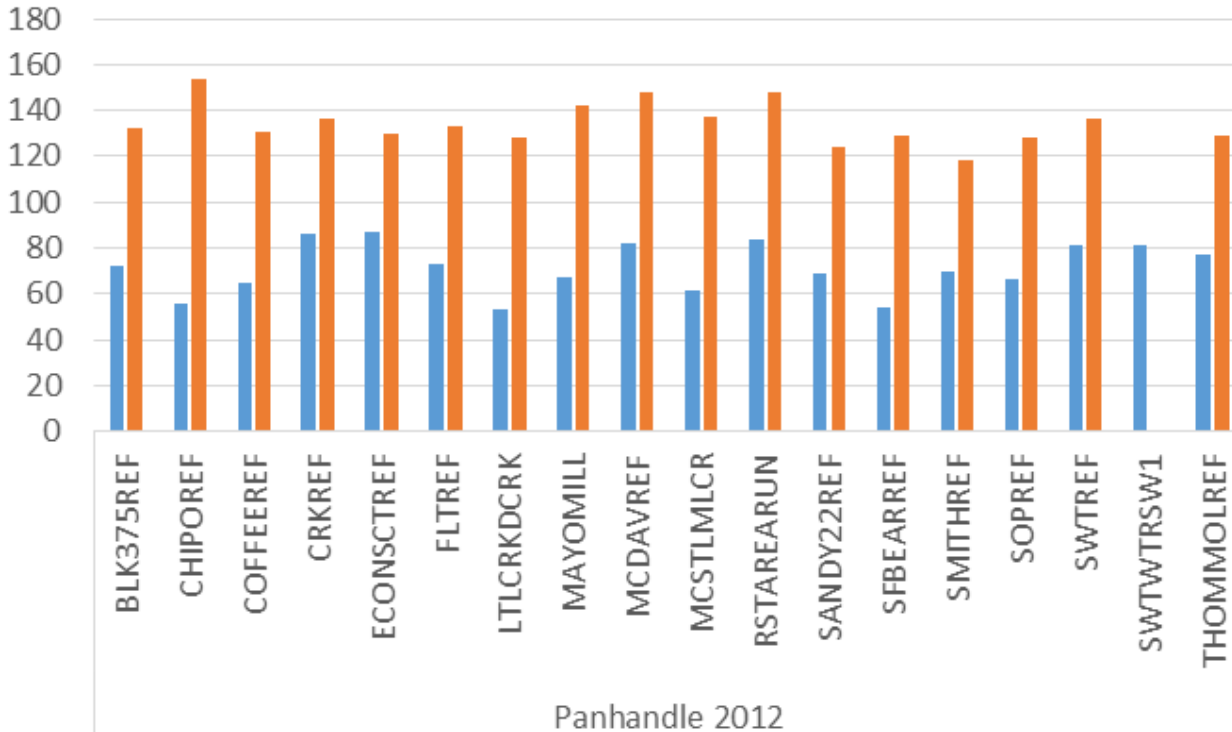
	Northeast	
	SCI	HA
Average	61.6	113.2
Minimum	40.5	100
Maximum	78.5	131
St. Dev	14.02	12.38

*STJOHNDEP – Deep Bottom Creek



Panhandle – SCI & HA Results

■ Average of SCI_2012 ■ Average of Habitat Score



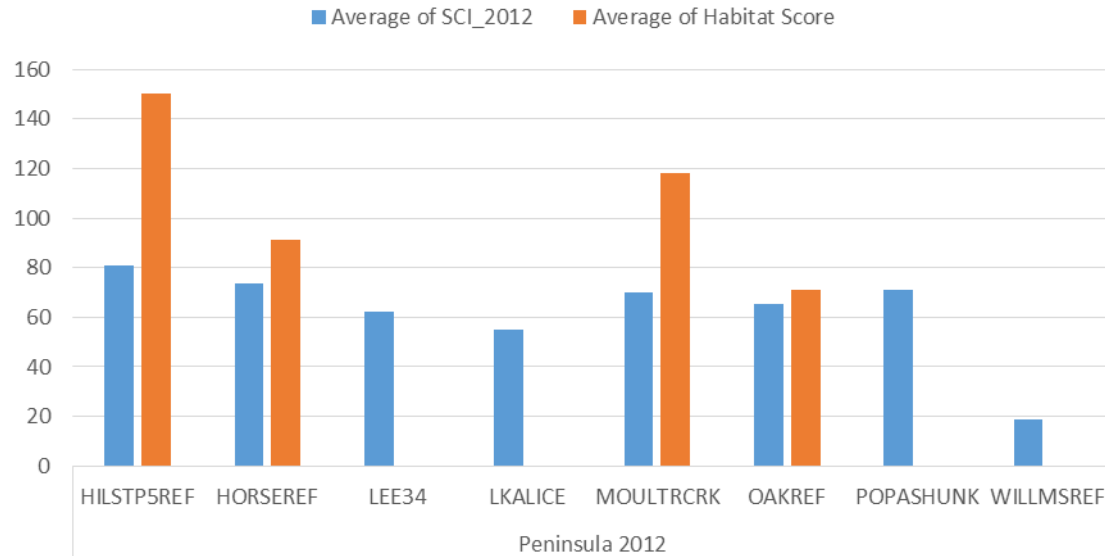
	Panhandle	
	SCI	HA
Average	71	134
Minimum	53	118
Maximum	87	154
St. Dev	10.92	9.29



Chipola River
August 19, 2015



Peninsula – SCI & HA Results



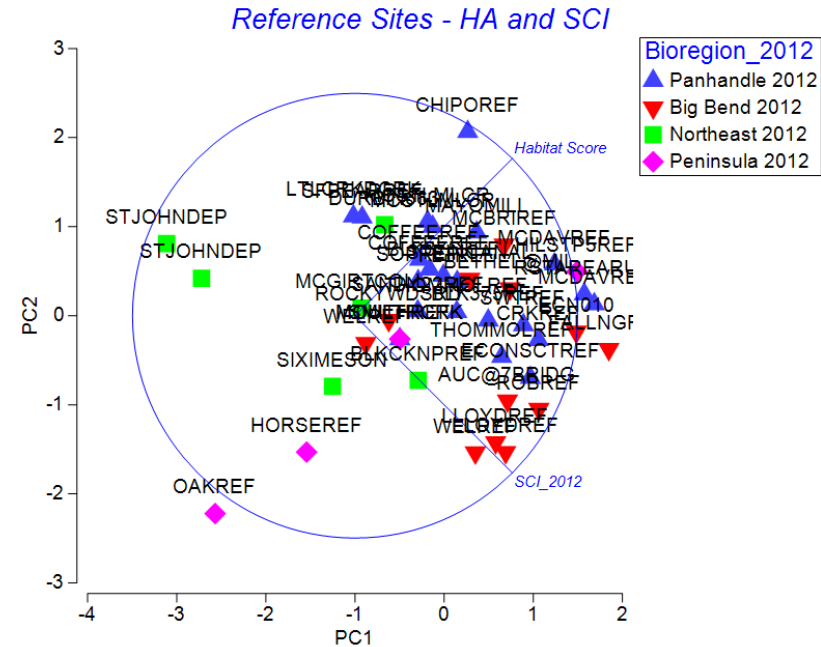
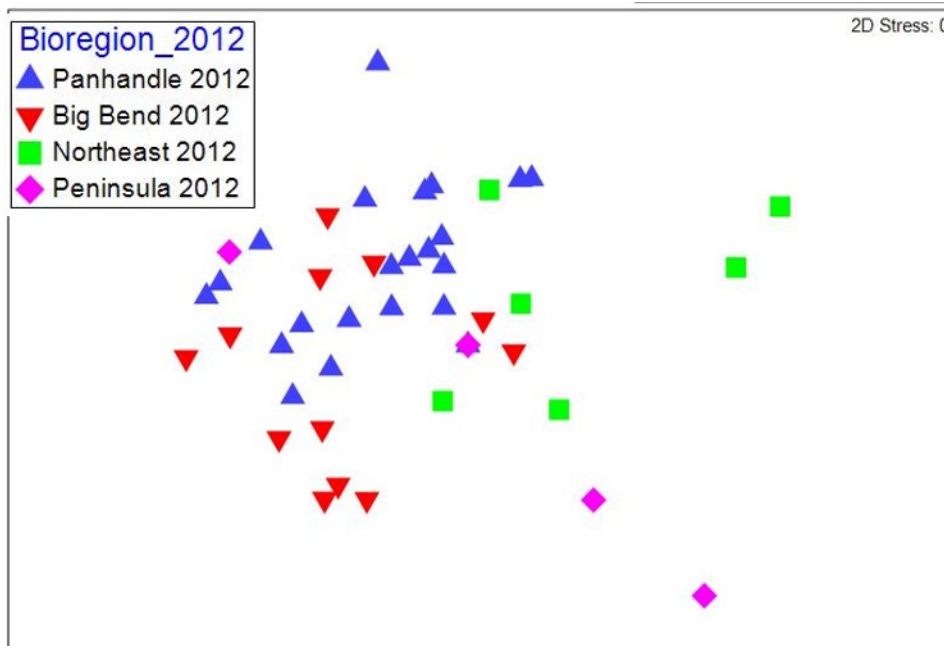
	Peninsula	
	SCI	HA
Average	62	108
Minimum	19	71
Maximum	81	150
St. Dev	19.08	34.26



Oak Creek
January 25, 2008



HA & SCI by Bioregion



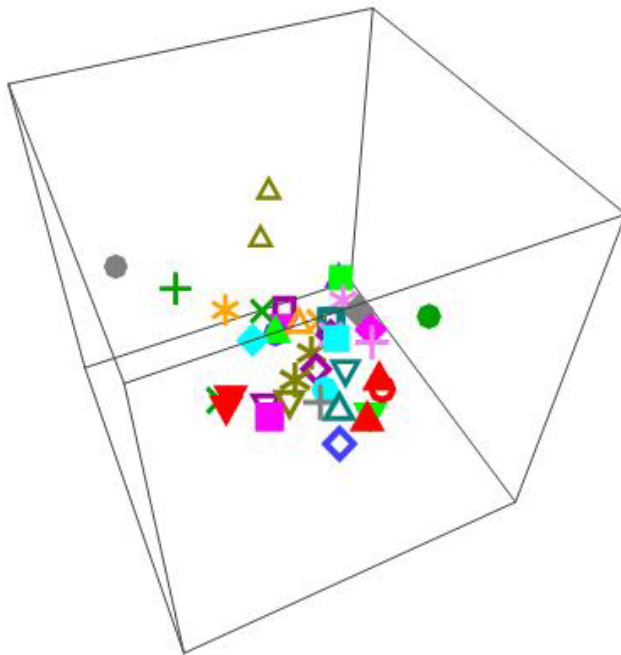


HA & SCI by Bioregion

Reference Sites - HA and SCI Non-metric MDS

Normalise
Resemblance: D1 Euclidean distance

3D Stress: 0.01



Station Nickname

▲ LTLCKDKCRK	+ HORSEREF
▼ LLOYDREF	× FLTREF
■ SFBEARREF	* SIXIMESON
◆ MAYOMILL	△ STJOHNDEP
● SWTREF	▽ BETHEL@MIL
+ CRKREF	□ MCGIRTCOLL
× WELREF	◇ FALLNGREF
* DURBIN663	○ HILSTP5REF
△ SANDY22REF	▲ MOULTRCRK
▽ ECONSCREF	▼ ROCKYWDSRD
□ COFFEEREF	■ STEINCANAL
◆ BLK375REF	● MCSTLMCLR
○ SMITHREF	● CHIPOREF
▲ MCDAVREF	+ MCBRIREF
▼ RSTAREARUN	× SOPREF
■ ROBREF	* THOMMOLREF
◆ BLKCKNPREF	△ ECN010
● OAKREF	▽ AUC@7BRIDG



SCI by Bioregion

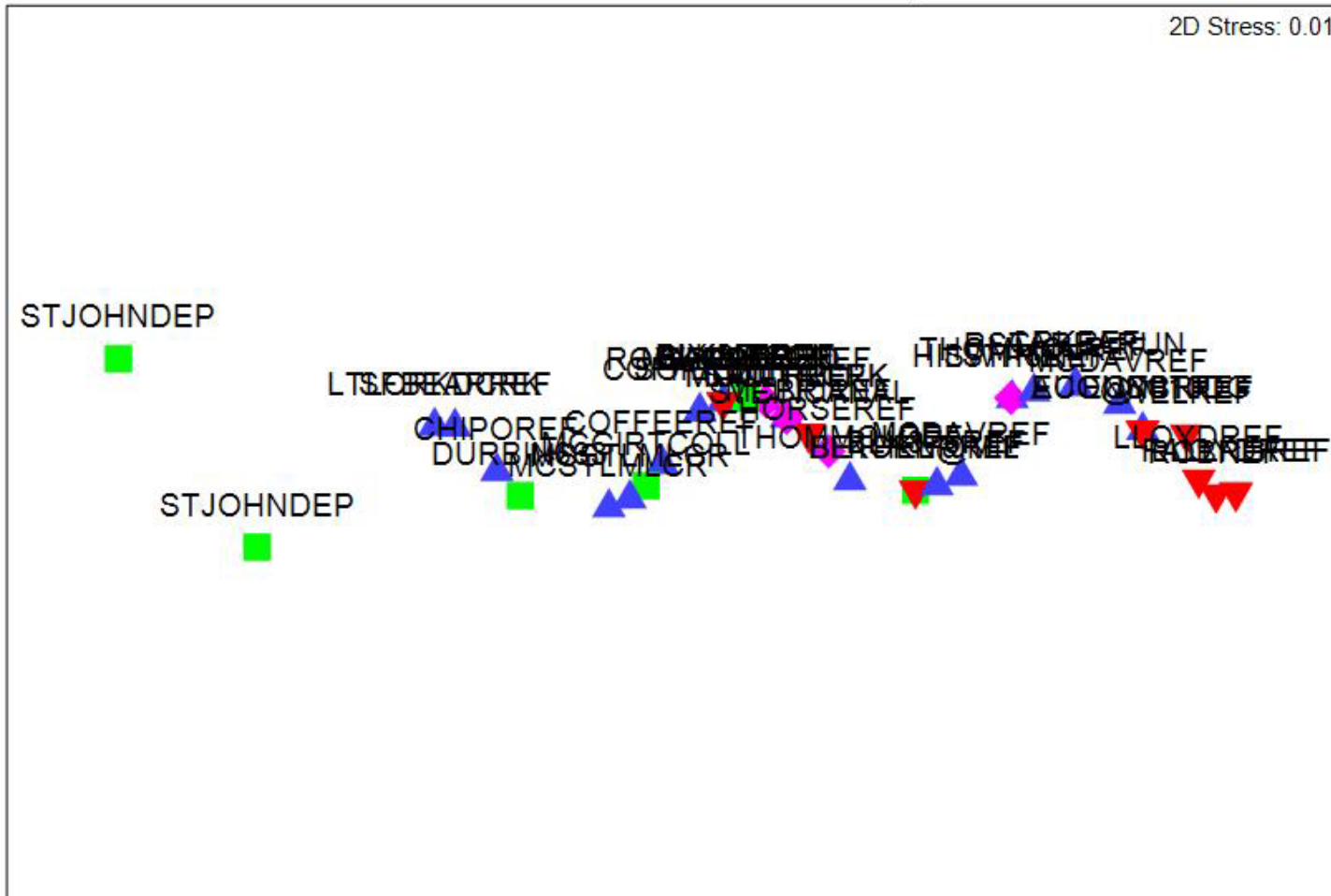
Non-metric MDS

Resemblance: D1 Euclidean distance

2D Stress: 0.01

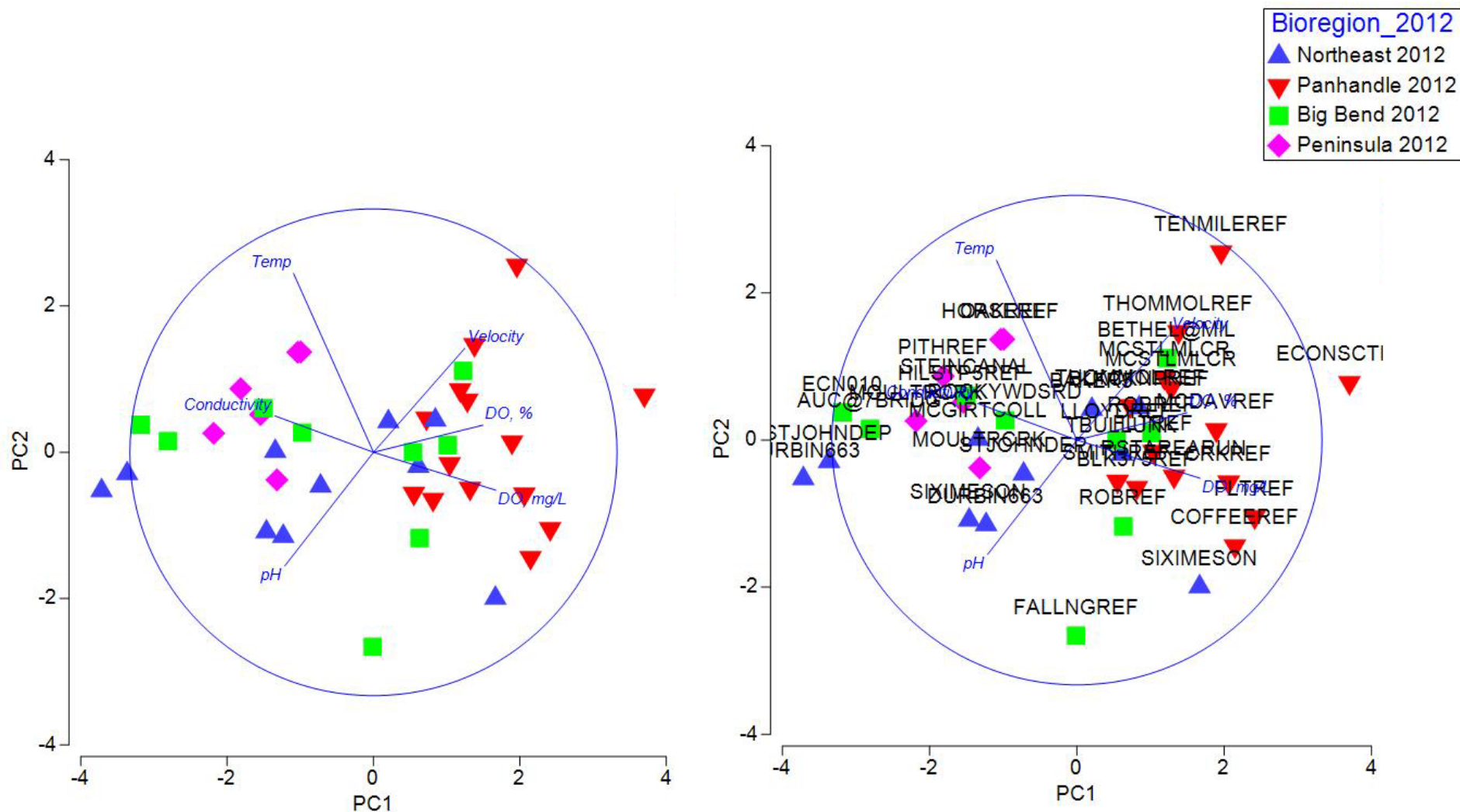
Bioregion_2012

- ▲ Panhandle 2012
- ▼ Big Bend 2012
- Northeast 2012
- ◆ Peninsula 2012





Differences in Phys/Chem





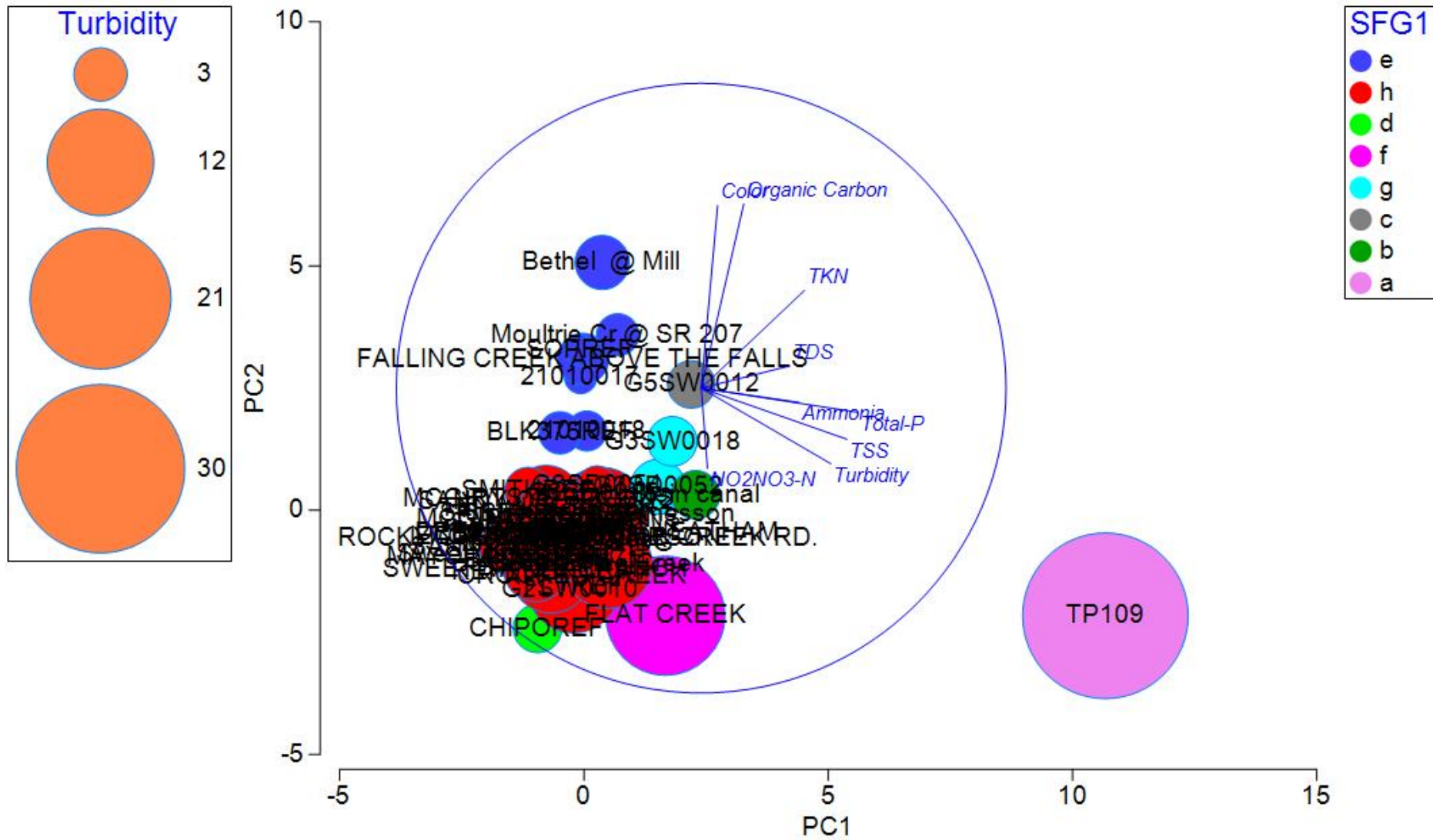
Differences in Selected WQ

Non-metric MDS





Turbidity is the key variable

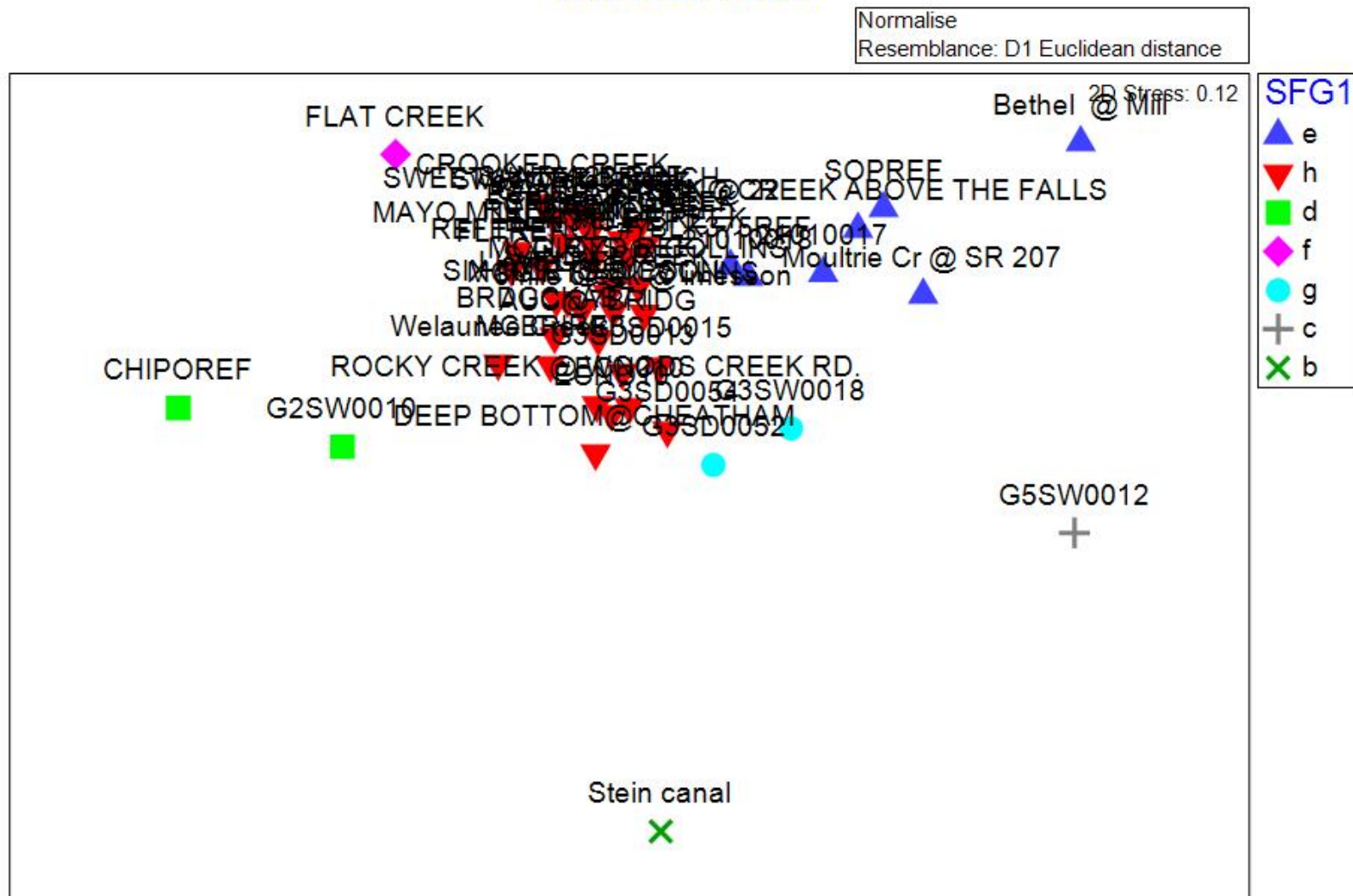


*TP109 = Williams Ref, SCI = 19



Differences in Selected WQ – TP109 removed

Non-metric MDS





TDS is the key variable

Non-metric MDS

Normalise
Resemblance: D1 Euclidean distance

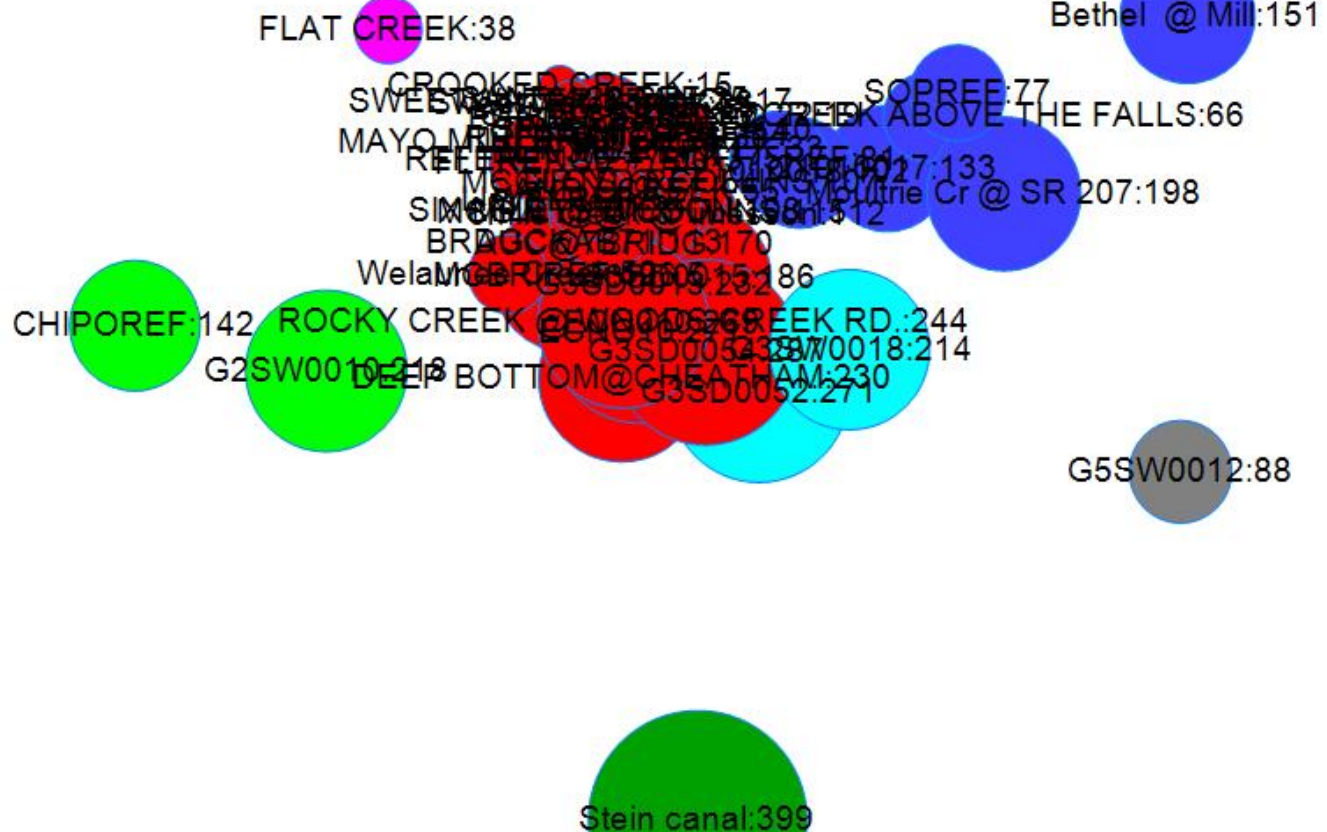
SFG1

- e
- h
- d
- f
- g
- c
- b

TDS

40
160
280
400

2D Stress: 0.12





Reminders

- Schedule and sample the entire suite every event
- Enter in your phys/chem and habitat assessment data in SBIO or SBIO(2) in a timely manner
- Document issues with photos



Aucilla River
November 3, 2015



Aucilla River
March 10, 2015



Know Your Insects



Todd



Linda



Chuck



Lisa



Carl



Mike

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