



Florida Department of Environmental Protection
Division of Environmental Assessment and Restoration

***Lakes Harney and Monroe
and Middle St. Johns
River BMAP
2015 Progress Report***

**Moira R. Homann
November 19, 2015**





Agenda

- Welcome and Introductions
- BMAP Annual Progress Report
- Water Quality Trends in the Basin
- Vegetation Survey Results
- Future Plans and Projects
- Public Comments
- Questions and Wrap Up



Annual Report Overview

- The third annual progress report on the Basin Management Action Plan (BMAP) activities
- Information was provided by the stakeholders on activities from September 1, 2014 through August 31, 2015
- Report includes updates on project implementation, and water quality and biological monitoring



Background on the BMAP

- The Total Maximum Daily Loads (TMDLs)
 - Total Nitrogen (TN) and Total Phosphorus (TP) adopted for the Lakes Harney and Monroe and the Middle St. Johns River (MSJR) Basin in December 2009
 - TP for Smith Canal adopted in September 2009
- BMAP Adopted in August 2012
- Detailed allocations made to responsible stakeholders to achieve 50% of the reductions over a 5-year period



Activities During the Reporting Period

- *City of Deltona*
 - Trainings
 - Green Industries (GI) - Best Management Practices (BMP) Training
 - Florida Stormwater, Erosion, and Sedimentation Control Inspector Training
 - Tivoli/Wheeling Forcemain to Rapid Infiltration Basin Stormwater Retention Ponds
 - Forcemain Completed - 11/2014
 - RIB Site Completed - 02/2015



Activities, continued

- *Seminole County*
 - Shoreline restoration efforts have successfully continued
 - Lake vegetative assessments continued on both Lake Monroe and Lake Harney
- *Florida Department of Agriculture and Consumer Services (FDACS)*
 - 7,463.1 acres of agriculture in best management practices (BMPs) enrolled in the basin
 - 547.5 acres more than in the previous reporting period
 - Estimated reductions of 7,793.9 lbs/yr of TN and 1,485.1 lbs/yr of TP for enrollment period
 - 458 lbs/yr more of TN and 53.5 lbs/yr more of TP



Activities, continued

- *St. Johns River Water Management District (SJRWMD)*
 - Completed a TP reduction planning project in the Deep Creek Planning Unit
 - Modeling completed to determine potential TP reductions and to optimize a smaller network of projects
- *Florida Department Of Transportation (FDOT)*
 - Construction activities for State Road (SR) 415 are ongoing and funding has been secured for projects identified on SR 44
 - Projects will provide treatment for the expanded roadway, and the existing roadway where no treatment previously existed



Ongoing Activities

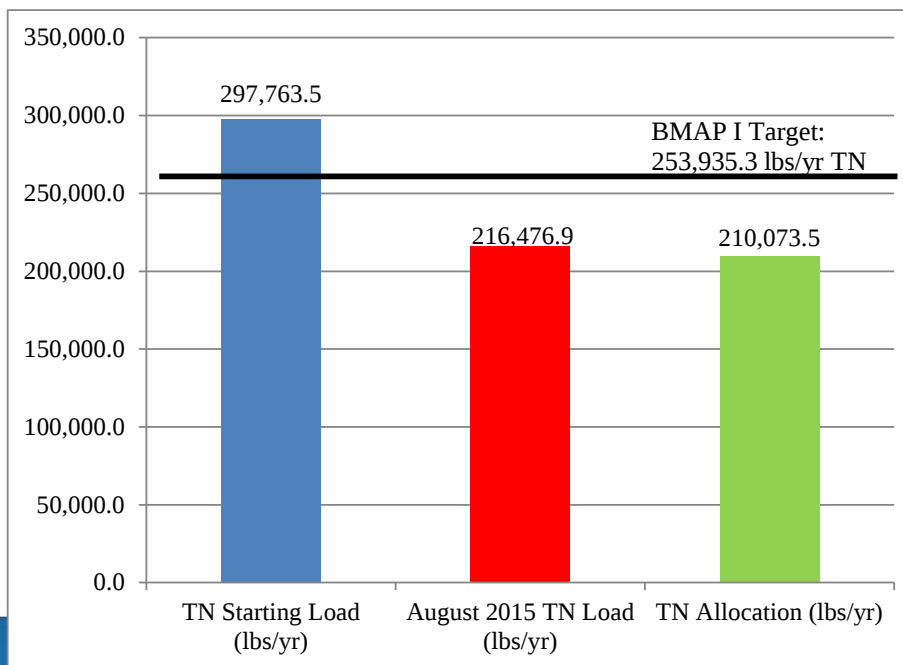
- Education and outreach
 - City of DeLand
 - City of Deltona
 - City of Lake Helen
 - City of Lake Mary
 - City of Orange City
 - City of Sanford
 - Seminole County
 - Volusia County
- Street sweeping
 - City of Lake Mary
 - City of Sanford
 - FDOT
 - Seminole County
 - Turnpike Authority
 - Volusia County



Progress to the TN TMDL

- Reductions

- Reductions from projects completed during the third annual BMAP reporting period: 8,252 lbs/yr of TN
- Total BMAP project reductions to date: 81,286.6 lbs/yr of TN
- Required TN reduction for the first BMAP iteration: 43,828.2 lbs/yr
- Reductions are 92.7% of the required TN reductions to meet the TMDL
- Reductions to date are greater than the reductions required for the first BMAP iteration

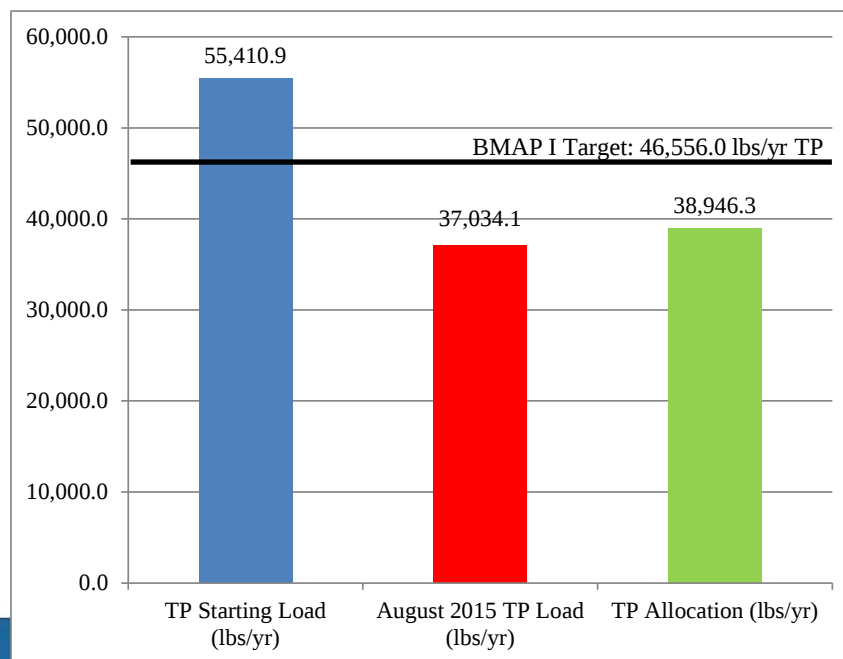




Progress to the TP TMDL

- Reductions

- Reductions from projects completed during the third annual BMAP reporting period: 1,538.6 lbs/yr of TP
- Total BMAP project reductions to date: 18,376.8 lbs/yr of TP
- Required TN reduction for the first BMAP iteration: 8,854.9 lbs/yr
- Reductions are 111.6% of the required TP reductions to meet the TMDL
- Reductions to date are greater than the reductions required for the first BMAP iteration





Water Quality Monitoring

- The monitoring plan consists of the following:
 - Ambient water quality sampling
 - Storm event sampling
 - Biological monitoring
- Information gathered through the monitoring plan:
 - Measures progress toward achieving the TN and TP TMDLs
 - Provides a foundation for continued improvement in cost-effective project implementation



Water Quality Monitoring (cont'd.)

- All responsible stakeholders participated in the monitoring plan in the third year of BMAP implementation

ENTITY
City of Deltona
Seminole County
St. Johns River Water Management District
Volusia County

- Local stakeholders continue to use their existing water atlas or the Florida storage and retrieval (STORET) database platform to store and disseminate data



Biological Monitoring

- *Seminole County*
 - Lake Monroe and Lake Harney
 - Lake Vegetation Index (LVI)
 - Shannon-Weaver Index
 - Smith Canal
 - Stream Condition Index (SCI)
 - Biological and vegetative monitoring data uploaded to STORET via the Seminole Watershed Atlas
- *SJRWMD*
 - Continued its phytoplankton sampling in the basin



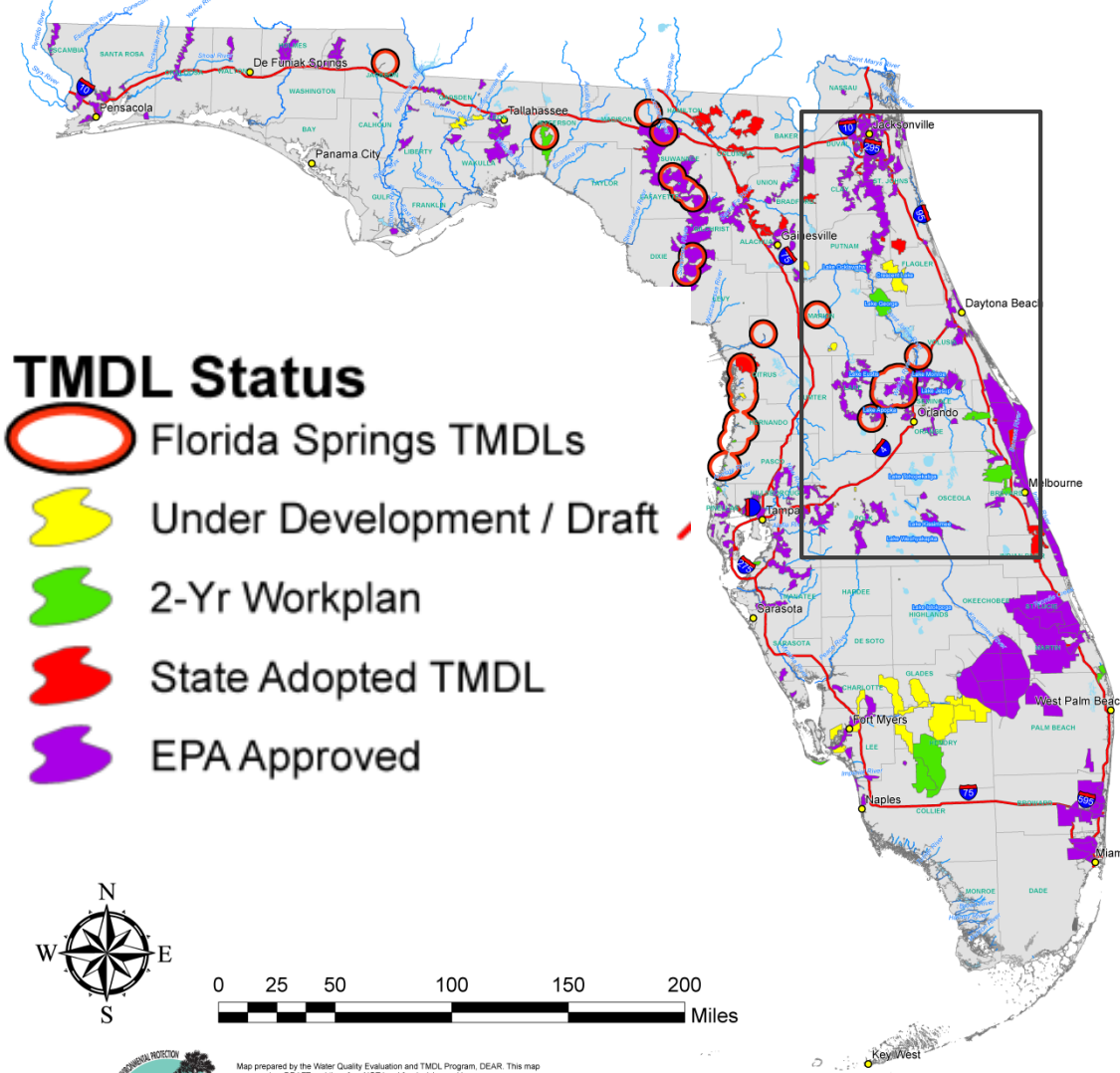
Questions?

Water Quality Summary Middle St. Johns BMAP Annual Meeting 2015

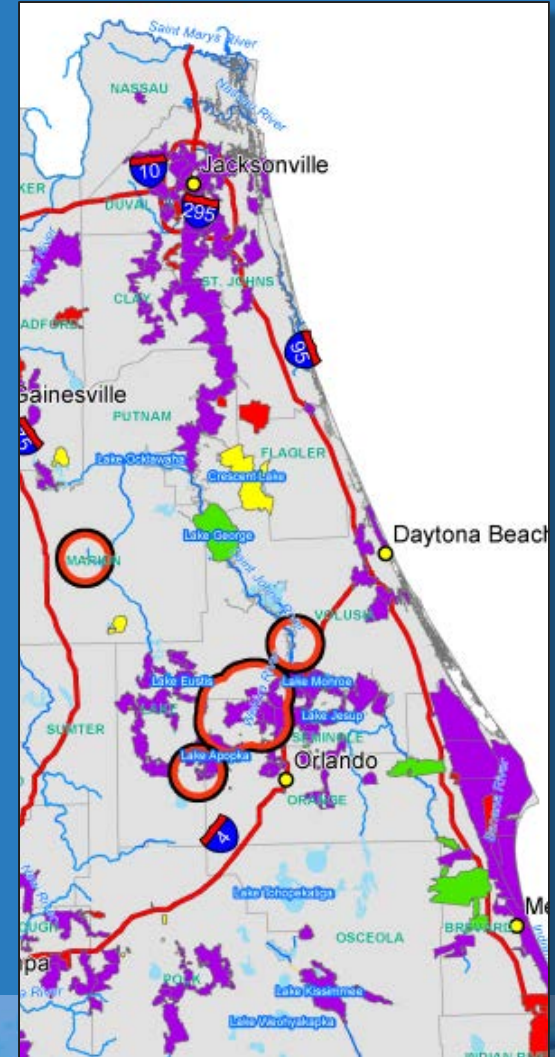
**Overview of SJRWMD WQ
Monitoring Data
11/19/15**



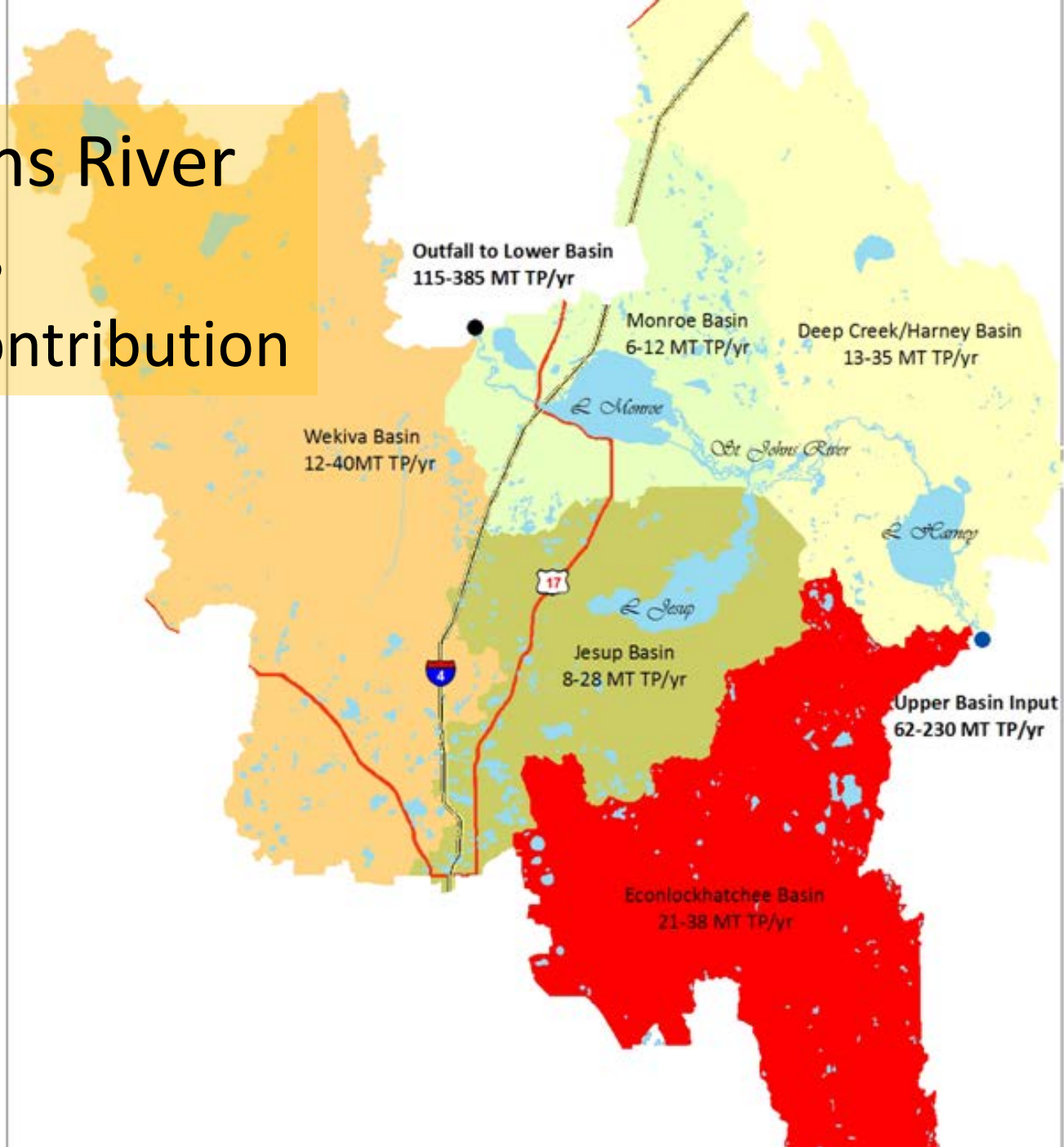
TMDLs in the State of Florida



St. Johns River TMDL Status

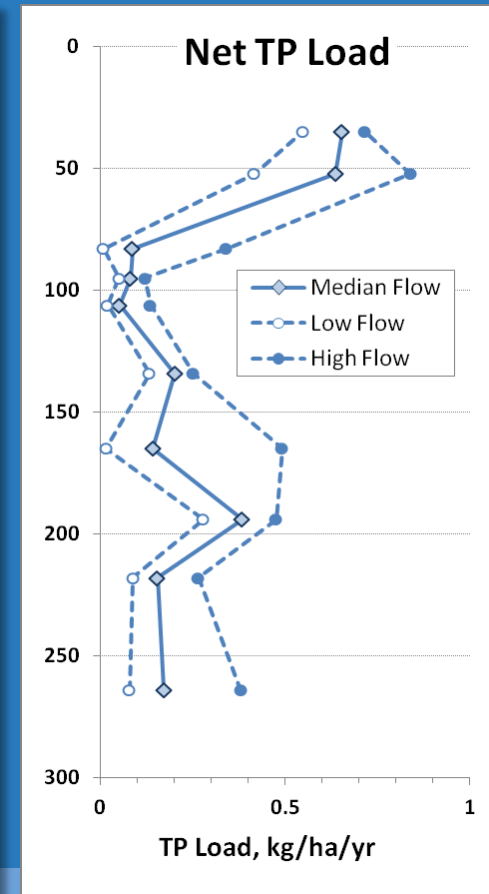
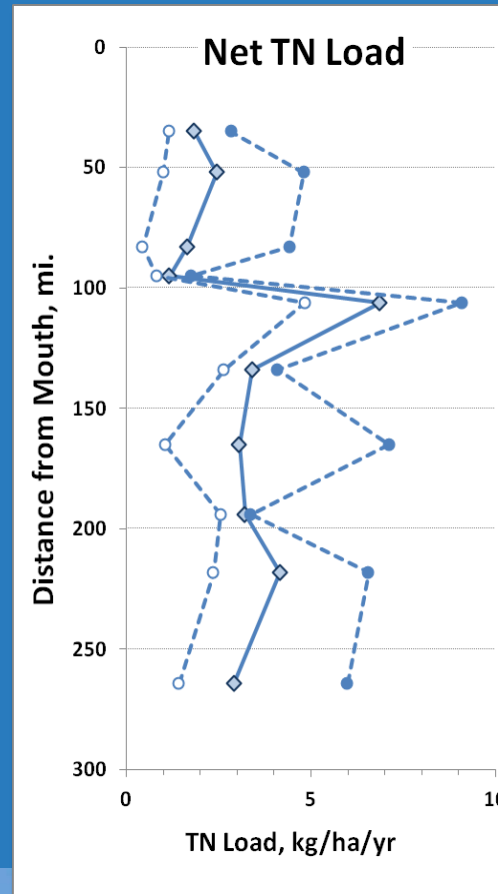
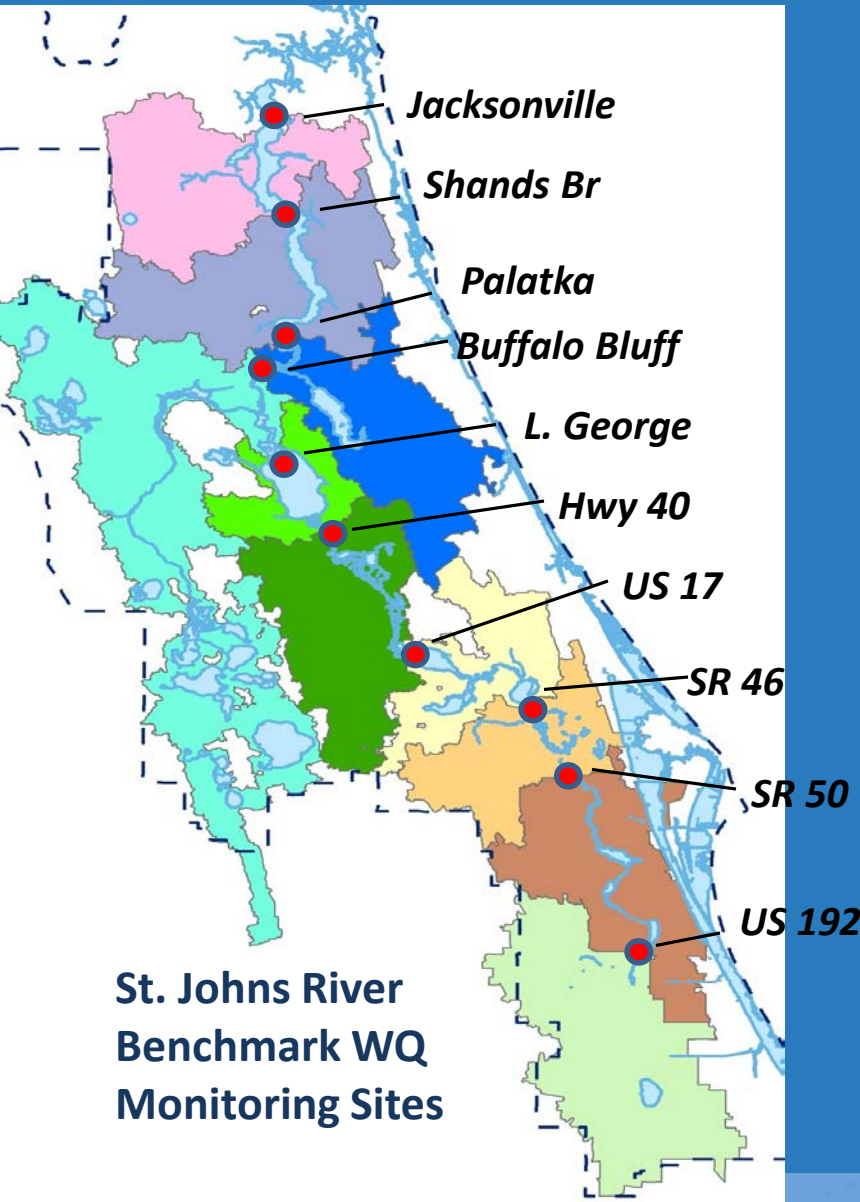


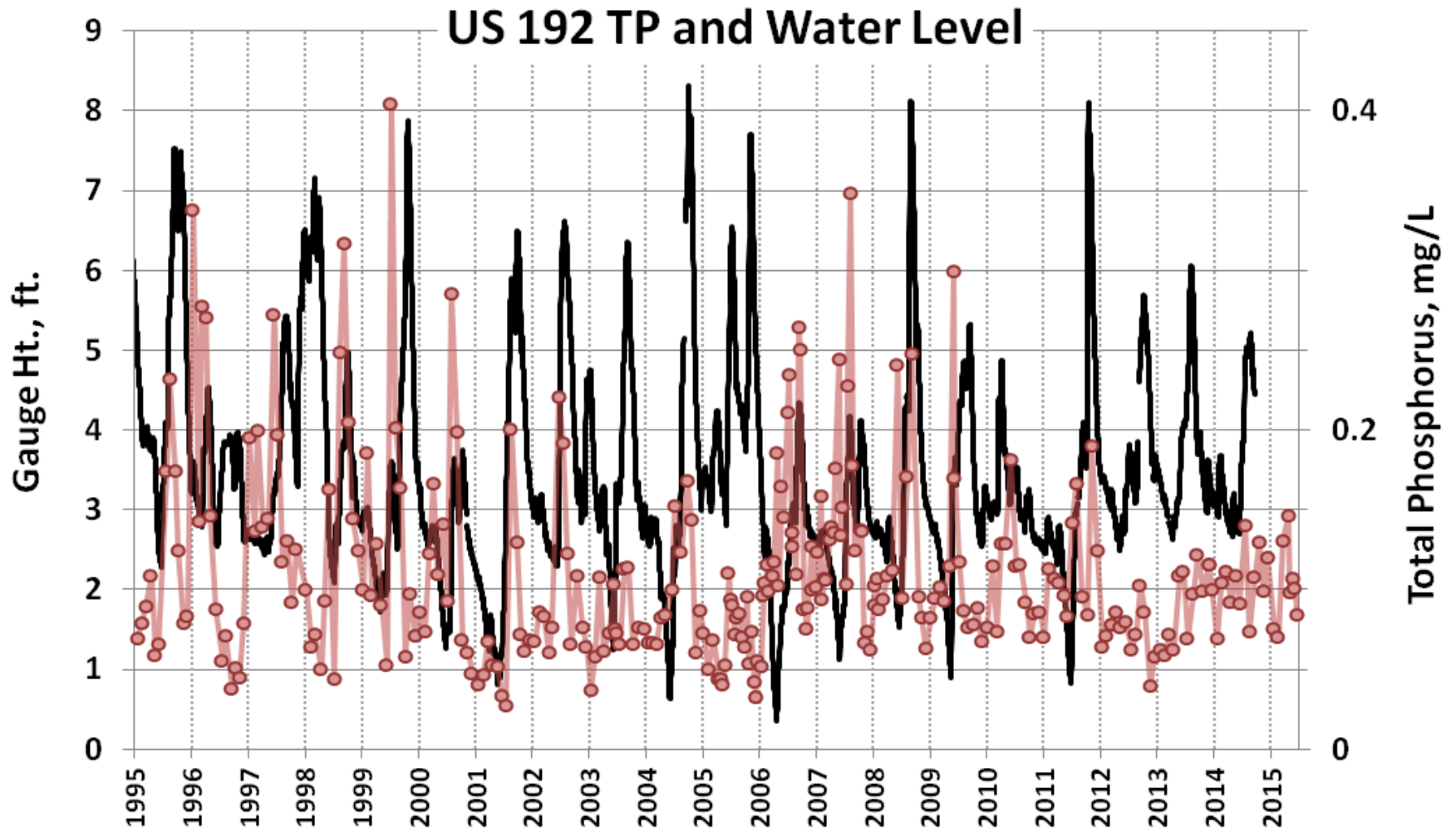
Middle St. Johns River Basin TP Loads Calculated by Contribution



St. Johns River Segment Net Areal Loading 2004 – 2013

Calculated on River Load



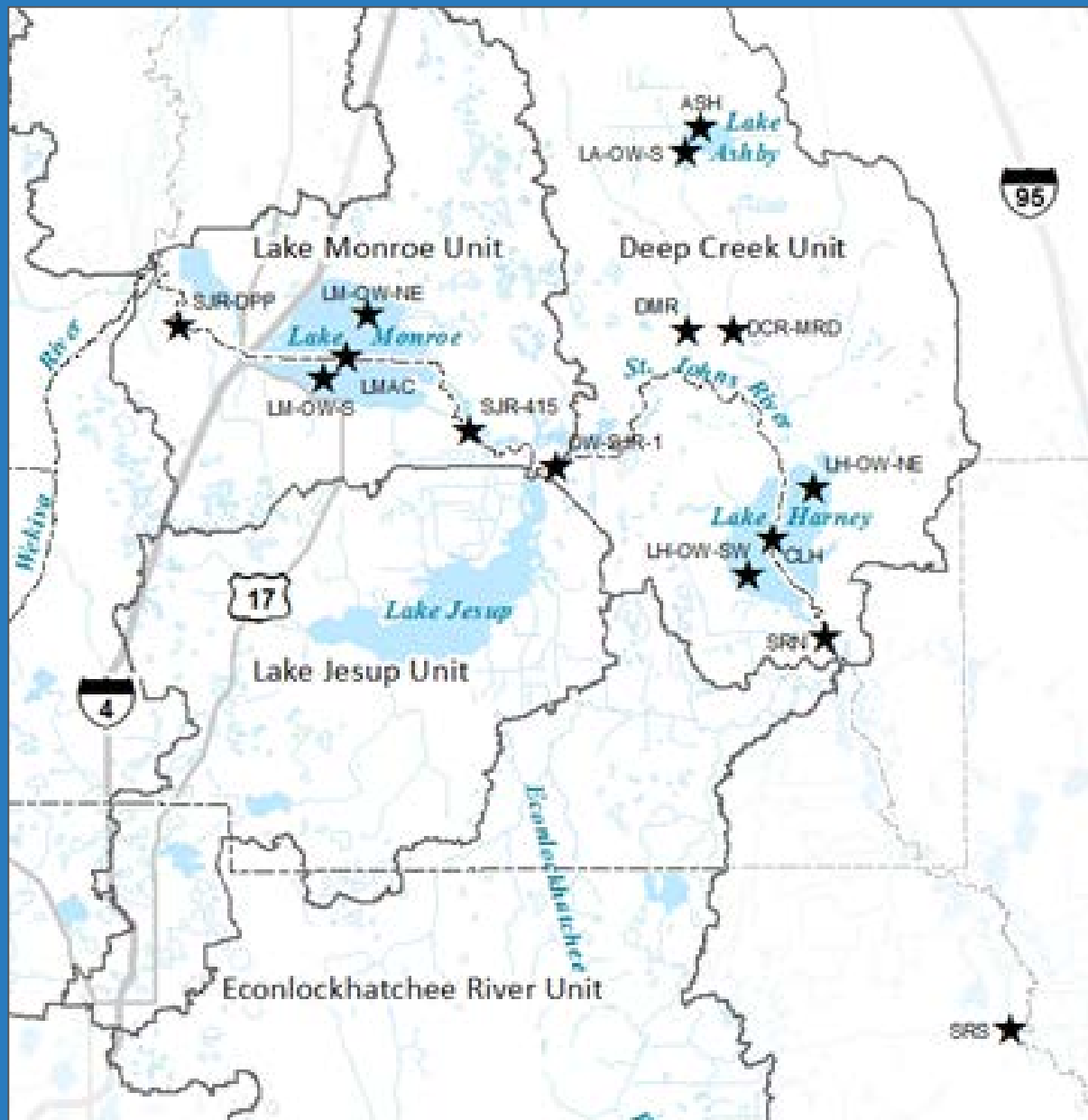


Changes & Emphasis for 2016

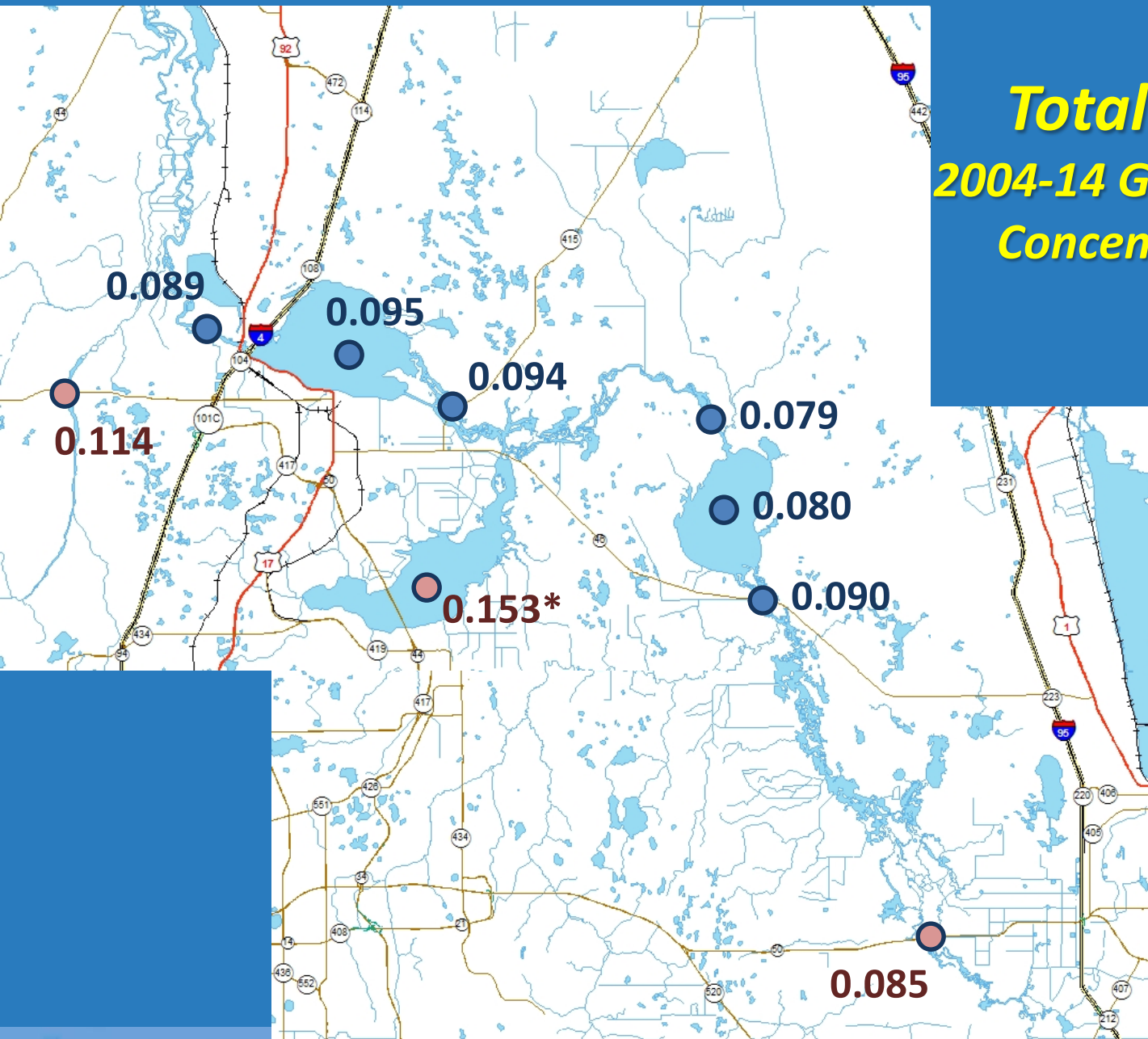
- Benchmark river monitoring frequency doubled
- USJ – Group 3 Cycle 3 in 2016
- Wekiva River
 - BMAP Completed
 - MFL draft report pending
- Lake Jesup
- Lake George TMDL
 - *The wildcard?*



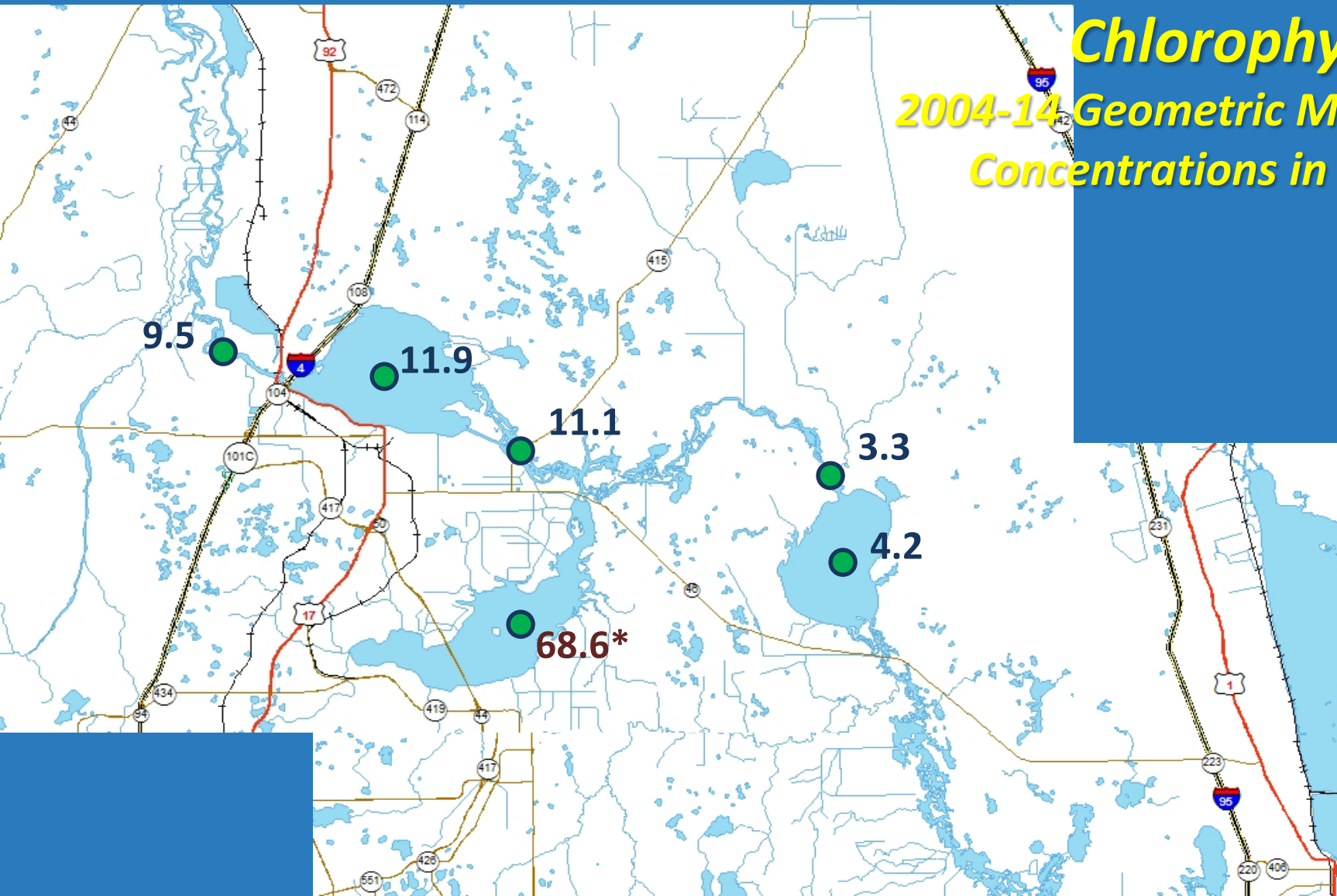
SJRWMD Surface Water Quality Monitoring Sites Assessed for the 2015 BMAP Review



Total Phosphorus
2004-14 Geometric Means
Concentrations in mg/L



Chlorophyll-a
2004-14 Geometric Means
Concentrations in $\mu\text{g/L}$



2015 Status & Trends Assessment – Chlorophyll-a

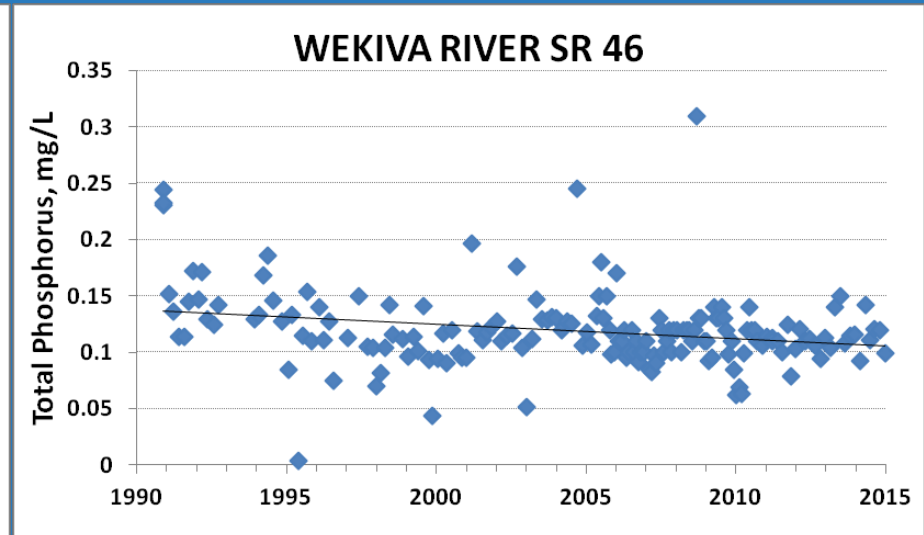
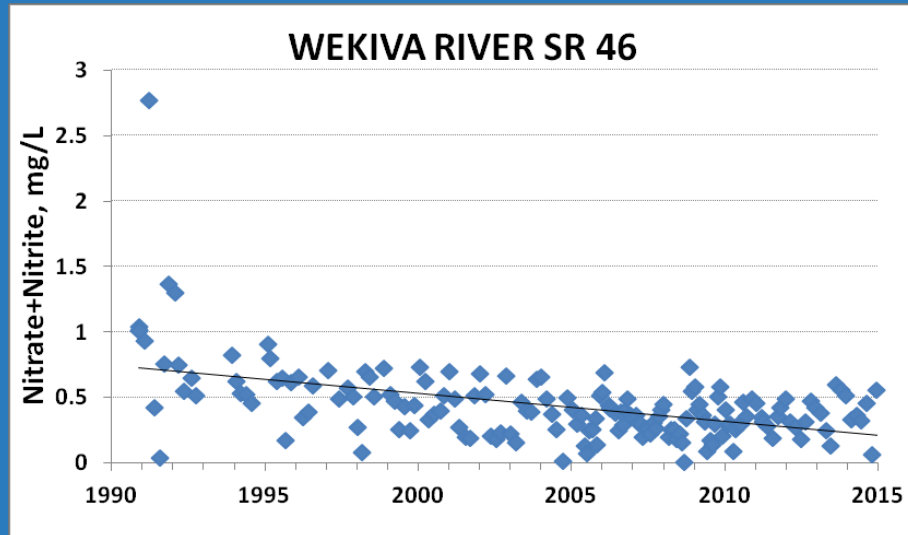
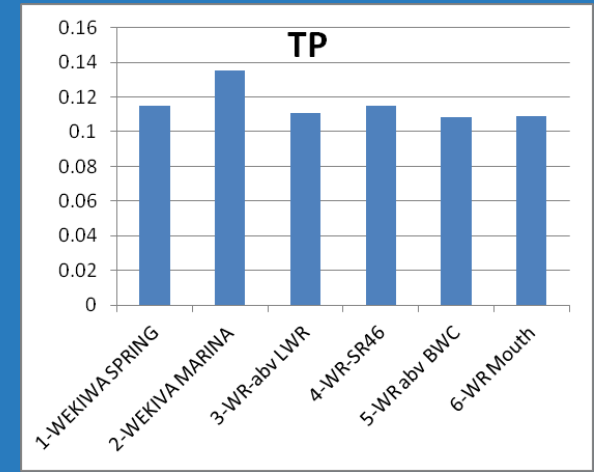
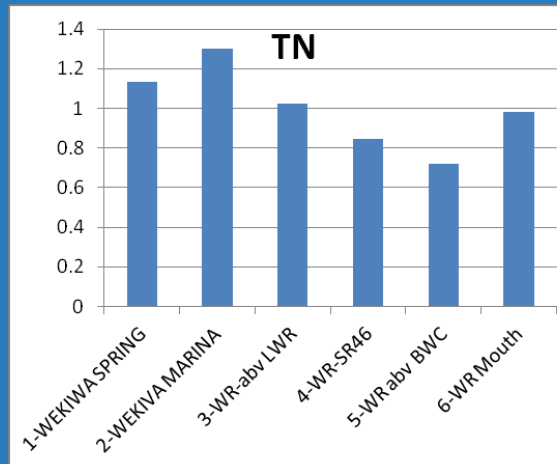
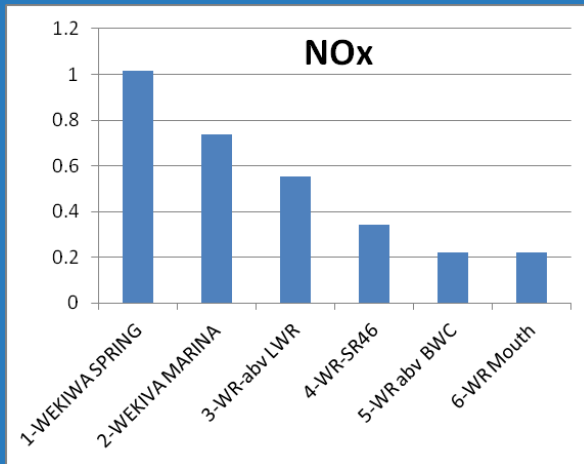
Station	Description	p50	qtrend	sen_slope
OW-SJR-1	Mid SJR east of Barge Canal and east of JJ Fish Camp	2.685	Decreasing	-0.0944
ASH	CENTER OF LAKE ASHBY	2.964	Increasing	0.2107
BWC44	BLACKWATER CREEK AT HWY 44	0.507	Increasing	0.0175
SJR-415	St. Johns River at 415 Bridge at Sanford	9.345	Increasing	0.7
SJR-DPP	St. Johns River downstream of Power Plant	9	Increasing	0.5313
02233200	LITTLE ECONLOCKHATCHEE R NR UNION PARK_ FLA.	0.98	Stable	0.0048
02235000	WEKIVA RIVER NEAR SANFORD	1.175	Stable	-0.026
20010137	LITTLE WEKIVA RIVER AT HWY 434	3.182	Stable	-0.0674
BWCCPB	BLACKWATER CREEK AT CARTER PROP BRIDGE	0.667	Stable	0.0027
CLH	Center of Lake Harney	5.834	Stable	-0.1277
DMR	Deep Creek Diversion at Maytown Road	0.619	Stable	-0.007
LMAC	LAKE MONROE AT CENTER	20.225	Stable	-0.4656
OW-2	Lk Jesup off Grassy Point	57.5	Stable	0.2862
OW-4	Lk Jesup W of bridge btwn Whites Lndg and Bird Island	77.821	Stable	1.636
OW-6	Lk Jesup off center of Far W Arm	70.6	Stable	1.7742
SJR-OLH	Lake Harney Outlet - St. Johns River	2.136	Stable	0.0273
SRN	SJR near SR46 bridge south of Lake Harney	2.2	Stable	0.001
WIN	LAKE WINNEMISSETT	1.327	Stable	0.0071



2015 Status & Trends Assessment – TP

station	description	p50	qtrend	sen_slope
Middle St. Johns Basin				
02233200	LITTLE ECONLOCKHATCHEE R NR UNION PARK_ FLA.	110	Decreasing	-3
ASH	CENTER OF LAKE ASHBY	97.85	Decreasing	-5.249
DCR-MRD	Deep Creek at Maytown Road	134	Decreasing	-6.3667
T-3	Six Mile Creek at Sanford Ave Canal NE of Lk Jesup	145.3	Decreasing	-5
Green Springs	Green Springs near Enterprise	80.75	Increasing	1.0062
SJR-OLH	Lake Harney Outfall - St. Johns River	70.7	Increasing	1.2498
02235000	WEKIVA RIVER NEAR SANFORD	115	Stable	-0.1038
20010137	LITTLE WEKIVA RIVER AT HWY 434	145.934	Stable	-1.6683
BWC44	BLACKWATER CREEK AT HWY 44	54.15	Stable	0.215
BWCCPB	BLACKWATER CREEK AT CARTER PROP BRIDGE	53	Stable	0.0833
CLH	Center of Lake Harney	80.1	Stable	1.5749
DMR	Deep Creek Diversion at Maytown Road	63.1	Stable	-0.1961
ECH	Econ River at Snowhill Road (SR 426)	90	Stable	-0.9438
ER-420	Econ River at Lake Pickett Rd (SR 420)	67	Stable	0.525
Gemini Springs	Gemini Springs near Debary	78.3	Stable	-0.2051
LER-LBB	Little Econ River at Lockwood Blvd Bridge	98.15	Stable	-1.3529
LMAC	LAKE MONROE AT CENTER	87.724	Stable	0.8739
Miami Springs	Miami Springs near Longwood	99.9	Stable	-1.4538
OW-2	Lk Jesup off Grassy Point	164.55	Stable	-2.0692
OW-4	Lk Jesup W of bridge btwn Whites Lndg and Bird Island	153	Stable	-1.5571
OW-6	Lk Jesup off center of Far W Arm	140.4	Stable	-1.3567
OW-SJR-1	Mid SJR east of Barge Canal and east of JJ Fish Camp	79.2	Stable	-0.2167
Palm Springs - Seminole	Palm Springs near Longwood	118	Stable	0.3402
Rock Springs	Rock Springs near Apopka	81	Stable	0.4592
Sanlando Springs	Sanlando Springs near Longwood	182.1	Stable	1.336
SJR-415	St. Johns River at 415 Bridge at Sanford	96	Stable	1
SJR-DPP	St. Johns River downstream of Power Plant	88.55	Stable	-0.8222
SRN	SJR near SR46 bridge south of Lake Harney	89.5	Stable	-0.5665
Starbuck Spring	Starbuck Spring near Longwood. Formerly Sheppard Spring	150	Stable	0
Wekiwa Springs	Wekiwa Springs near Apopka	119.05	Stable	0.012
WIN	LAKE WINNEMISSETT	8.65	Stable	0.1653
Upper St. Johns Basin				
SRS	Seminole Ranch South boundary at SR 50 in SJR	80.5	Stable	-0.6318

WEKIVA River Longitudinal and Temporal Trends



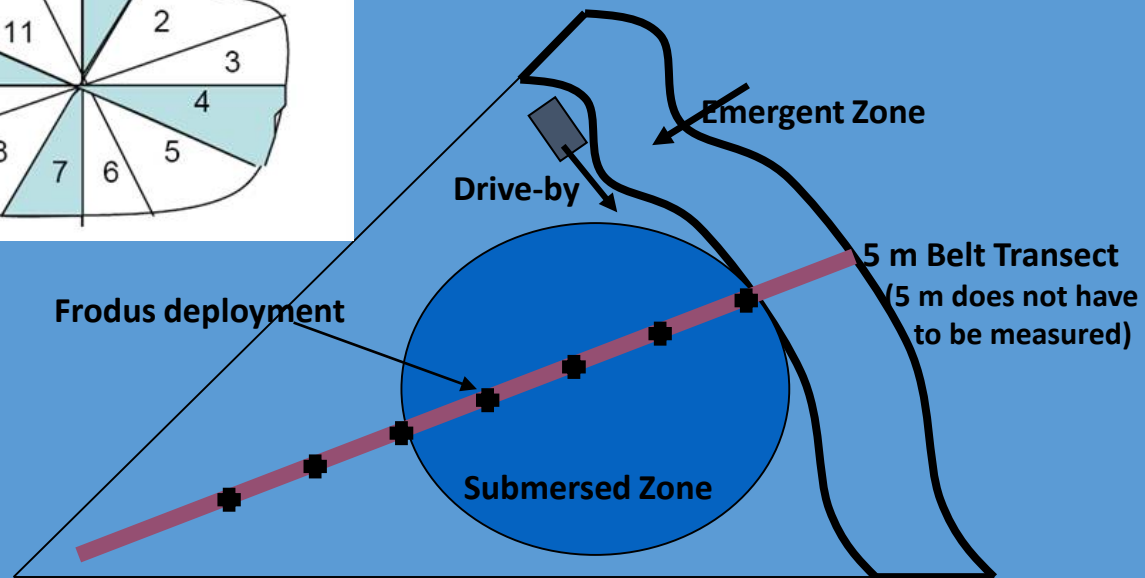
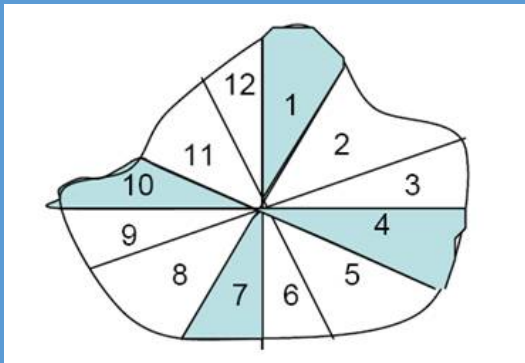
LVI Status for Mid St. John's BMAP

Thomas Calhoun

Seminole County Lake Management Program



LVI Sampling (FS 7310)

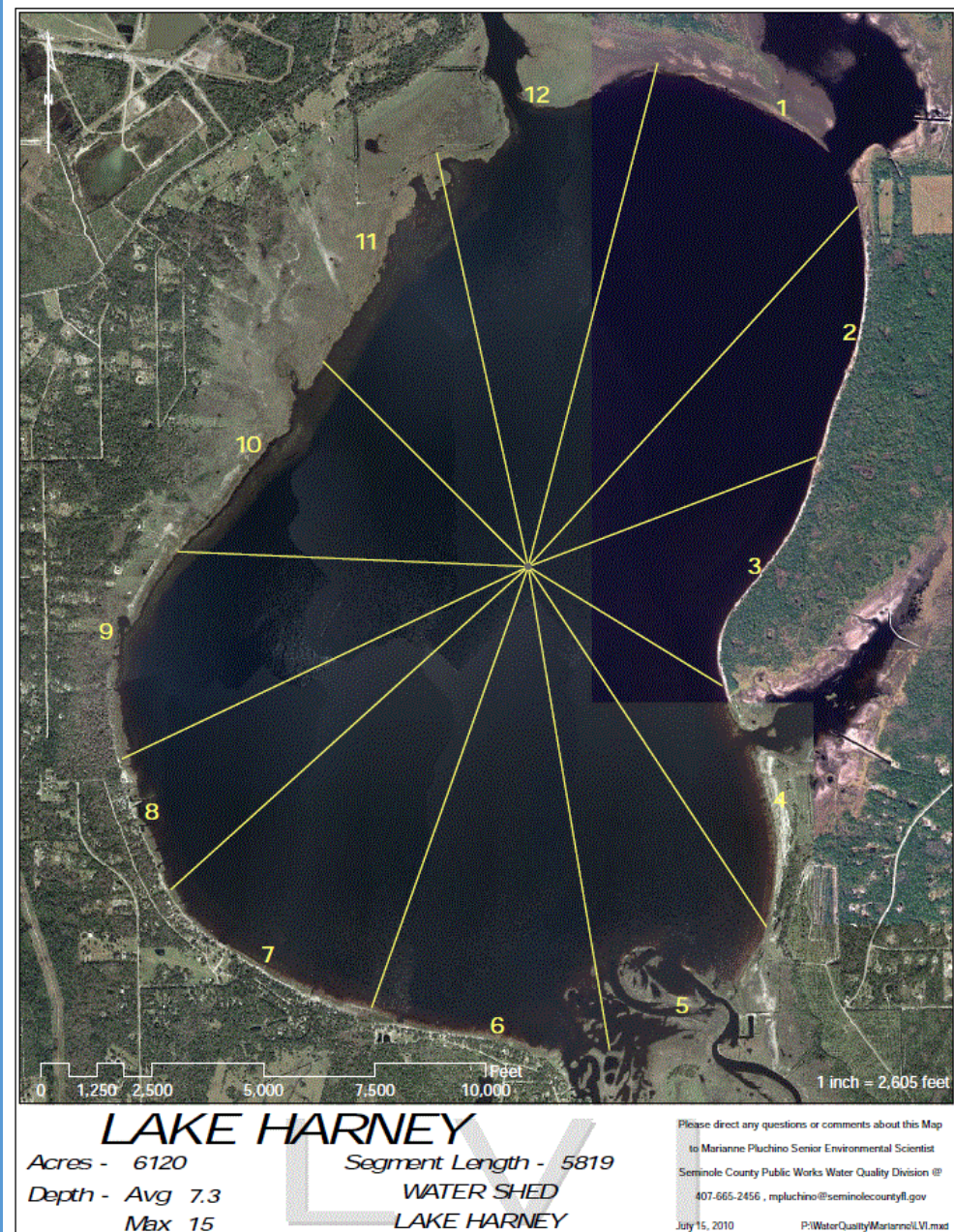


LVI Bioassessment

	Exceptional	Healthy	Impaired
LVI	≥ 78	43-77	≤ 42

Lake Harney Vegetation Sampling (LVI) (collected annually)

2007: 60 healthy
2008: 63 healthy
2009: 48 healthy
2010: 46 healthy
2011: 80 exceptional
2012: 65 healthy
2013: 56 impaired
2014: 47 healthy



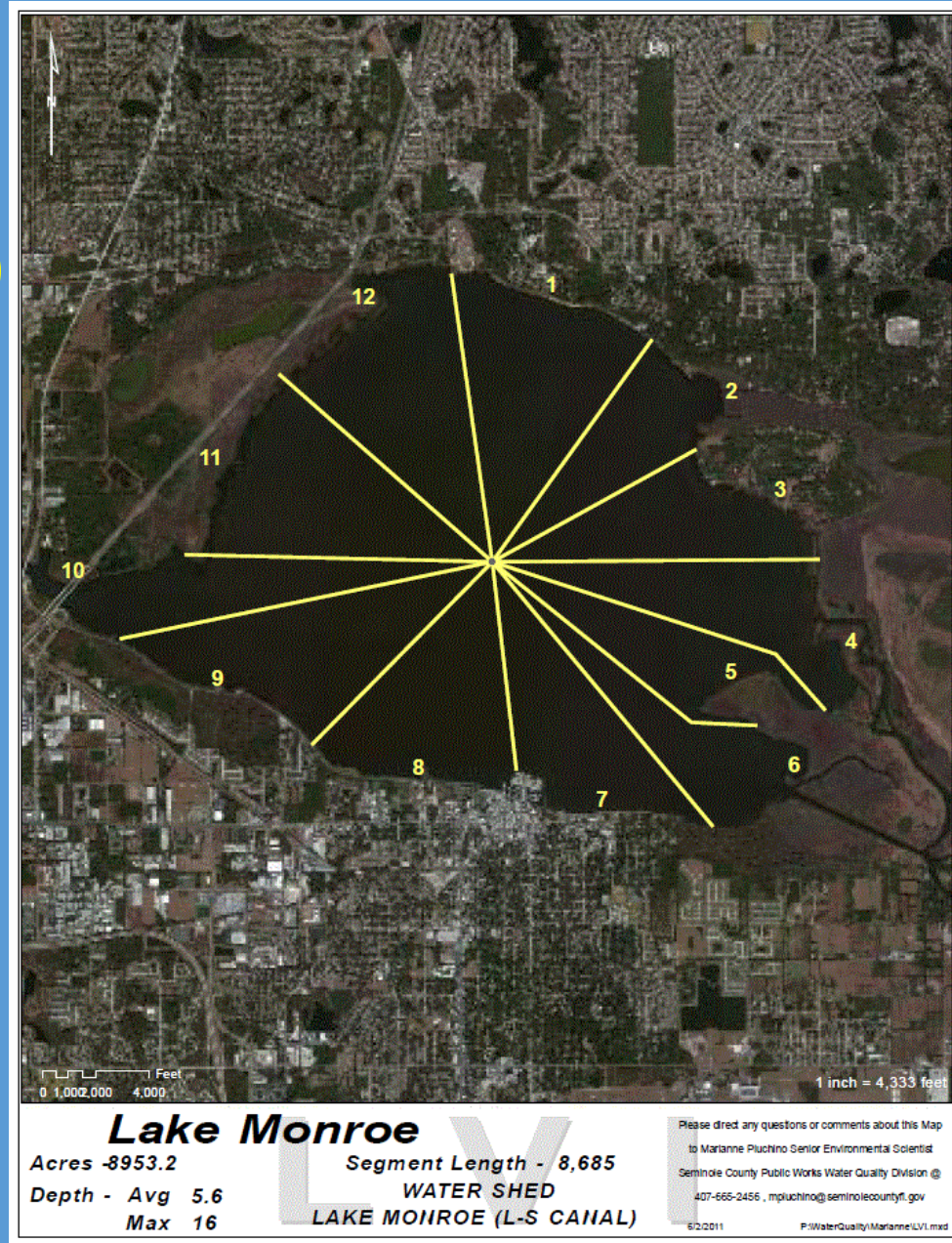
Lake Harney Observations

- Hydrilla seasonal fluctuations
- Creeping water primrose first observation 2012
- Eelgrass dominant vegetation
- Eelgrass recent surveys show reduction in biomass



Lake Monroe Vegetation Sampling (LVI) (collected annually)

2008: 35 impaired
2009: 36 impaired
2010: 30 impaired
2011: 42 impaired
2012: 39 impaired
2013: 44 healthy
2014: 23 impaired



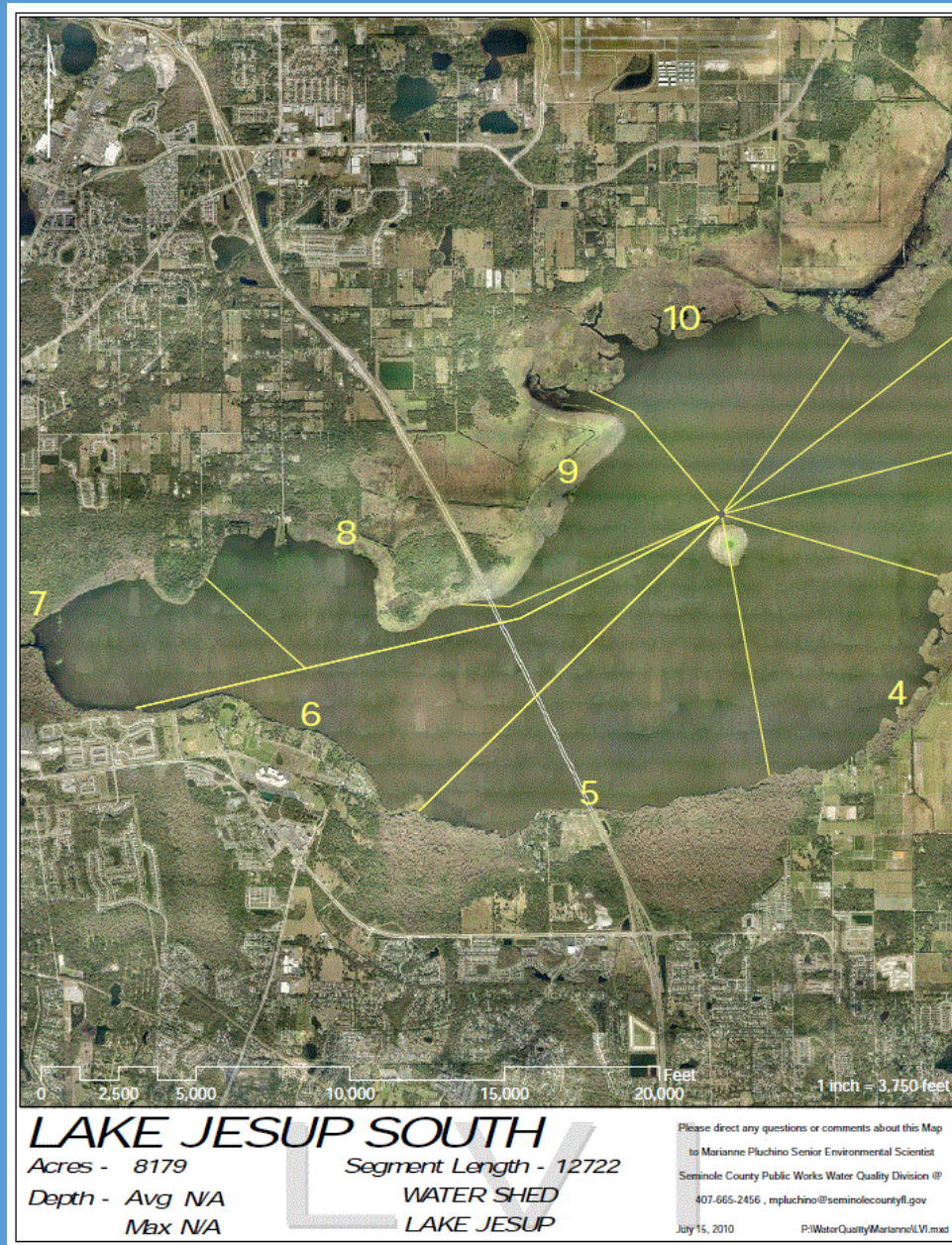
Lake Monroe Observations

- Hydrilla Seasonal fluctuations
- Seasonal influx of floating invasives
- Creeping primrose willow first observed 2013
- Bulrush plantings 2005
- Wayside Park shoreline restoration 2010



Lake Jesup Vegetation Sampling (LVI) (collected annually)

2007: 32 impaired
2008: 39 impaired
2009: 30 impaired
2010: 37 impaired
2011: 44 healthy
2012: 40 impaired
2013: 40 impaired
2014: 43 healthy



Lake Jesup Observations

- Dominant vegetation phragmites
- Minimal SAV (submersed aquatic vegetation)
- North shore restoration project begins 2009
- Overlook Park shoreline restoration 2010





LAKE JESUP COOPERATIVE EFFORTS: VEGETATION RESTORATION

Gloria Eby¹ and Ed Hayes²

¹Seminole County Lake Management Program, Sanford, FL

²Florida Fish and Wildlife Conservation Commission, Eustis, FL





FWC-AHRES/Sem Co Project



The Aquatic Habitat Restoration and Enhancement Sub-section (AHRES) is part of the Florida Fish and Wildlife Conservation Commission. Mission is to manage and restore freshwater aquatic habitats to benefit fish and wildlife.



FWC-AHRES/Sem Co Project

- Site 1





FWC-AHRES/Sem Co Project

- Site 1

Seminole County is working with the Florida Fish and Wildlife Conservation Commission (FWC) Aquatic Habitat Restoration Enhancement Section (AHRES) on a revegetation project on the north end of Lake Jesup. The project will be on sovereign submerged land, but it borders on Seminole County property. As part of the project, FWC Invasive Plant Management Section (IPM) has begun control of exotics in preparation for planting for April, 2010. Site location is approximately 14,500 linear feet of shoreline with an approximate planting zone of 100 ft considered as floodplain of Lake Jesup's shoreline (map attached).





FWC-AHRES/Sem Co Project

- Site 1





FWC-AHRES/Sem Co Project

- Site 1





FWC-AHRES/Sem Co Project

- Planting Starting July 2010
- 115,250 plants
- 21 species





Continued Shoreline Restoration Efforts- 2013



Invasive species



Removal



Revegetated



FWC Cages



Bulrush Team: 20



Planting Site:
10-15 per block

Fencing Team:
15

Data 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Google



Initial Plantings- June 2011

Purchased Eelgrass



Coco-mat Plantings- 2012



Nursery Tubs



Harvesting



Eelgrass planting events 2012-2015

- 428 volunteers
- 1712 volunteer hours
- ~ 113,750 plants



- Begin 400ac of phragmites removal
- Ariel herbicide application
- 2016-2017 begin replanting with native species



On-Going Efforts

- Continue Quarterly Monitoring of Macrophytes
- Continue/Expand Restoration Efforts with FWC-AHRES
- Continue SAV Mapping as BMAP is Implemented
- Successful, cost-effective lake restoration application
- Continue Bioassessments (LVI/Marcoinvertebrates)

QUESTIONS???

