

NSM Update - *Version 4.6*

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Discussion Items

- Naming Convention - ***Version 4.6***
- Changes (source code *and* input data)
- Output differences from Version 4.5

Source Code Changes

- Queue to proper place in rainfall binary file
- Linux compatibility

Input data - *Time series*

- Period of record expansion
- Recomputed rainfall
- Recomputed reference ET
- Updated boundary inflows

Period of Record Expansion

- Rainfall over model domain
 - Annual Average $_{65-95} = 51.97 \text{ inches/yr}$
 - Annual Average $_{96-00} = 52.96 \text{ inches/yr}$
- Reference ET (PET) over model domain
 - Annual Average $_{65-95} = 54.75 \text{ inches/yr}$
 - Annual Average $_{96-00} = 55.06 \text{ inches/yr}$
- Inflow into Istokpoga and Okeechobee
 - Annual Average $_{65-95} = 1,466 \text{ kacft/yr}$
 - Annual Average $_{96-00} = 1,789 \text{ kacft/yr}$

Recomputed Rainfall

- Based on TIN-10 methodology
- Global Differences, 1965 - 1995
 - Annual Average $_{\text{Thiessen}} = 52.29 \text{ inches/yr}$
 - Annual Average $_{\text{TIN}} = 51.97 \text{ inches/yr}$

Recomputed Reference ET

- Based on new solar radiation estimates
- Global Differences, 1965-1995
 - Average Annual $_{\text{nsm4.5}} = 55.20 \text{ inches/yr}$
 - Average Annual $_{\text{nsm4.6}} = 54.76 \text{ inches/yr}$

Updated Boundary Inflows

- Lake Okeechobee Inflow (1965-1995)
 - Kissimmee River: 958 *kacft* (+ <1 %)
 - Fisheating Creek: 165 *kacft* (-2.75 %)
 - Taylor Creek: 39 *kacft* (+ <1%)
 - Nubbin Slough: 31 *kacft* (+ <1%)
 - S154 basin: 20 *kacft* (+ <1%)

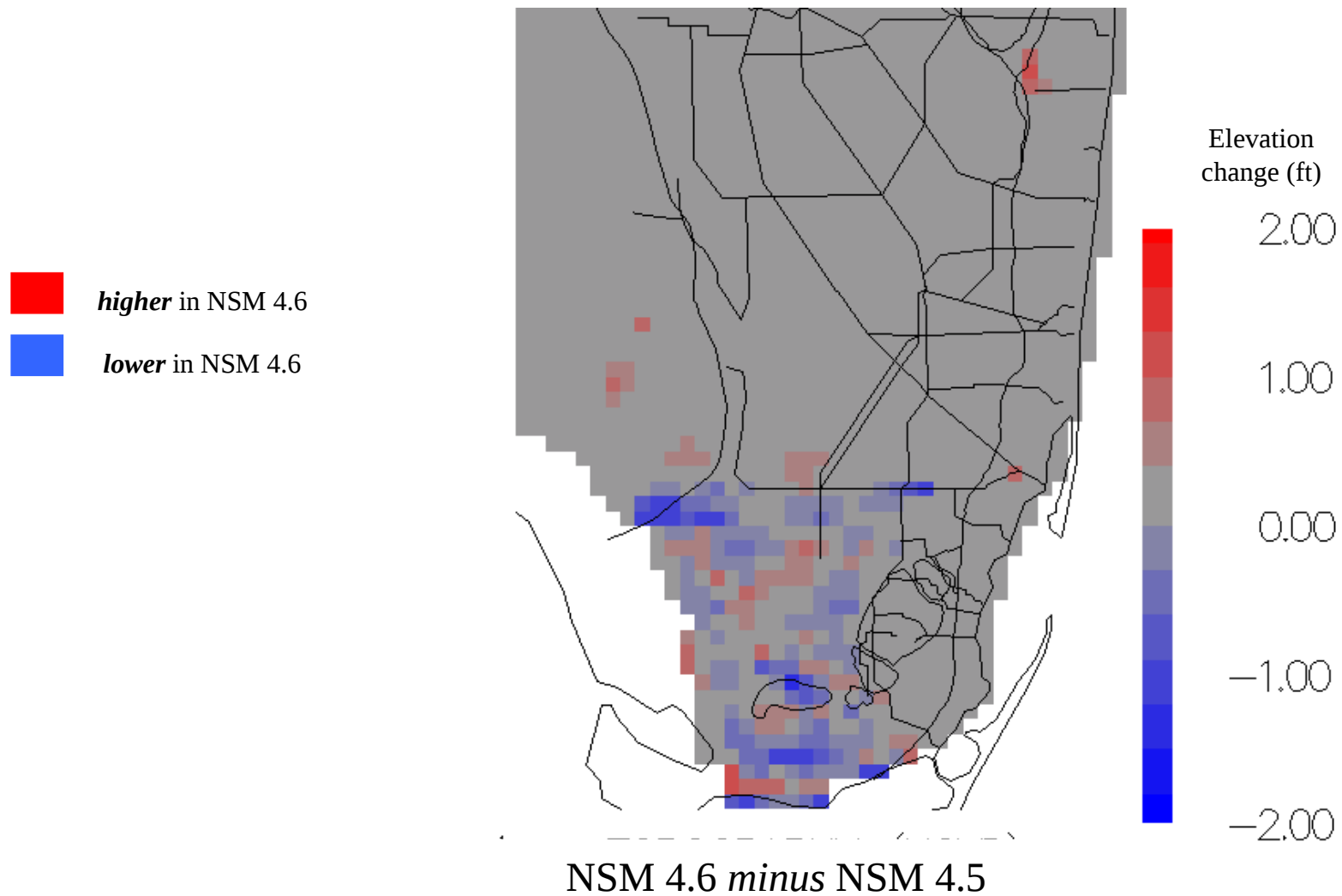
Updated Boundary Inflows

- Lake Istokpoga Inflow (1965-1995)
 - Arbuckle Creek: 168 *kacft* (-7 %)
 - Josephine Creek: 38 *kacft* (-5 %)
 - Local inflow: 27 *kacft* (-6 %)

Static Input Data

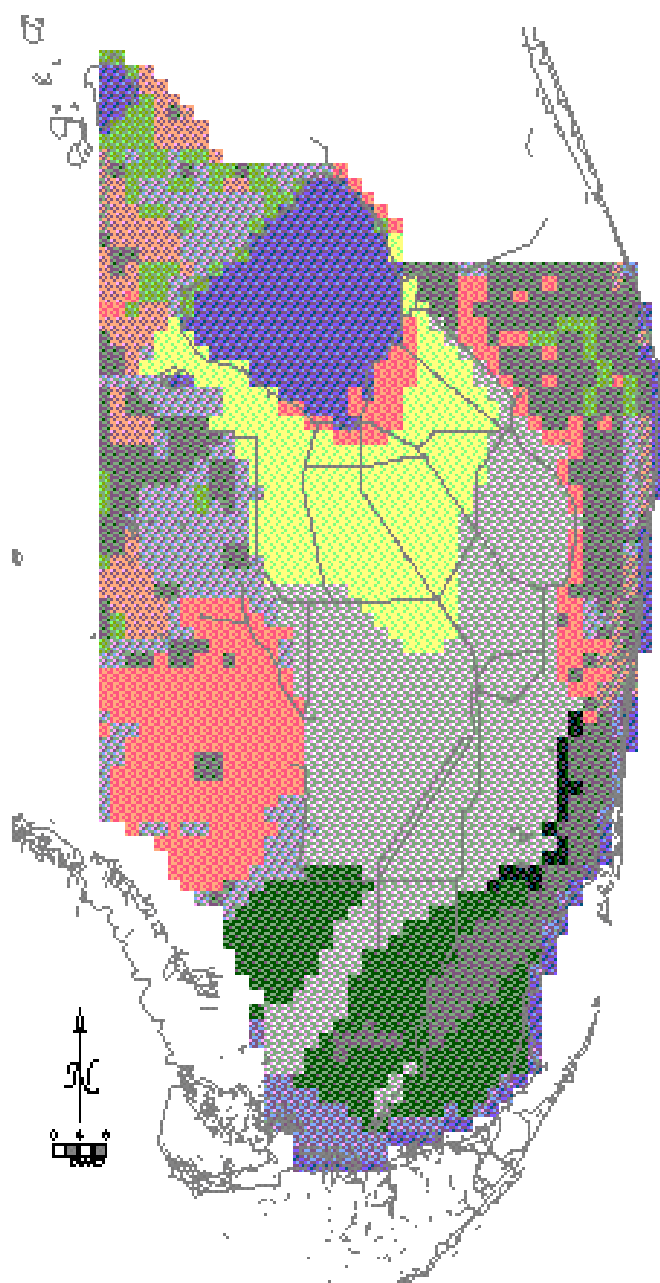
- Topography
 - Consistent with SFWMM V5.0 *south* of Tamiami Trail
 - greater than or equal to SFWMM V5.0 *north* of Tamiami Trail

Topographic Differences



Static Input Data

- Landuse/Landscape Specifications
 - Derived from calibrated SFWMM V5.0
 - ET specifications
 - monthly “crop” coefficients
 - open water ponding depths
 - shallow and deep root zone depth
 - Overland flow specifications
 - Mannings roughness coefficient
 - detention depth



Landscape Type

	Forest Upland
	Grassland
	Shrub
	Forest Wetland
	Sawgrass plain
	Fresh Marsh
	Marl Marsh
	Edge Marsh
	Ridge & Slough
	Wet Prairie
	Mangrove
	Ocean, lakes

ET Specifications

- Monthly “Crop” Coefficients
 - marsh and wet prairie - increased up to 7%
 - forested uplands and wetlands- increased up to 5%
 - sawgrass and ridge & slough - little change $\pm 1\%$
 - mangrove and shrub were unchanged
 - marl prairie - decreased up to 7%

ET Specifications

- Open water ponding depths
 - increased 4-5 ft in forested areas
 - increased 1 ft in ridge and slough
 - increased 0.5 ft in wet prairie
- Root depth
 - shallow root zone decreased 0.25 ft in forested upland
 - deep root zone increased 0.5 ft in sawgrass, decreased 0.5 ft in fresh marshes

Overland Flow Specifications

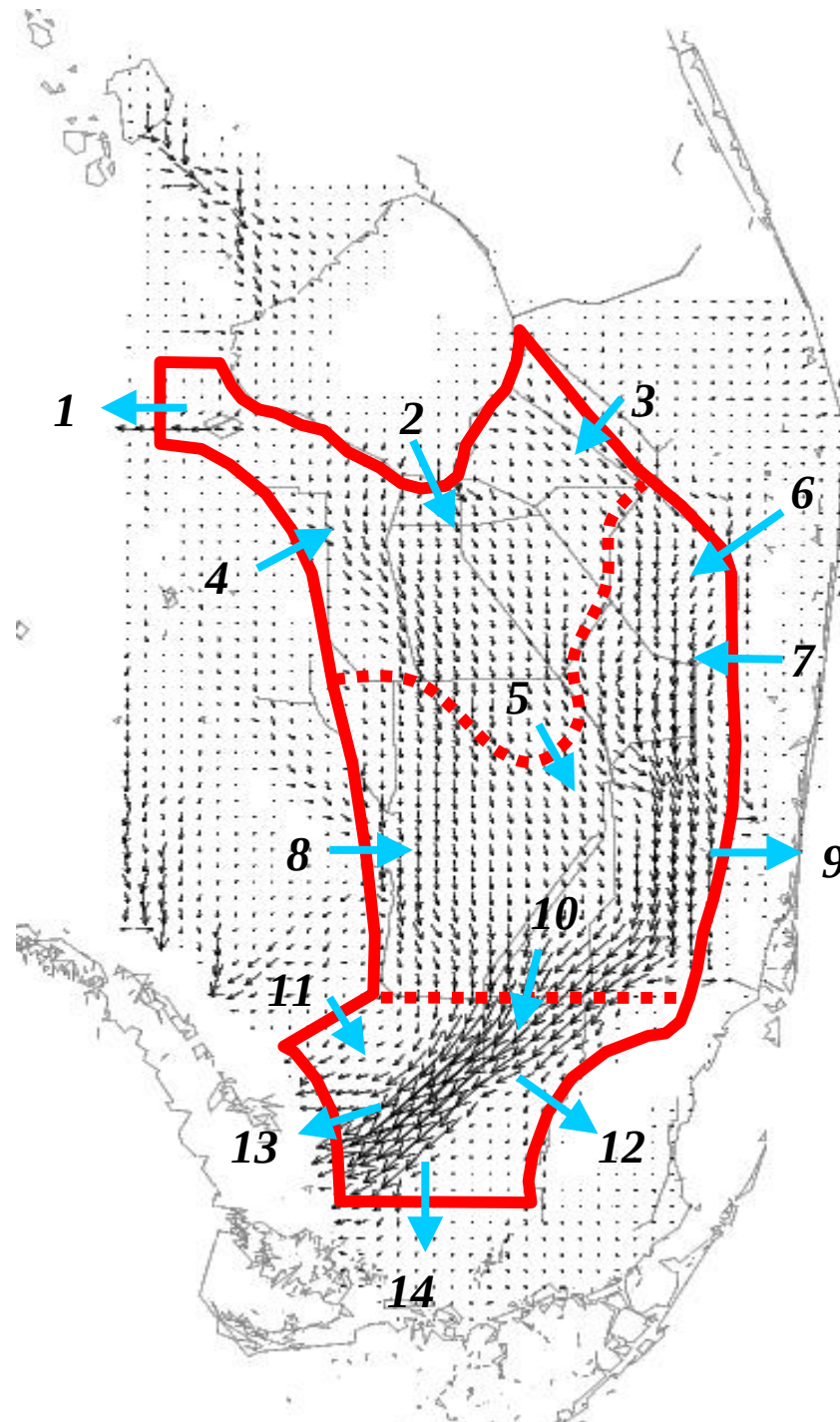
- Manning's Roughness
 - generally higher, i.e., increased resistance
 - ridge & slough: +0.06
 - sawgrass: +0.09
 - forested wetland: +0.095
 - fresh marsh: +0.1
- Detention depth
 - forested uplands: increased by 0.005
 - forested wetlands: decreased by 0.005
 - sawgrass: decreased by 0.01

Results??

- Flow line differences between 4.5 and 4.6
 - relative to 1965 - 1995
 - relative to 1965 - 2000

<u>Surface Flow Line</u>¹	<u>Flow</u> (kacft/yr)
1 Caloosahatchee	130
2 L. Okeechobee	858
3 E. Flatlands	137
4 W. Flatlands	123
5 Central Everglades	1163
6 E. Flatlands	93
7 Mid Atlantic Strip	37
8 Big Cypress	116
9 Lower-Atlantic	349
10 Tamiami Trail	1674
11 Big Cypress	65
12 Miami Rock Ridge	19
13 Southwest Coast	1396
14 South Coast	445

NSM 4.5
1965-1995

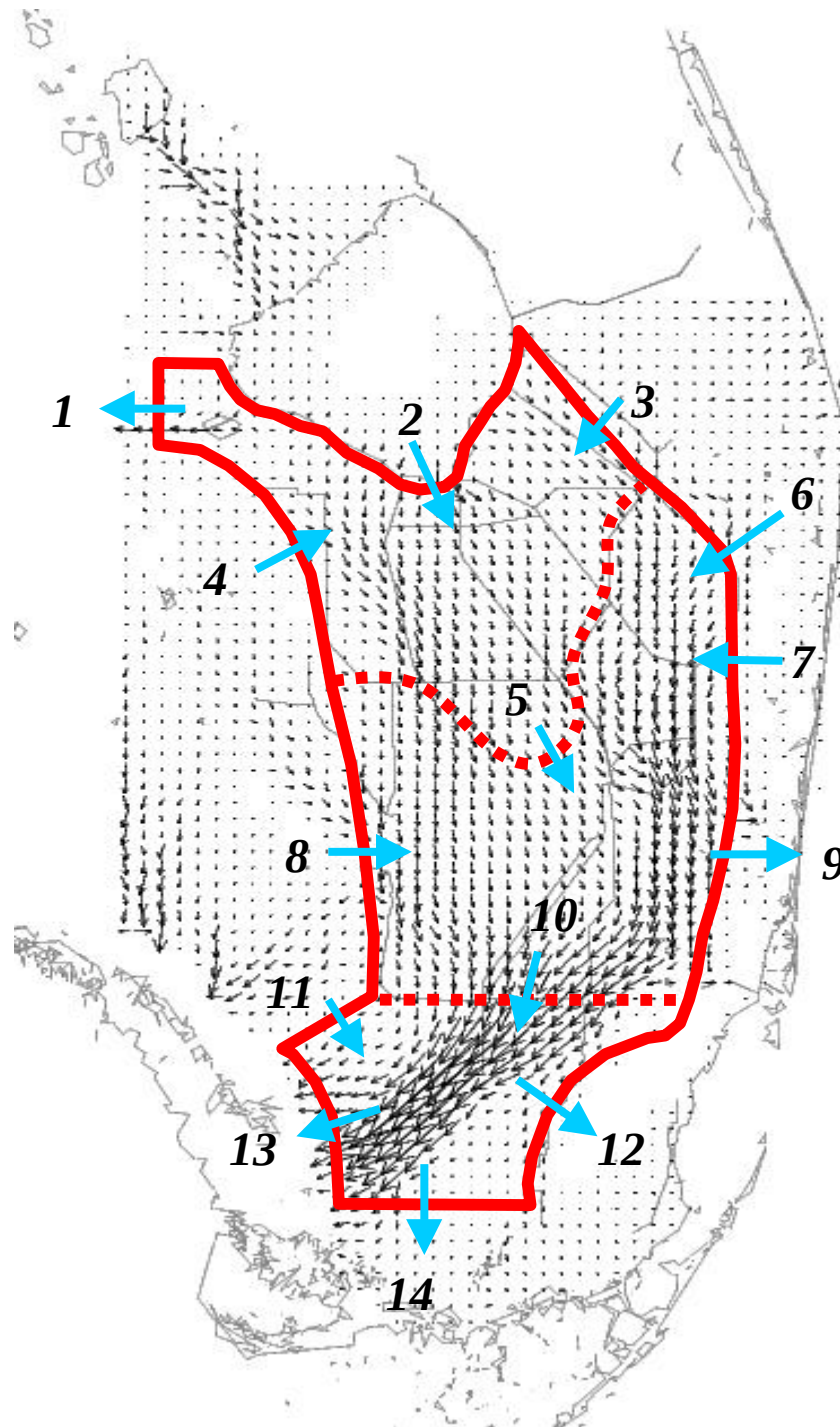


¹ Flow line includes channel flow

<u>Surface Flow Line¹</u>	<u>Flow kacft/yr</u>	<u>Chg kacft/yr</u>
1 Caloosahatchee	137	7
2 L. Okeechobee	907	49
3 E. Flatlands	117	(20)
4 W. Flatlands	93	(30)
5 Central Everglades	1071	(92)
6 E. Flatlands	80	(13)
7 Mid Atlantic Strip	33	(4)
8 Big Cypress	135	19
9 Lower-Atlantic	346	(4)
10 Tamiami Trail	1679	5
11 Big Cypress	92	27
12 Miami Rock Ridge	37	18
13 Southwest Coast	1424	28
14 South Coast	470	25

***NSM 4.5 TO NSM 4.6
Comparison
1965-1995 only***

¹ Flow line includes channel flow



<u>Surface Flow Line¹</u>	<u>Flow kacft/yr</u>	<u>Chg kacft/yr</u>
1 Caloosahatchee	147	17
2 L. Okeechobee	964	106
3 E. Flatlands	113	(23)
4 W. Flatlands	96	(28)
5 Central Everglades	1021	(43)
6 E. Flatlands	82	(11)
7 Mid Atlantic Strip	32	(5)
8 Big Cypress	133	17
9 Lower Atlantic Strip	366	17
10 Tamiami Trail	1794	120
11 Big Cypress	98	32
12 Miami Rock Ridge	41	22
13 Southwest Coast	1521	125
14 South Coast	497	52

***NSM 4.5 TO NSM 4.6
Comparison
periods of record***

¹ Flow line includes channel flow

