

MODBRANCH PDM Results

Alternatives 5 and 5R
compared with
Alt7R (“Existing Condition”)
and
Plan 6D

25 January 2006

Alternative 5 REVISIONS as they apply to MODBRANCH PDM model.

S-356 pump station:

Additional capacity of 450 cfs will be moved south to discharge directly to NESRS, instead of L-29 in alt5.
Triggers: 200 cfs total at 6.0/5.8 (alt5 at 6.2/6.0); 450 cfs total at 6.1/5.9 (alt5 at 6.4/6.2)

Mandatory 'on' criteria for existing 500 cfs pump station lowered from 6.1 to 5.9 (note: unable to be simulated by SFWMM; would potentially provide additional flood protection benefits)

S-335:

Partial gate opening of 250 cfs lowered from 7.2/7.0 in alt5 to 7.1/6.9; tailwater constraint unchanged at S-335 TW > 6.3

Full gate opening raised from 7.4/7.2 in alt5 to 7.6/7.4; tailwater constraint raised from S-335 TW > 6.0 to S-335 TW > 6.2

G-211: partial gate opening of 125 cfs changed to dry season only, avoiding inter-basin transfer during wet season

S-173 and S-331:

triggers lowered by 0.2 feet to improve high-water conditions in upper 10% of stage duration curve:

S-173 lowered from 5.3/5.1 in alt5 to 5.1/4.9

S-331 lowered from 5.5/5.3 in alt5 to 5.3/5.1

S-178: changed to alt4 operational levels per PDT guidance (4.6/4.4)

S-18C: triggers lowered to alt3 and alt4 levels given alt5 potential flooding concerns for Florida City area
- triggers lowered from 3.2/2.8 annual in alt5 to 2.6/2.3 in wet season and 3.0/2.6 in dry season

Alternative 5 REVISIONS as they apply to MODBRANCH PDM model (continued).

C-111 detention area pumps: alt5 trigger levels unchanged, but lowest pump trigger changed from 125 cfs to 75 cfs total at both S-332B and S-332C (next higher trigger level picks up the deferred pump capacity); mandatory on criteria modified to remove reservoir maximum depth constraint (3.0 feet in alt5) when S-176 is fully open discharging south

- alt5r operations:

wet season – 4.5/4.3 (75cfs); 4.6/4.4 (250cfs); 4.7/4.5 (375cfs); 4.8/4.6 (500cfs)

- alt5r operations:

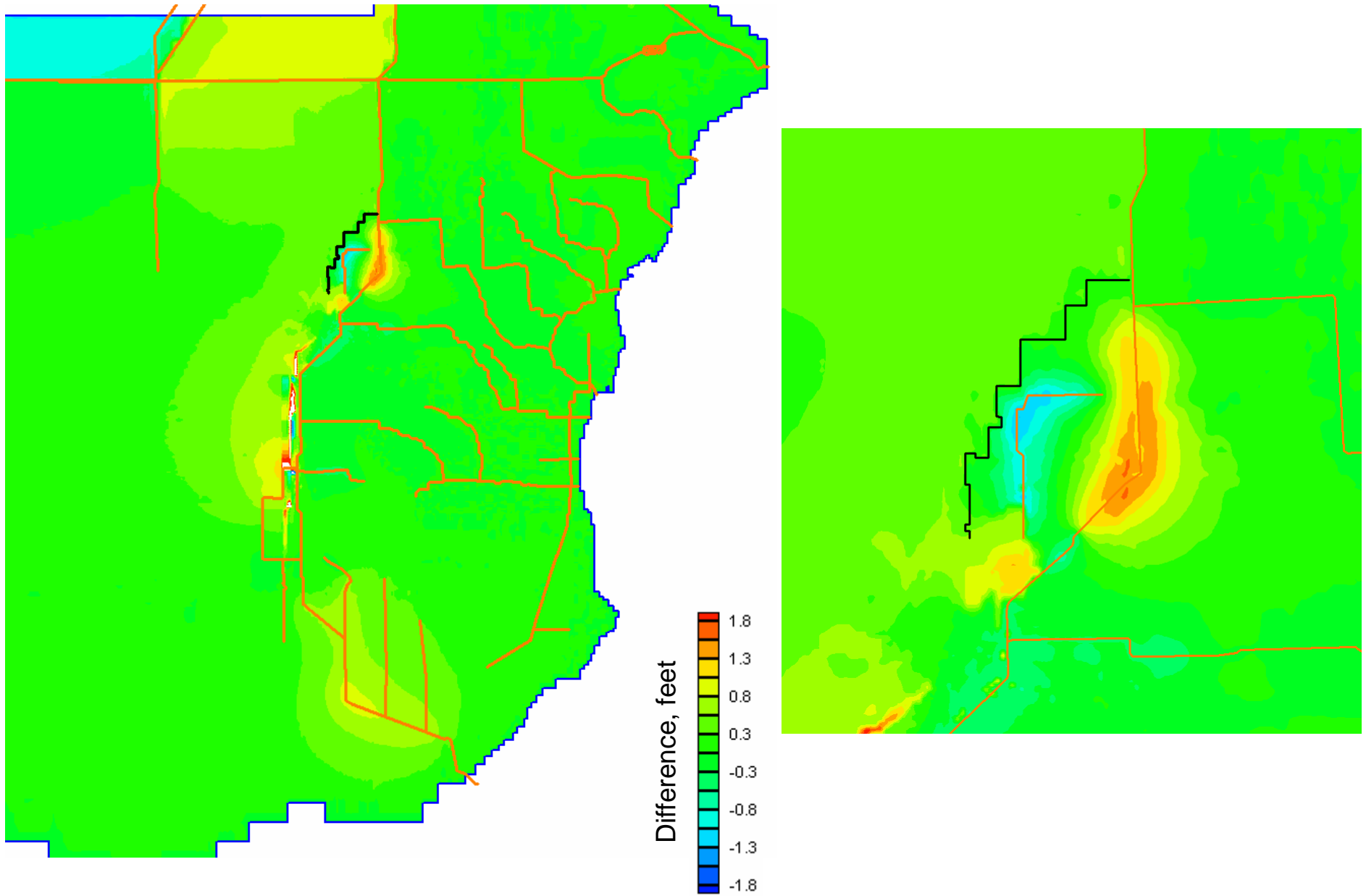
dry season -- 4.6/4.4 (75cfs); 4.7/4.5 (250cfs); 4.8/4.6 (375cfs); 4.9/4.7 (500cfs)

-mandatory on operations: S-176 HW at 5.0, 2 pumps at S332B and S332C allowed to maintain reservoir depths up to 3.0 feet; S-176 gate opening occurs when S-176 HW > 5.1 (unchanged from alt5); when S-176 HW > 5.3, reservoir depth constraint of 3.0 feet is removed and 375 cfs discharge is allowed at both S-332B and S-332C; as in alt5, all pumps are switched on when S-176 HW > 5.5, but reservoir depth constraint is removed under alt5r; potential overflow to west form culverts and emergency spillways unchanged from alt5, occurring if depths exceed 3.5 and 4.0 feet, respectively (note mandatory on operations are not simulated by SFWMM; MODBRANCH only).

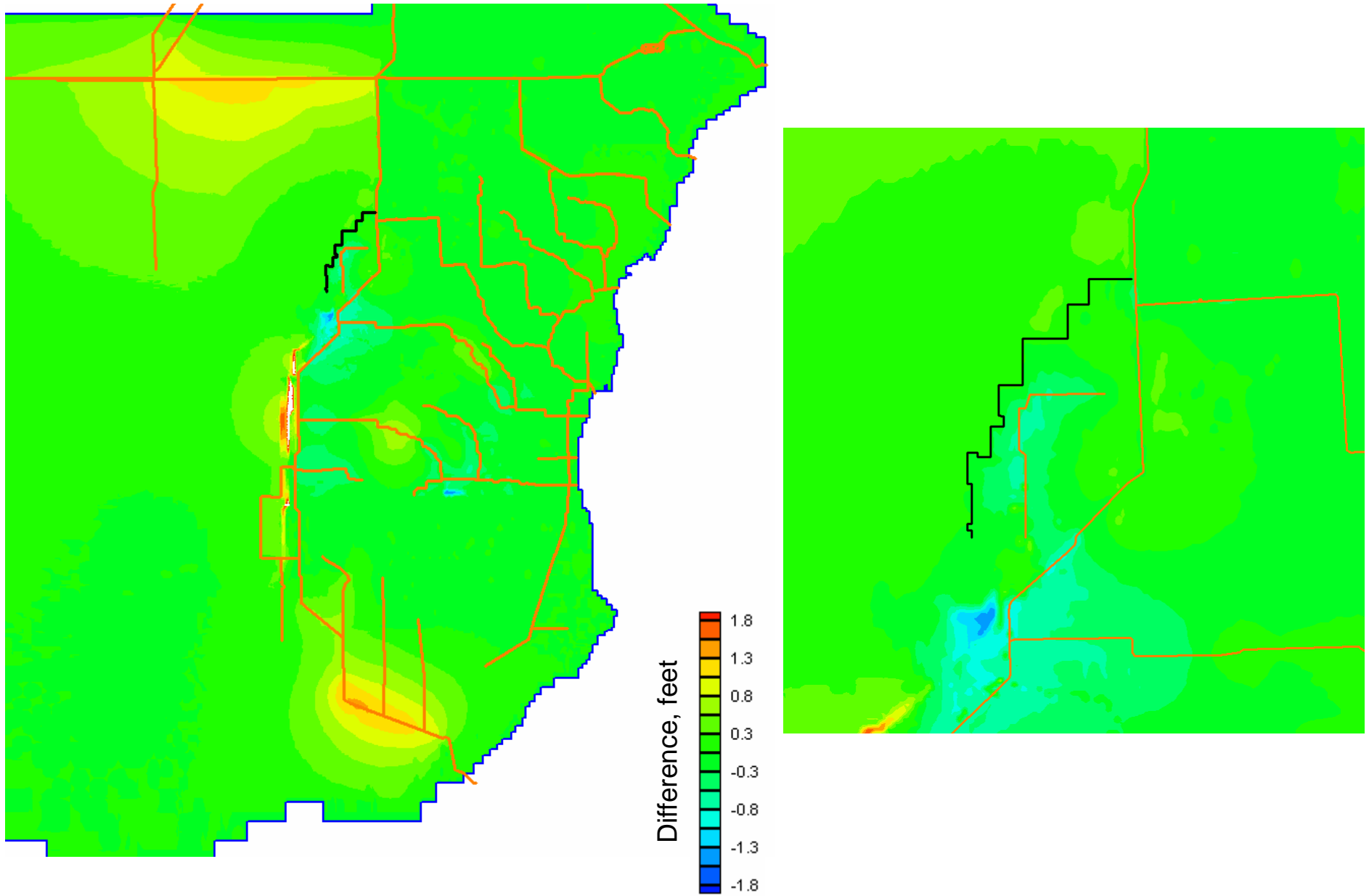
L-29 constraints for discharges from S-333, S-355, and S-356 removed from alt5 (peak stage in L-29 remains close to 9.5-9.6, as under alt5)

Peak Stage Differences for 1995 Wet Year

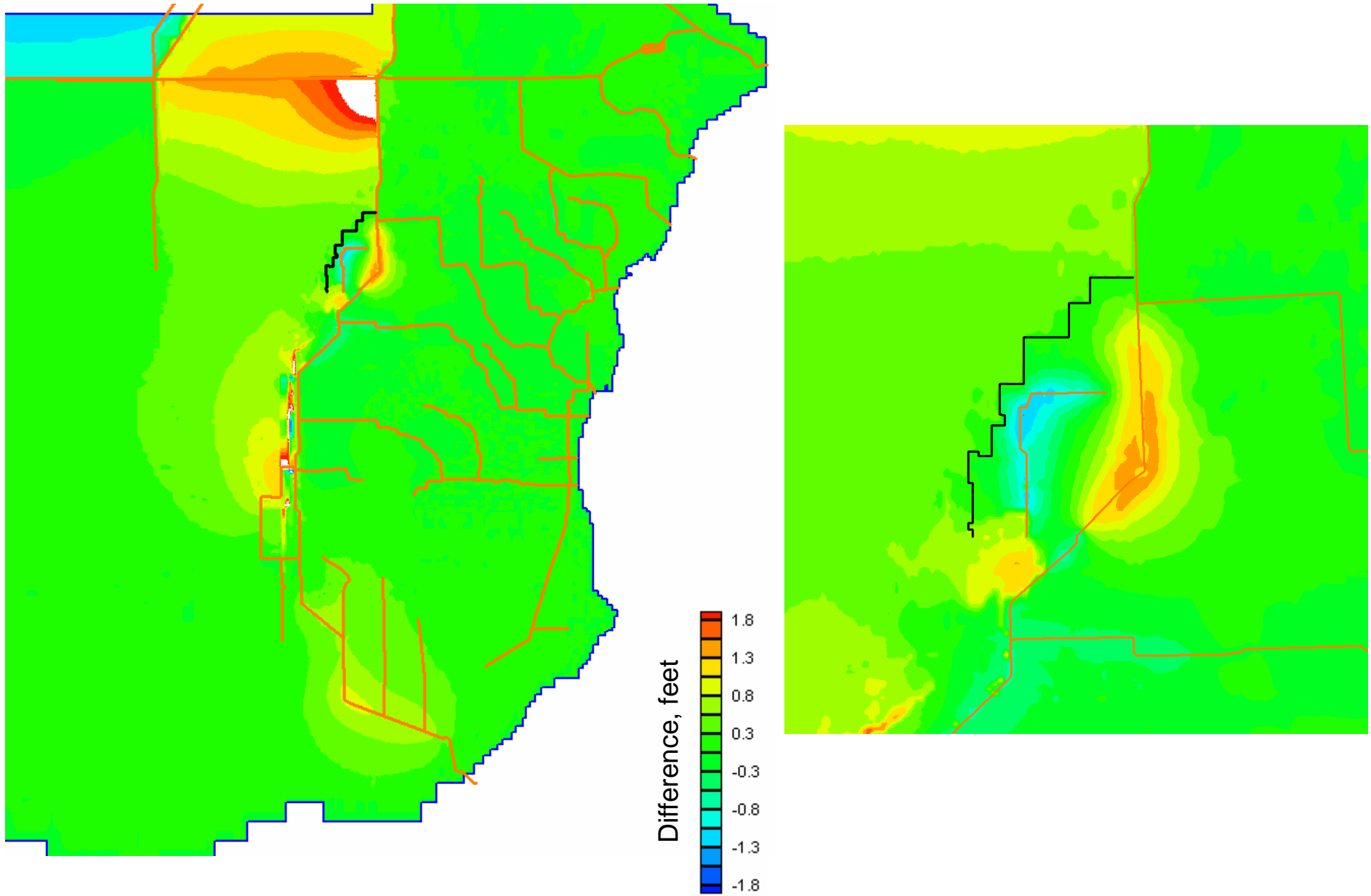
Peak Stage (1995) differences (Alt5 – Alt7R)



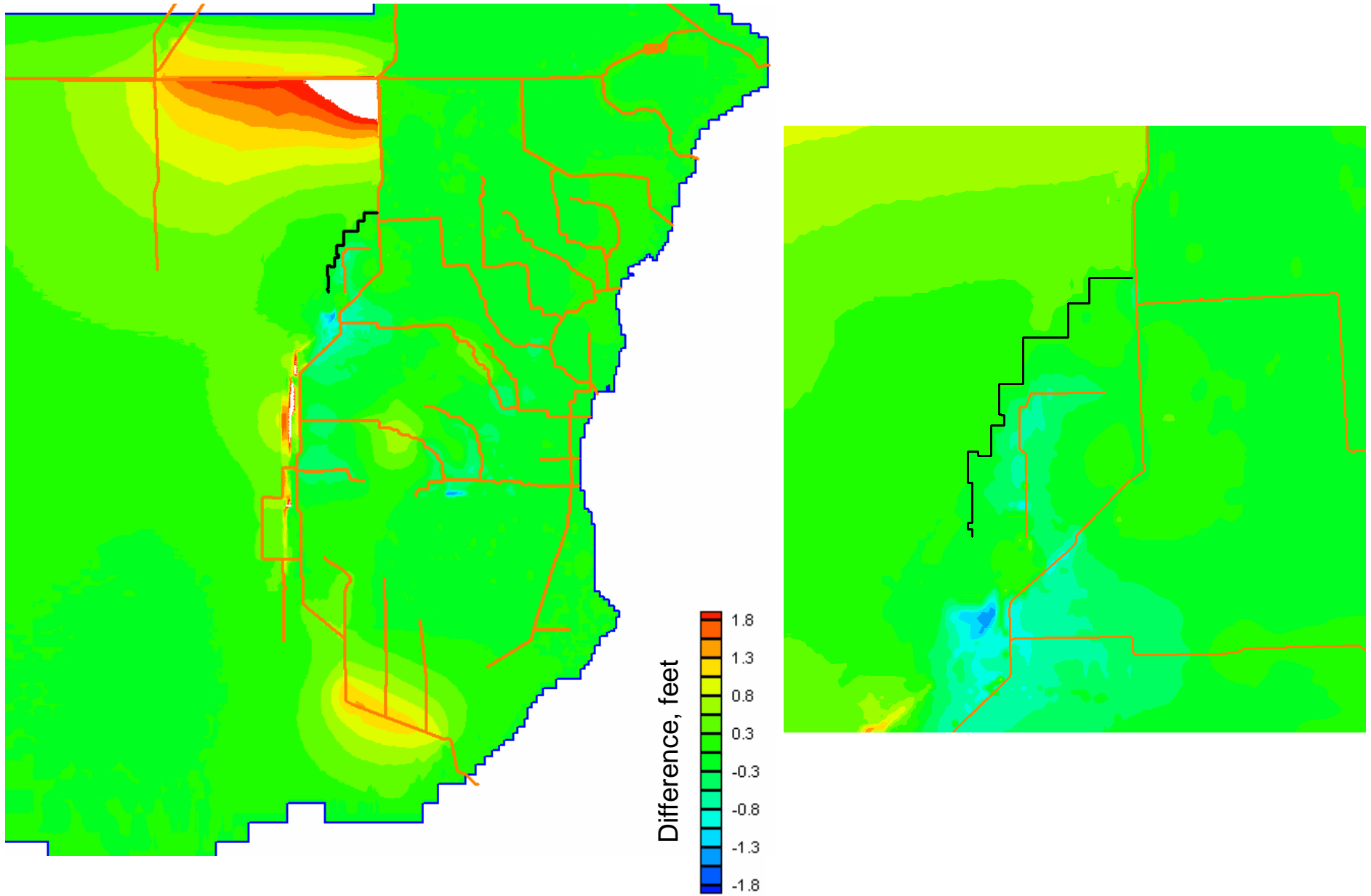
Peak Stage (1995) differences (Alt5 – Plan 6D)



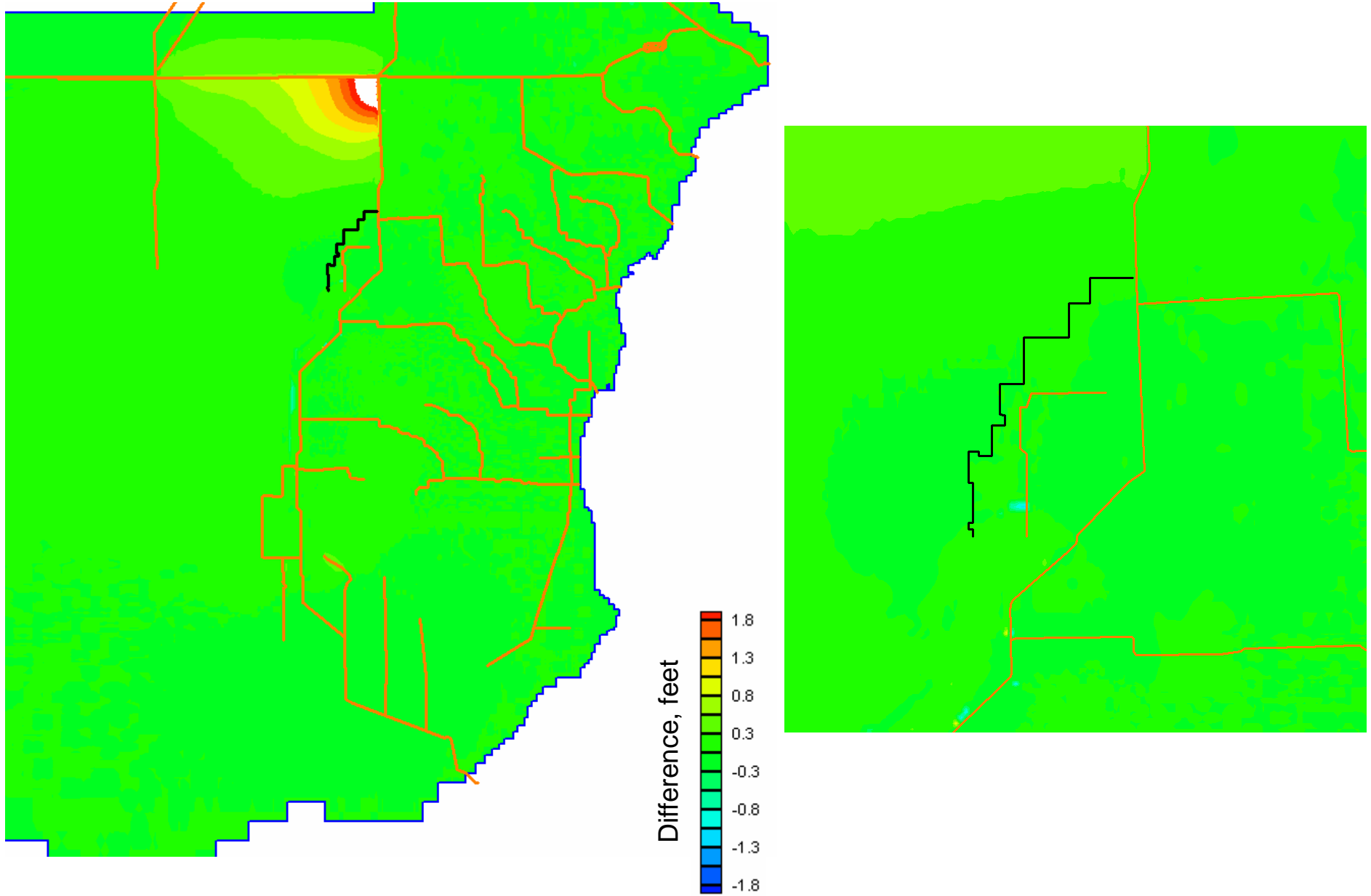
Peak Stage (1995) differences (Alt5R – Alt7R)



Peak Stage (1995) differences (Alt5R – Plan 6D)

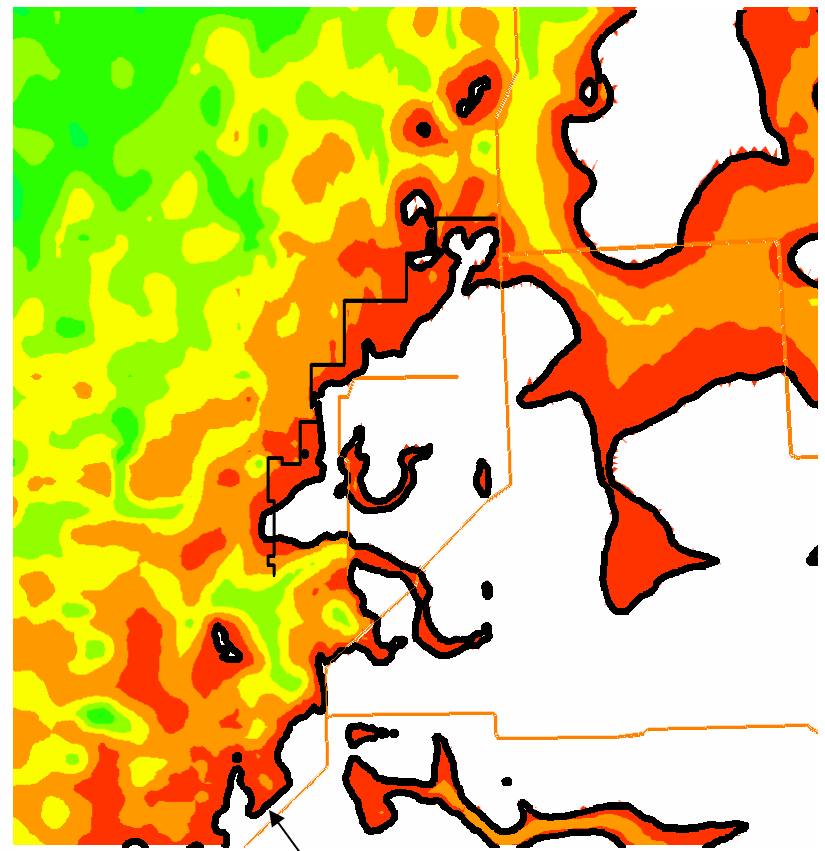
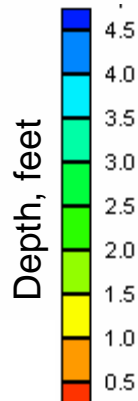
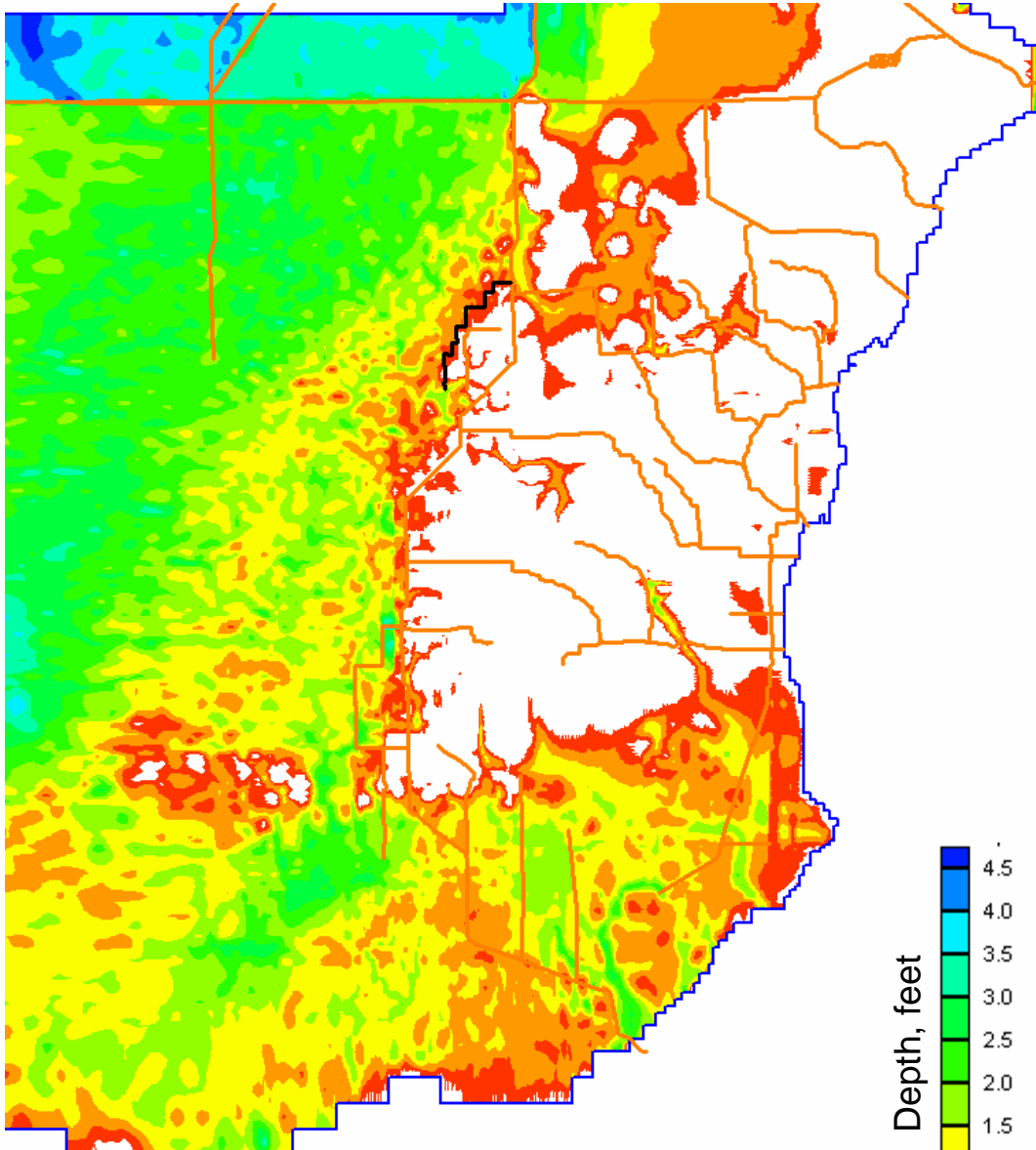


Peak Stage (1995) differences (Alt5R – Alt5)



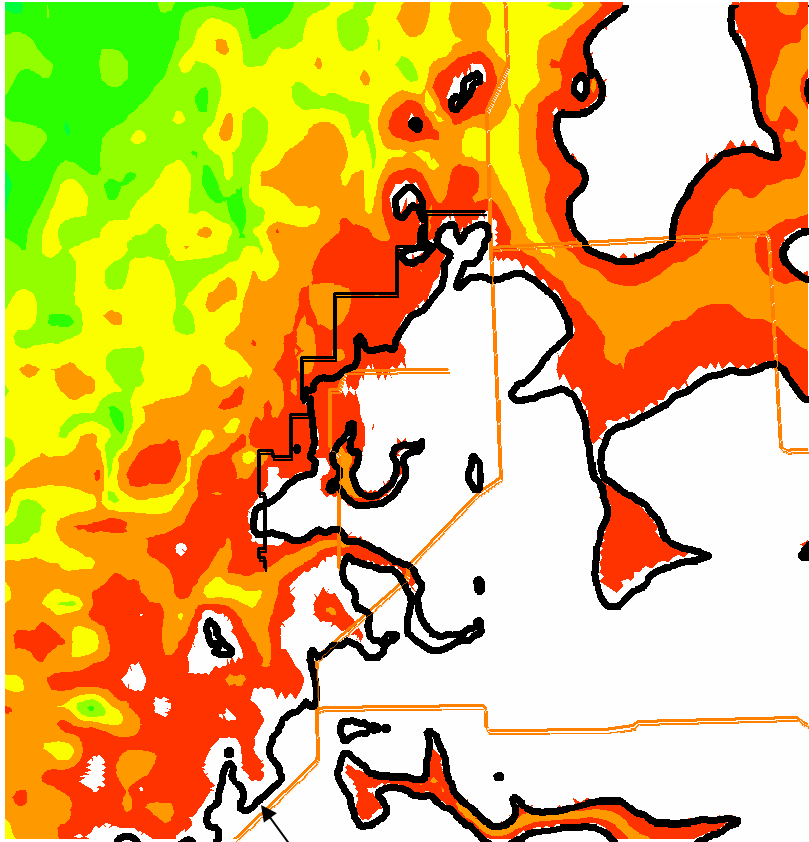
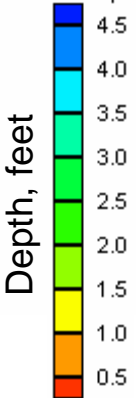
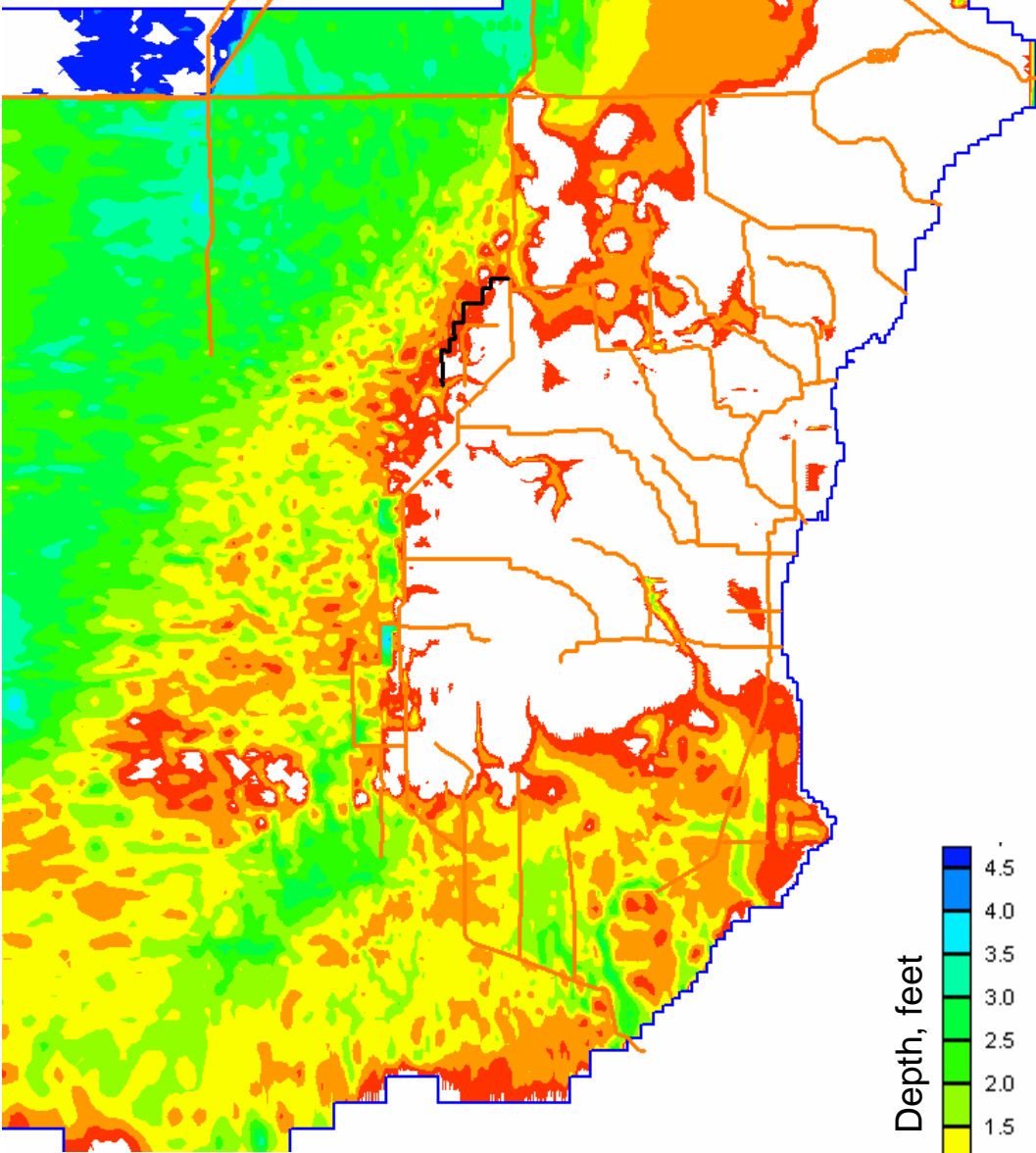
Peak Stage Ponding Depths for 1995 Wet Year

Peak Stage Ponding Depths (1995) Plan 6D



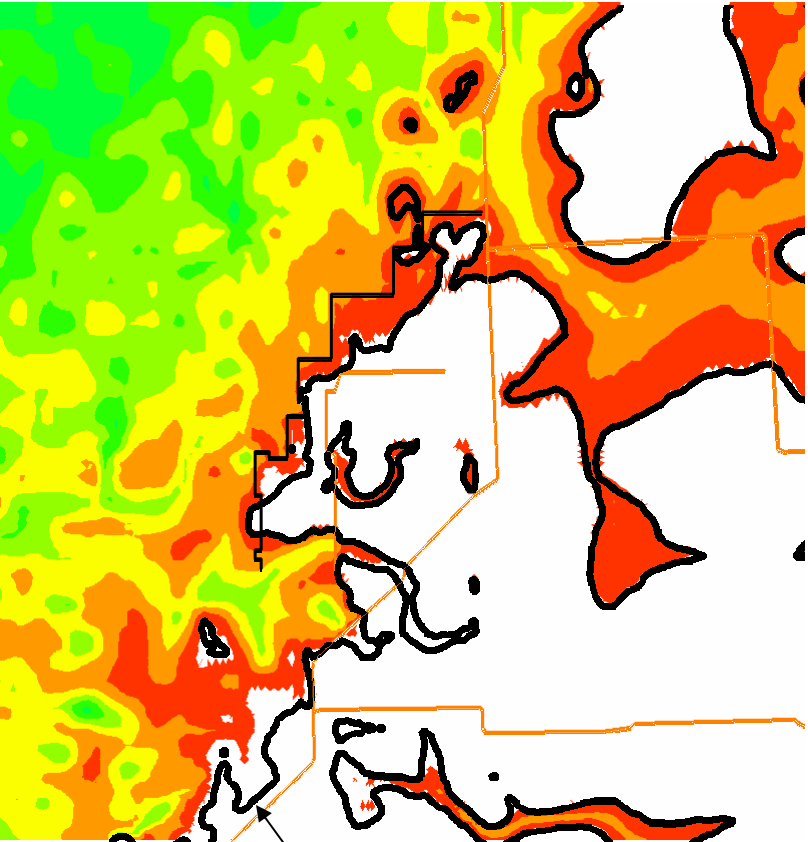
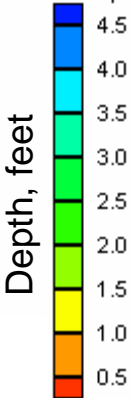
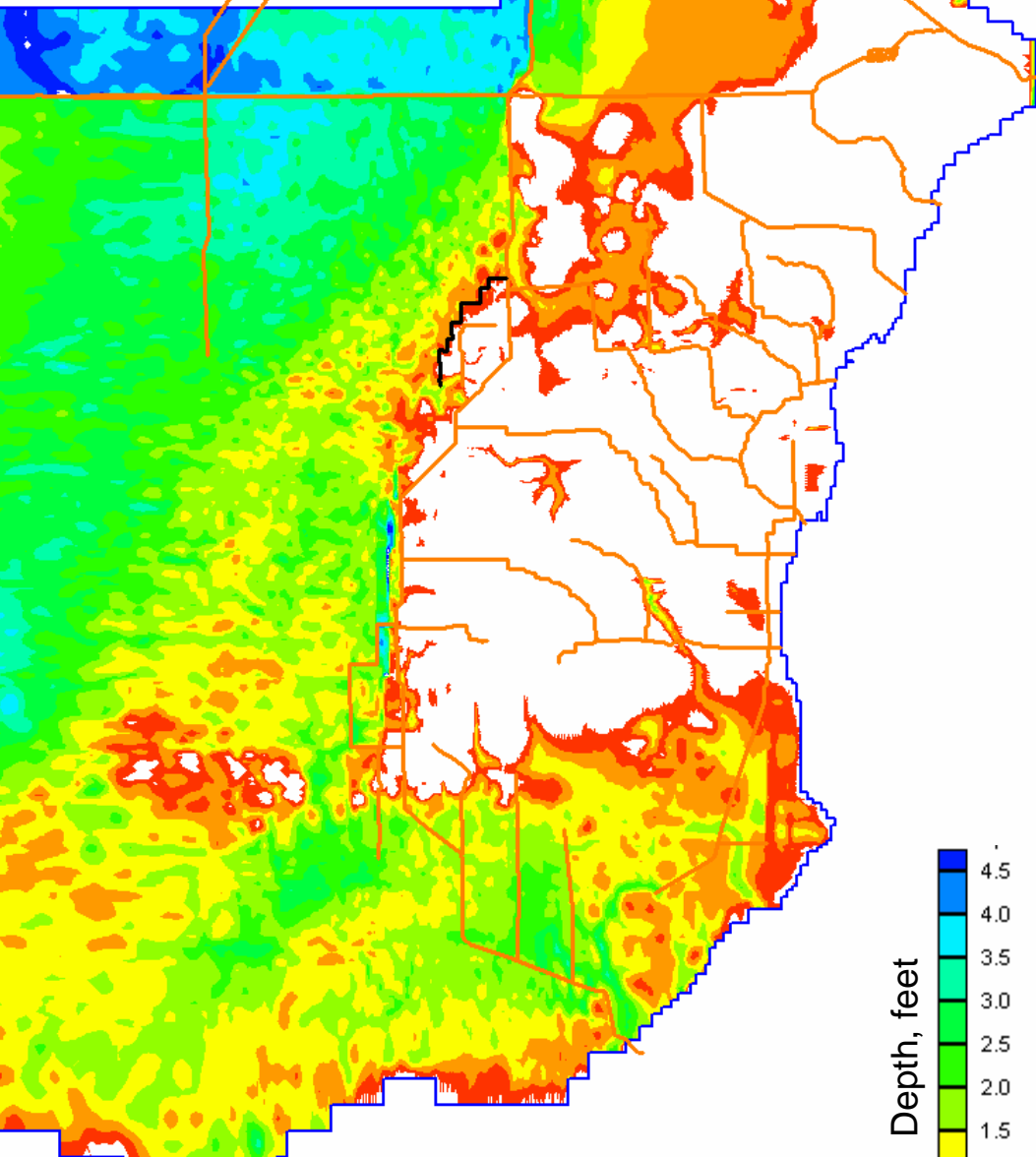
Plan 6D Ponding

Peak Stage Ponding Depths (1995) Alt7R



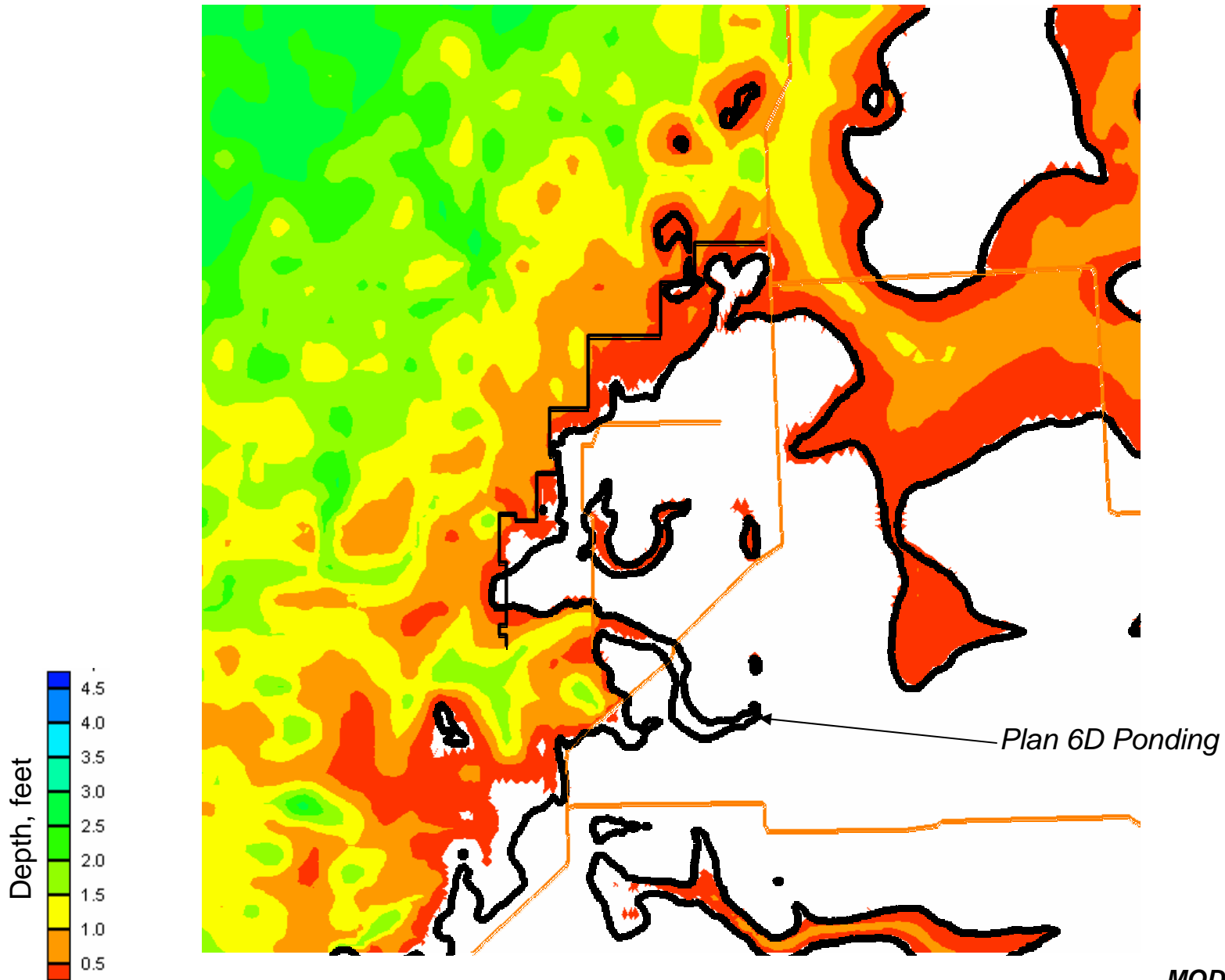
Plan 6D Ponding

Peak Stage Ponding Depths (1995) Alt5

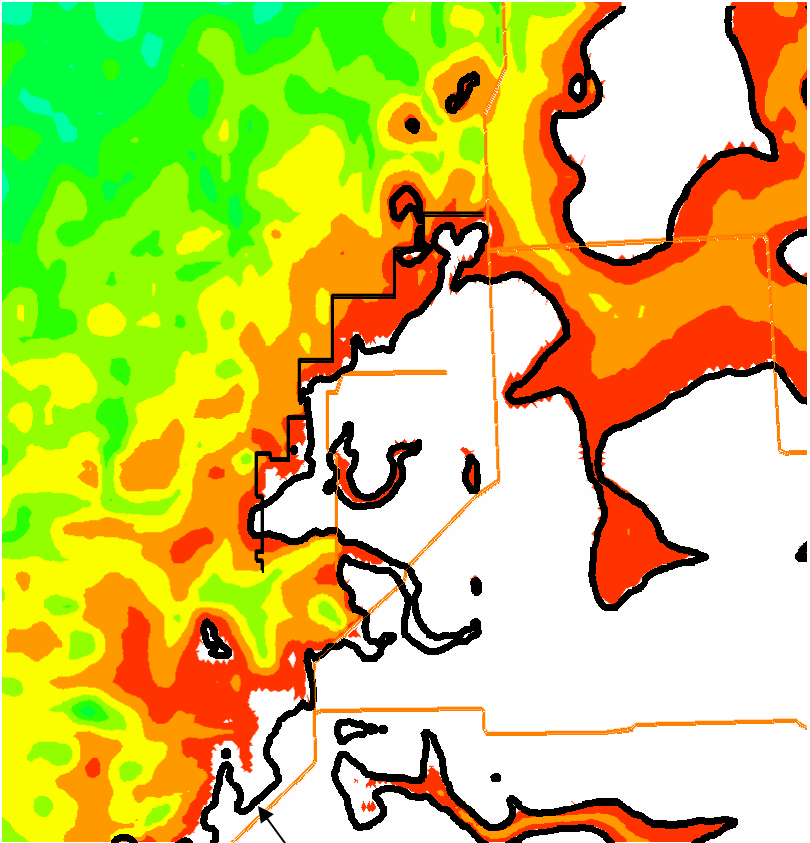
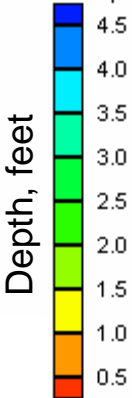
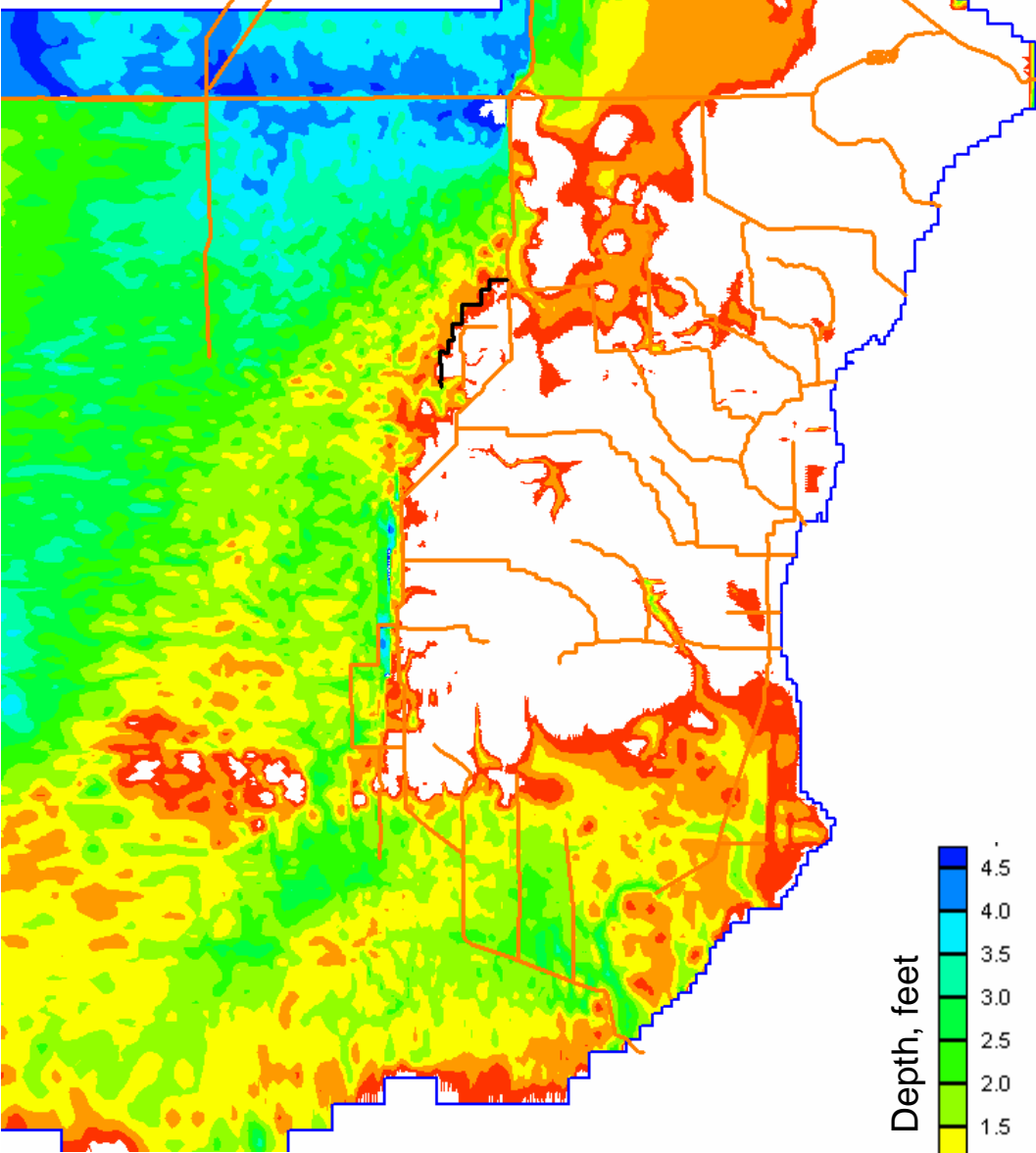


Plan 6D Ponding

8.5 SMA Peak Stage Ponding Depths (1995) Alt5

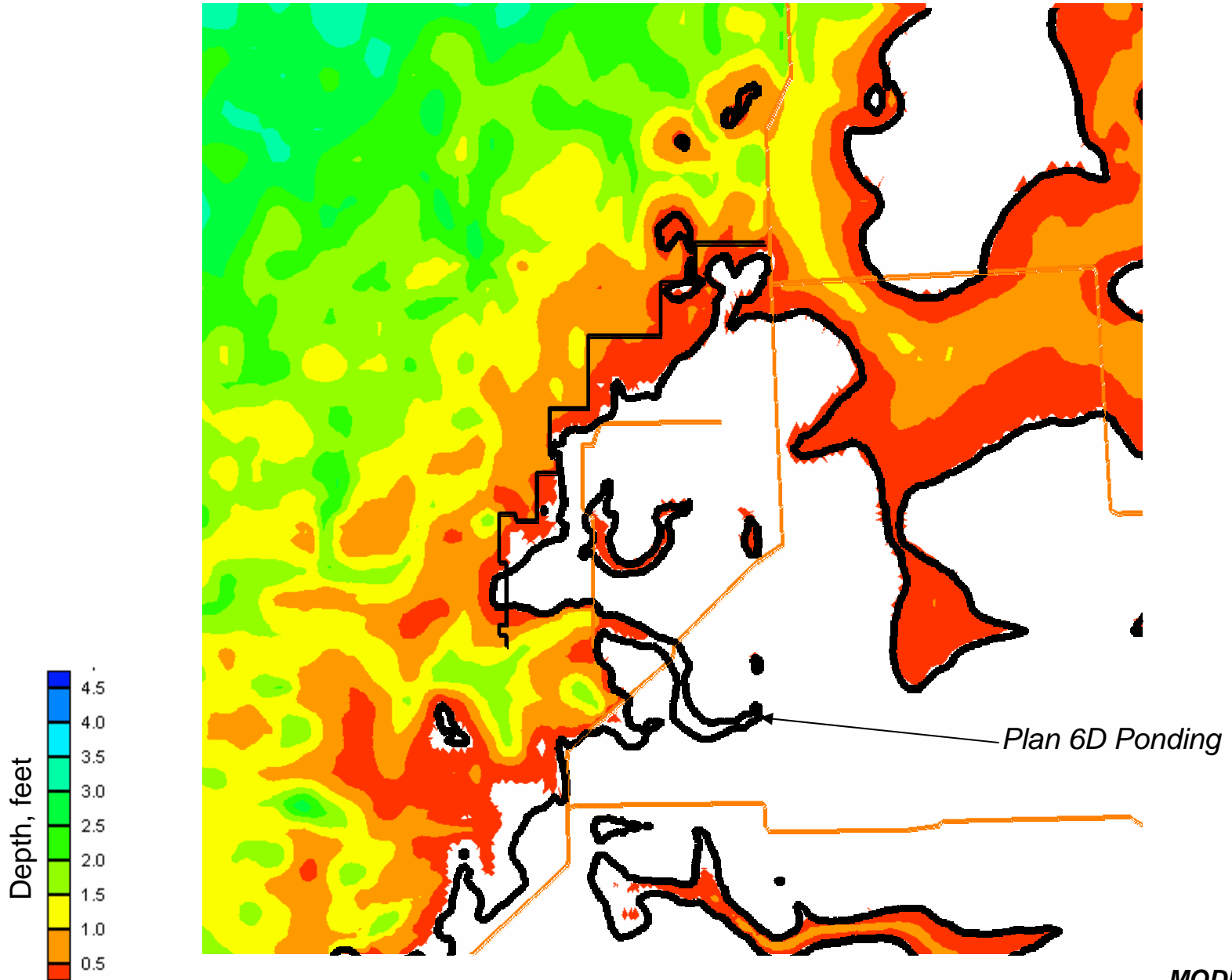


Peak Stage Ponding Depths (1995) Alt5R



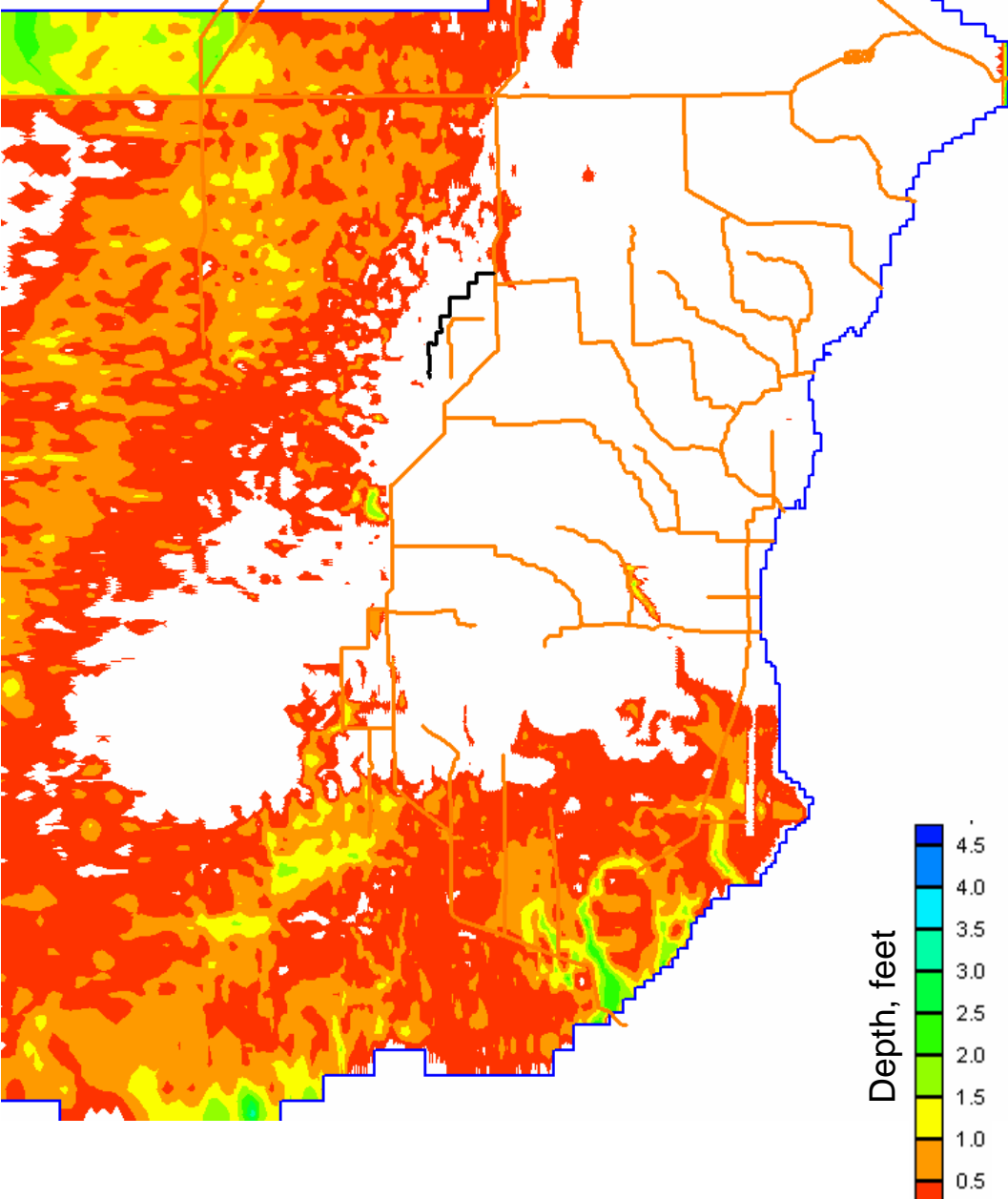
Plan 6D Ponding

8.5 SMA Peak Stage Ponding Depths (1995) Alt5R

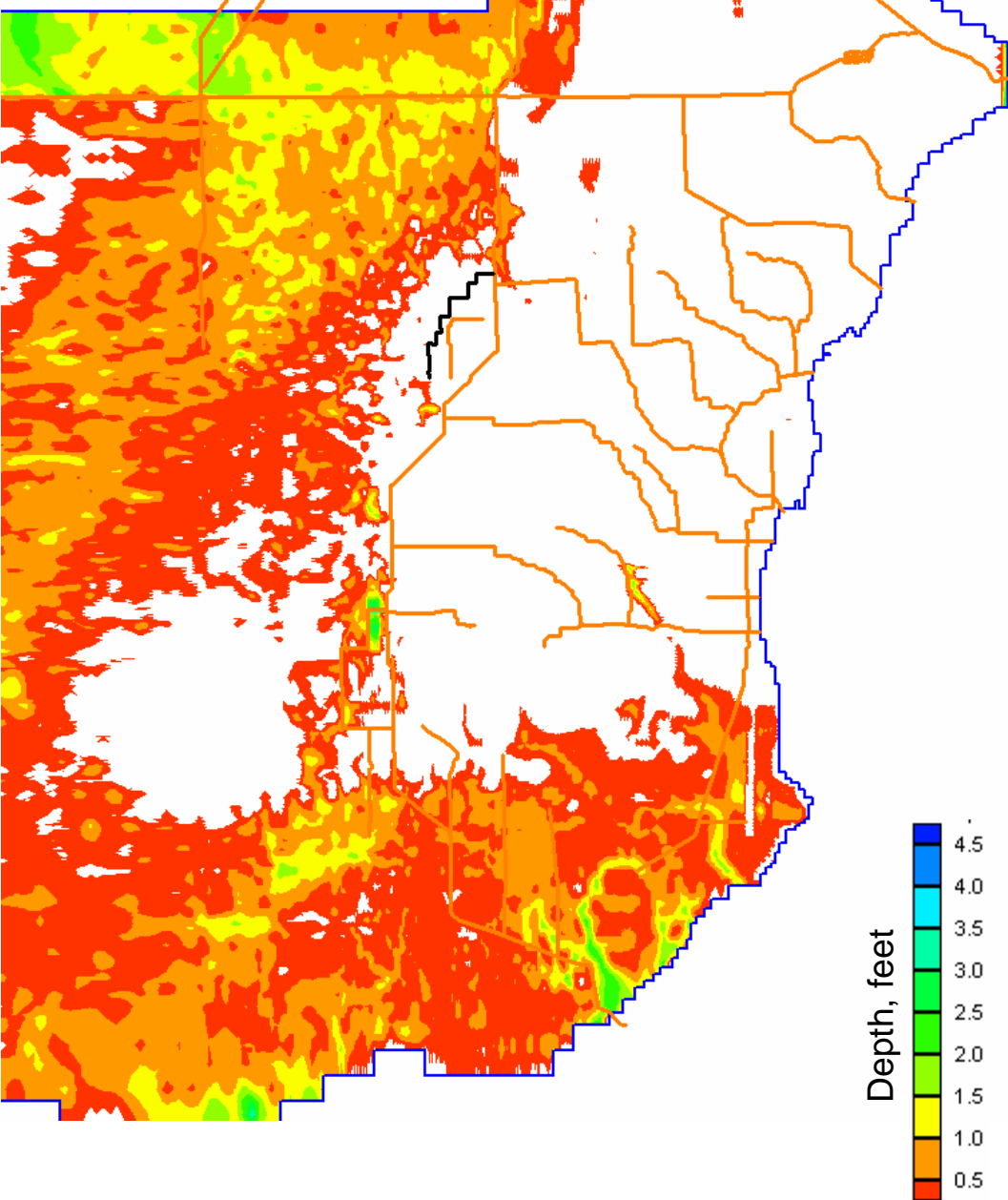


Peak Stage Ponding Depths for 1989 Dry Year

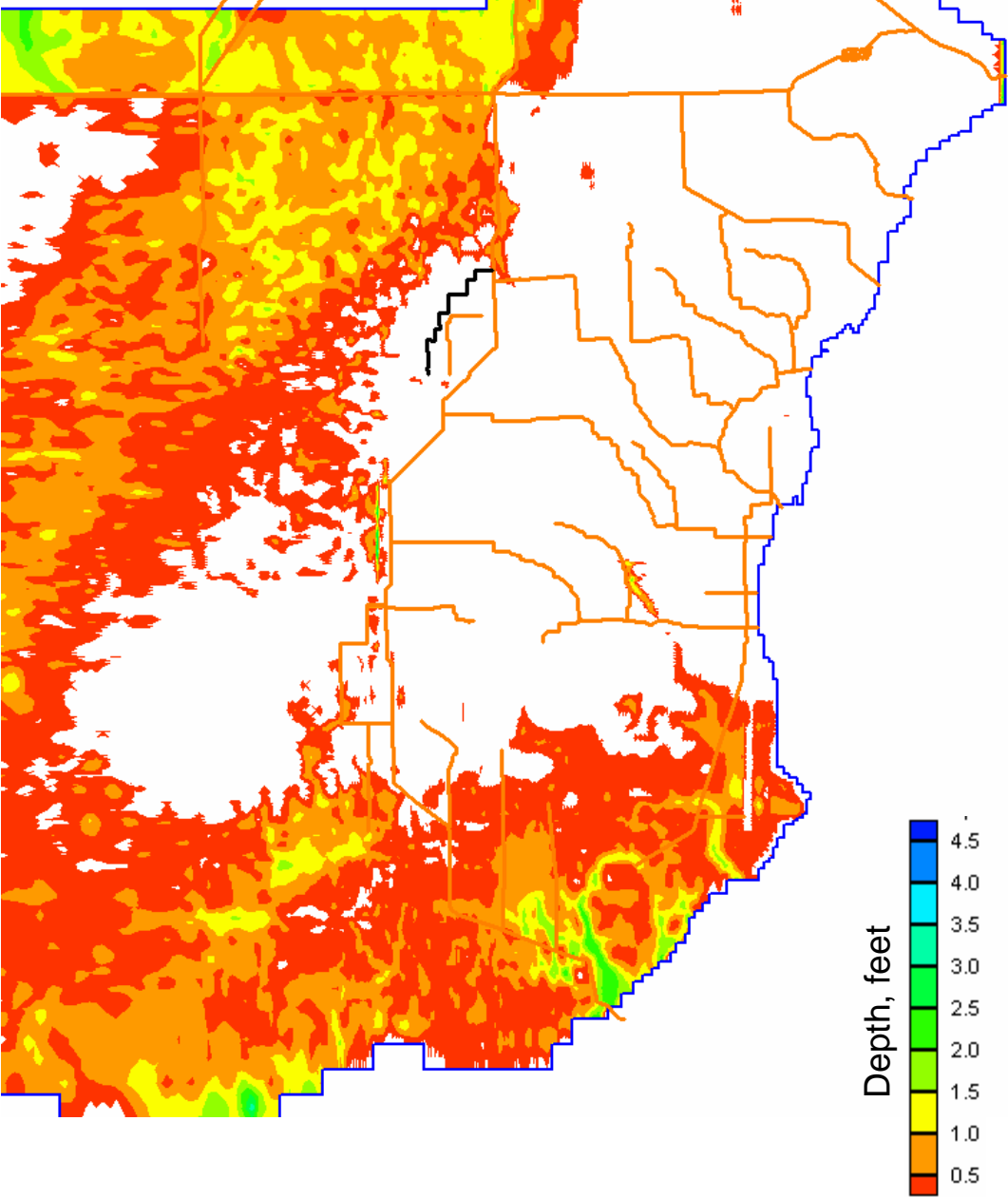
Peak Stage Ponding Depths (1989) Alt7R



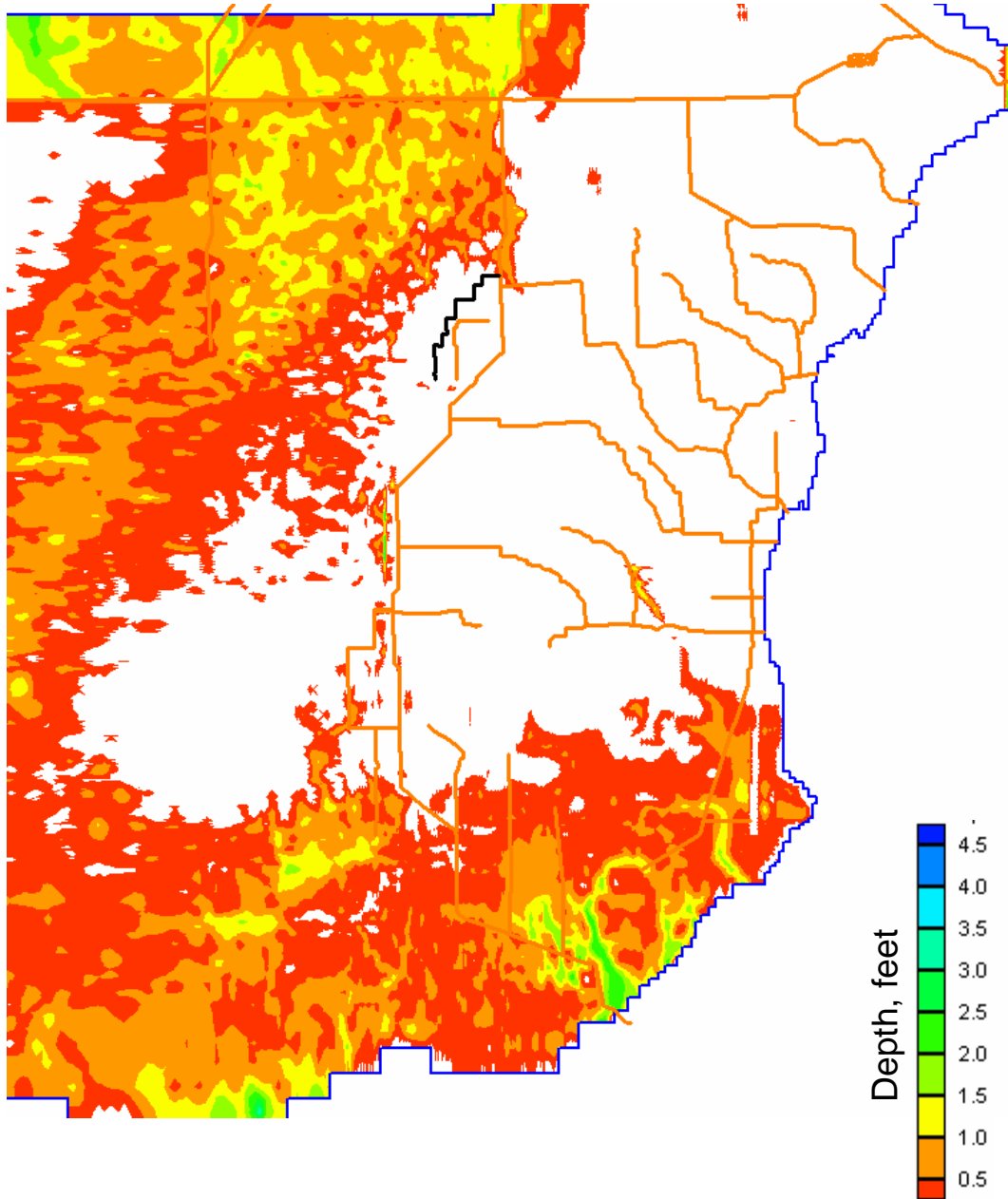
Peak Stage Ponding Depths (1989) Plan 6D



Peak Stage Ponding Depths (1989) Alt5

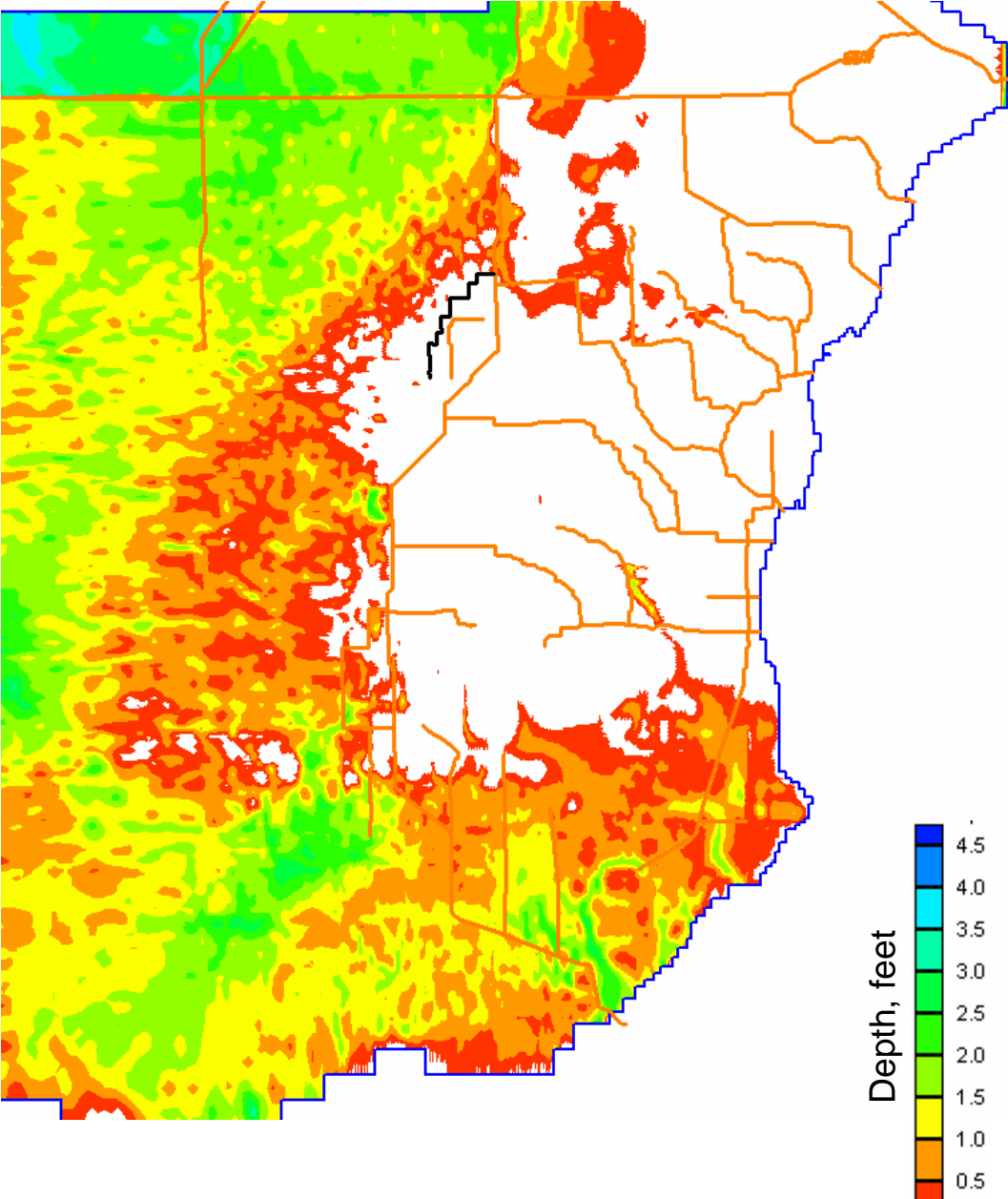


Peak Stage Ponding Depths (1989) Alt5R

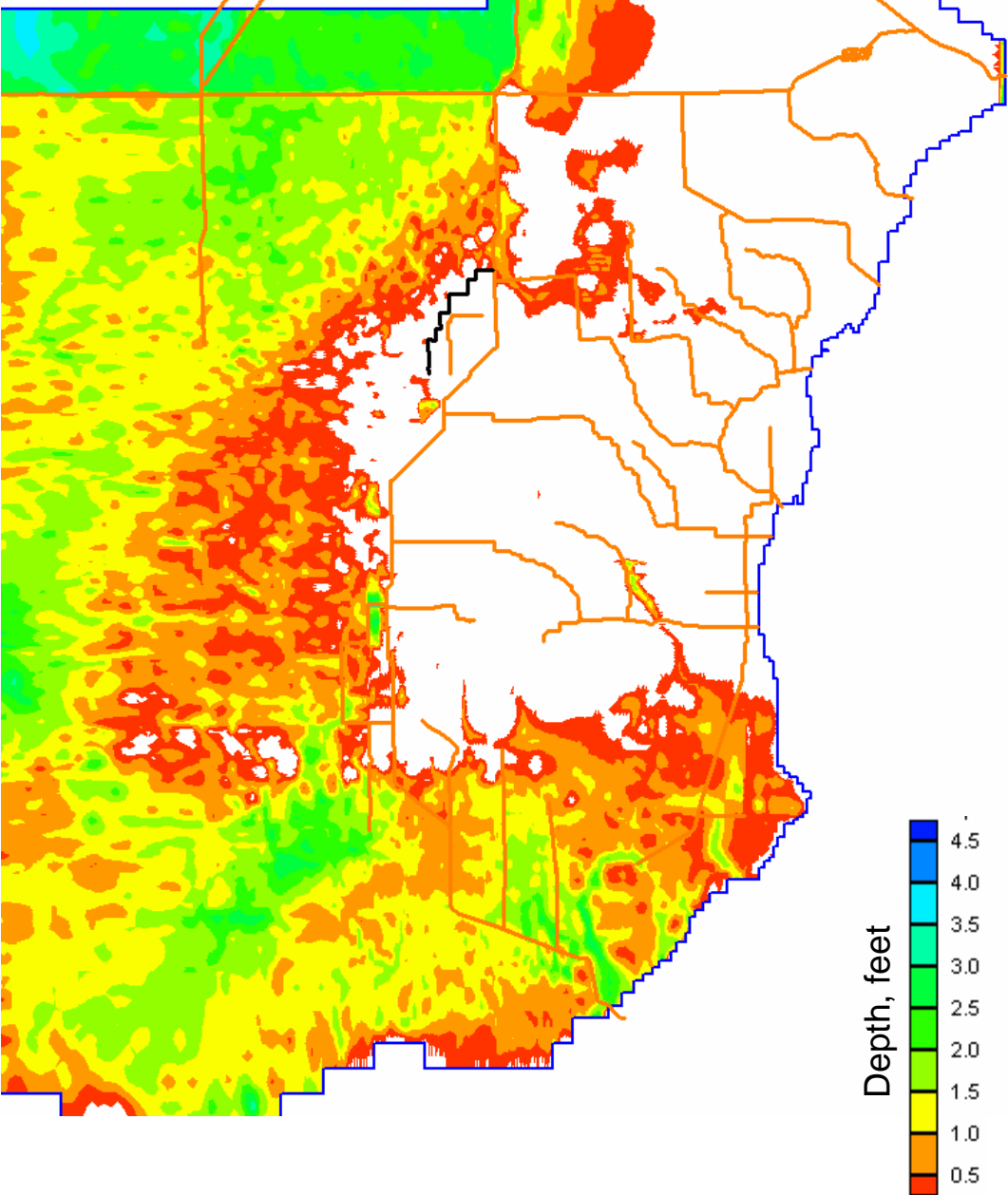


Peak Stage Ponding Depths for 1978 Average Year

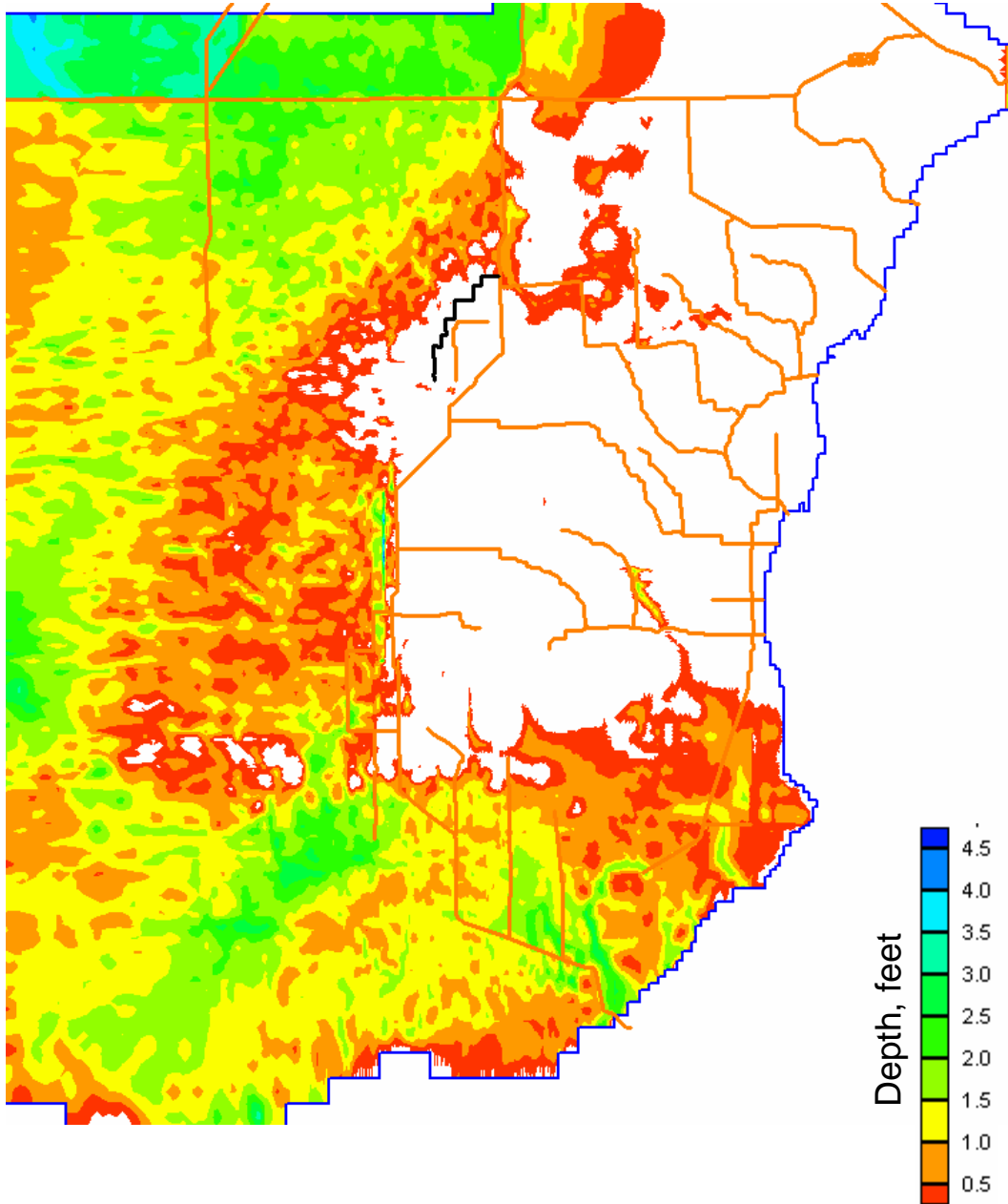
Peak Stage Ponding Depths (1978) Alt7R



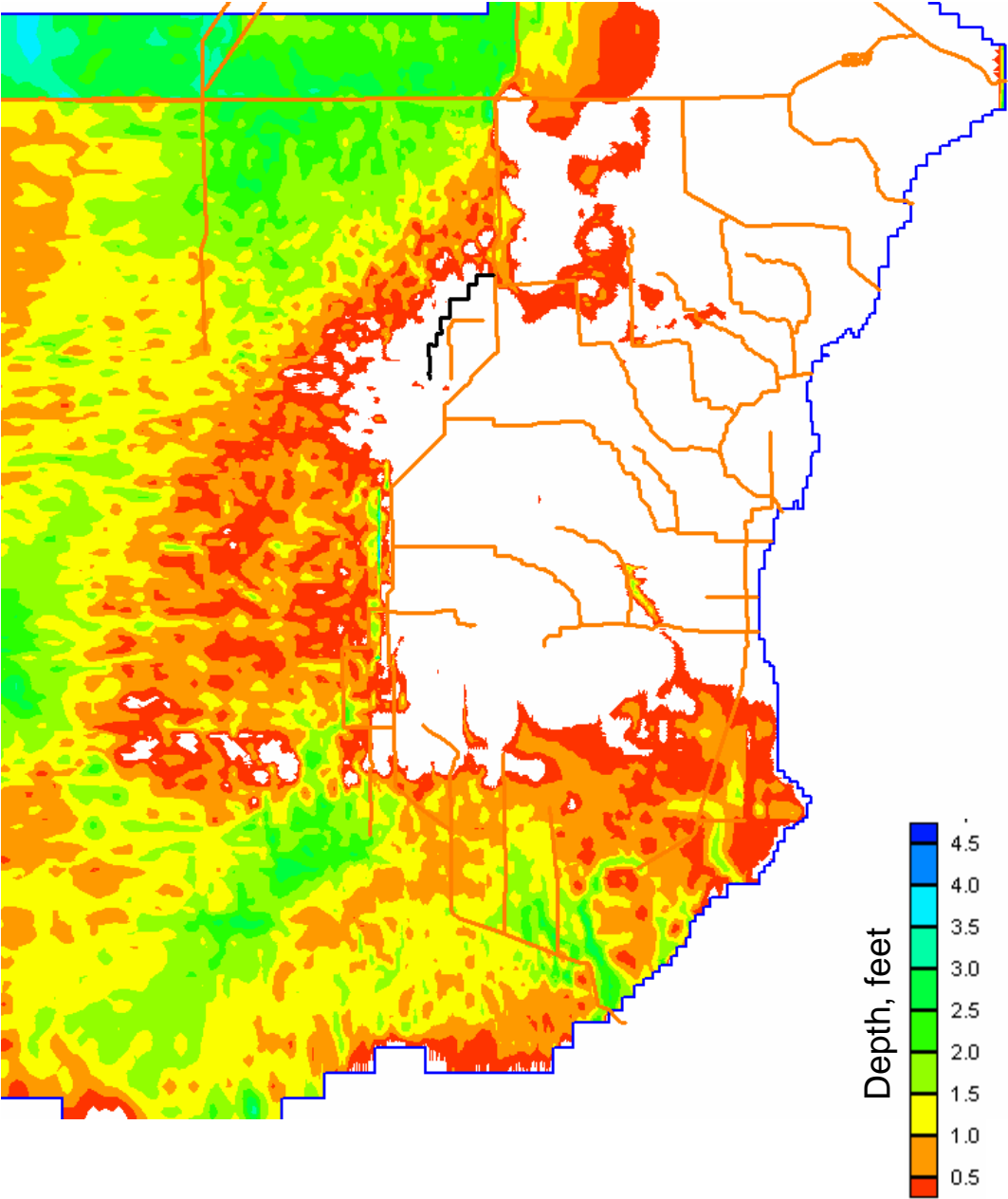
Peak Stage Ponding Depths (1978) Plan 6D



Peak Stage Ponding Depths (1978) Alt5



Peak Stage Ponding Depths (1978) Alt5R



Detention Pond Depths for 1995 Wet Year

Structures:

“P_Bw1”, “P_Bw2”, “P_Bw3”, “P_Bw4”, “P_Cw1”, “P_Cw2”, “P_Cw3”, “P_Cw4” are “stop log riser” culverts. Each contains two culverts with 3’ diameters. The crest elevations are 3.5 feet above ground elevation.

“Sherry” is a 300 ft wide weir which allows overflow to the west. The crest elevation is 9.5 feet. It is designed to pass half of the maximum of the combined discharge of S-332B, S-332C, and S-332D.

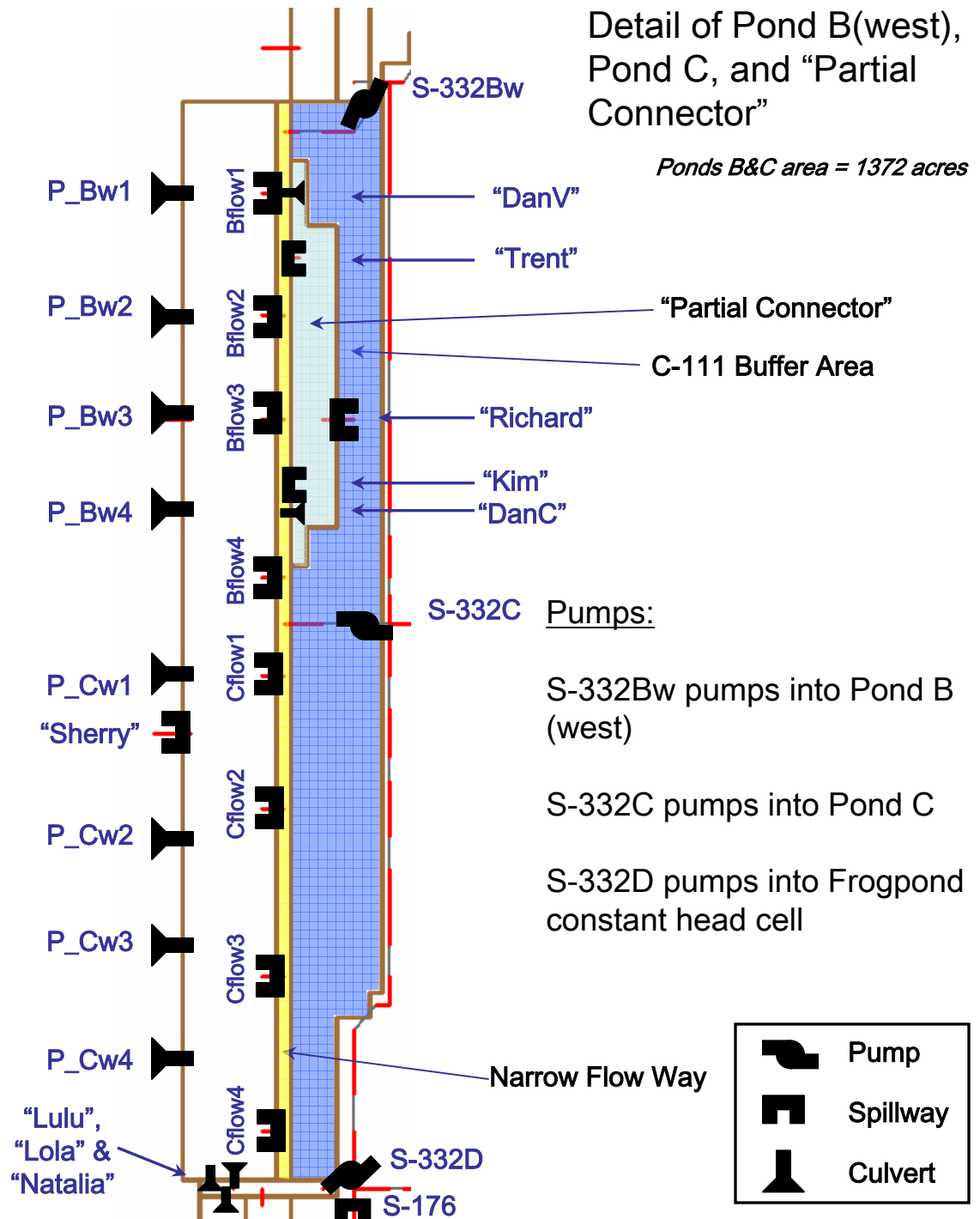
“DanV” is a culvert consisting of eight 4 ft diameter culverts from Pond B west into the “Partial Connector” (open stage > 9.5 ft).

“DanC” is a culvert consisting of fifteen 4 ft diameter culverts from Pond B west into the “Partial Connector” (open stage > 9.5 ft).

“Trent” and “Kim” are 350 ft wide weirs (crest elevation 9.5 feet) from Pond B west into the “Partial Connector”.

“Richard” is an emergency overflow weir from the “partial connector” into the C-111 buffer area. It is 1500 ft wide with a crest elevation of 10.1 feet.

Movement from the narrow flow way into Pond BC is over pseudo-structures Bflow1, Bflow2, Bflow3, Bflow4, Cflow1, Cflow2, Cflow3, and Cflow4. All are simulated as spillways with crest elevations of 8 ft and maximum capacity of 500 cfs each.



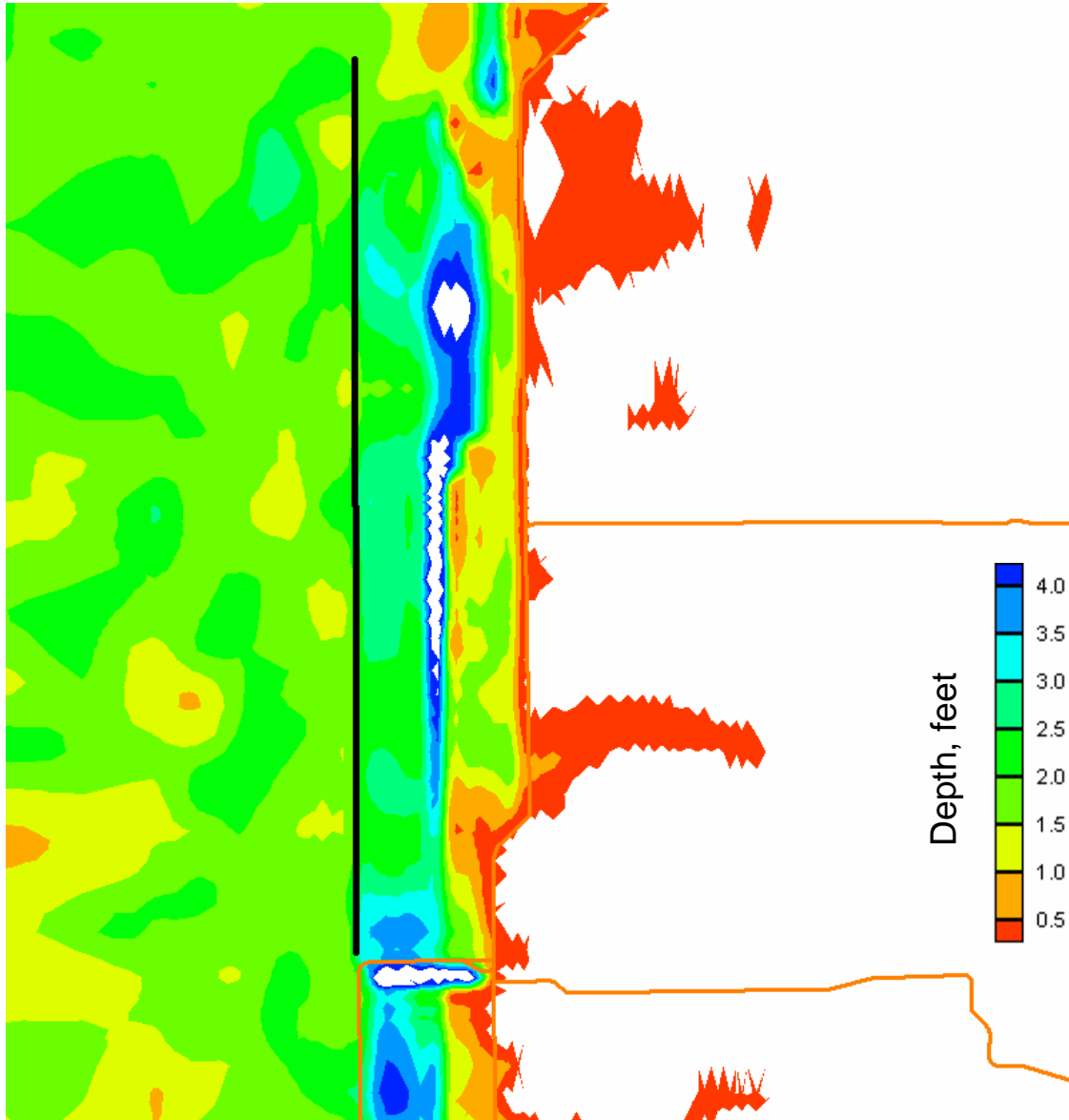
Pumps:

S-332Bw pumps into Pond B (west)

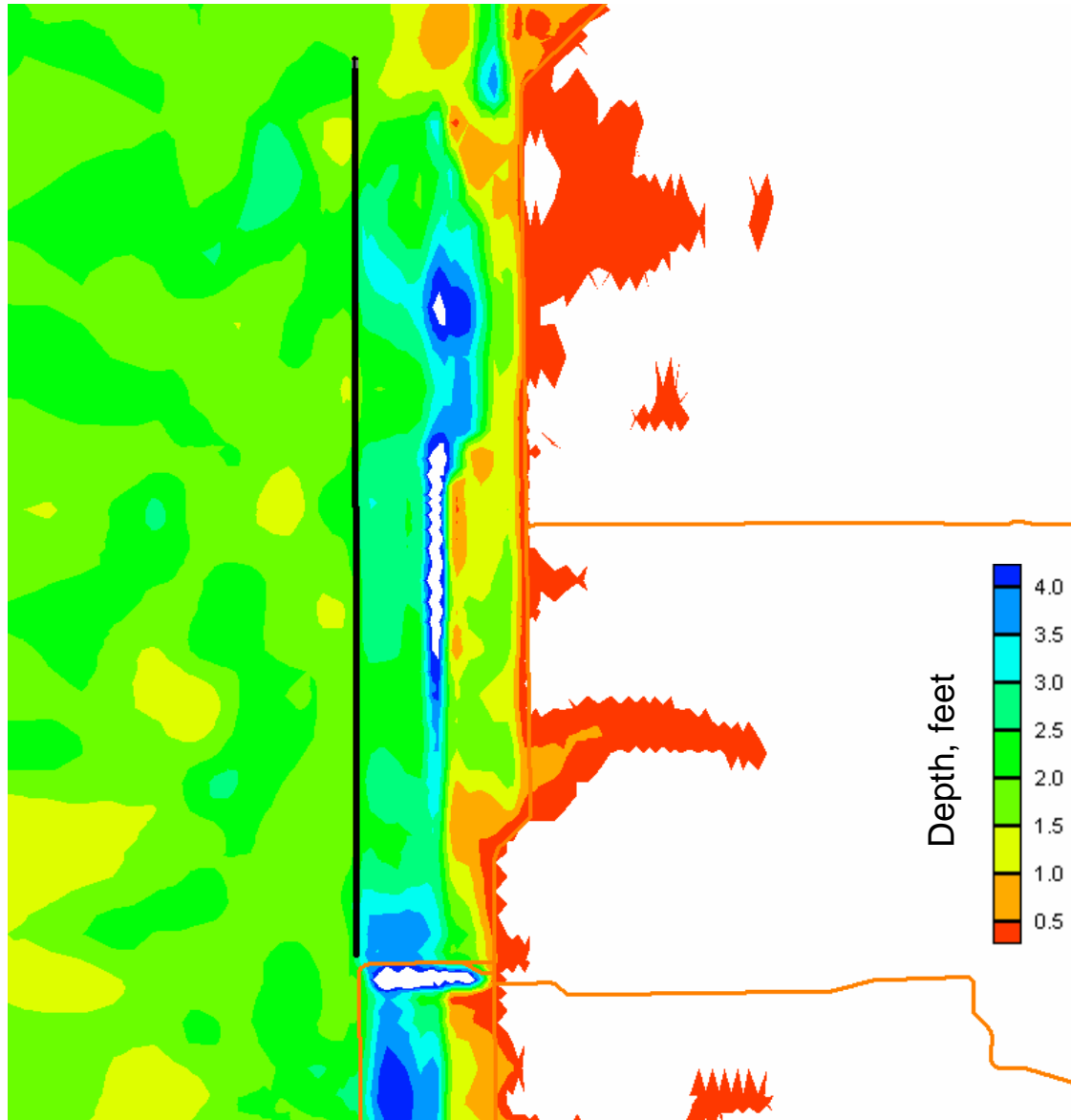
S-332C pumps into Pond C

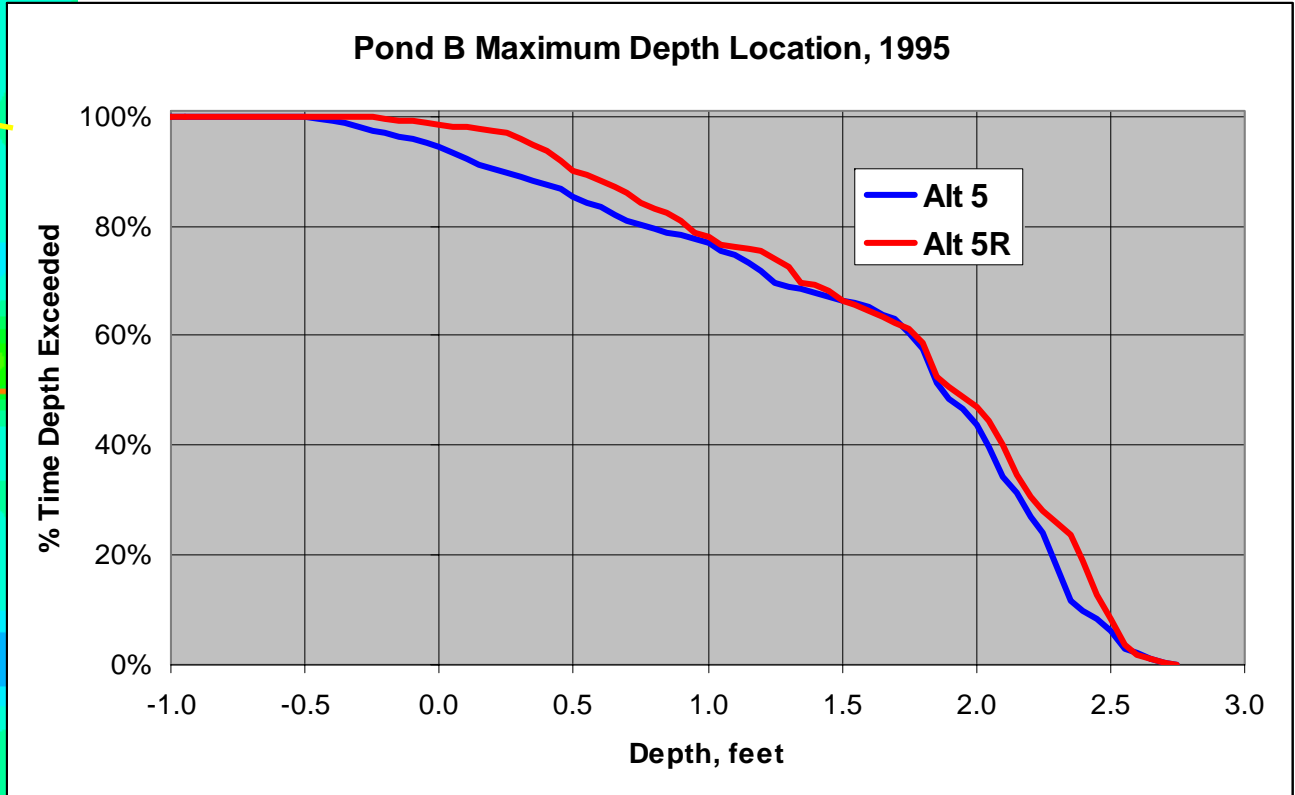
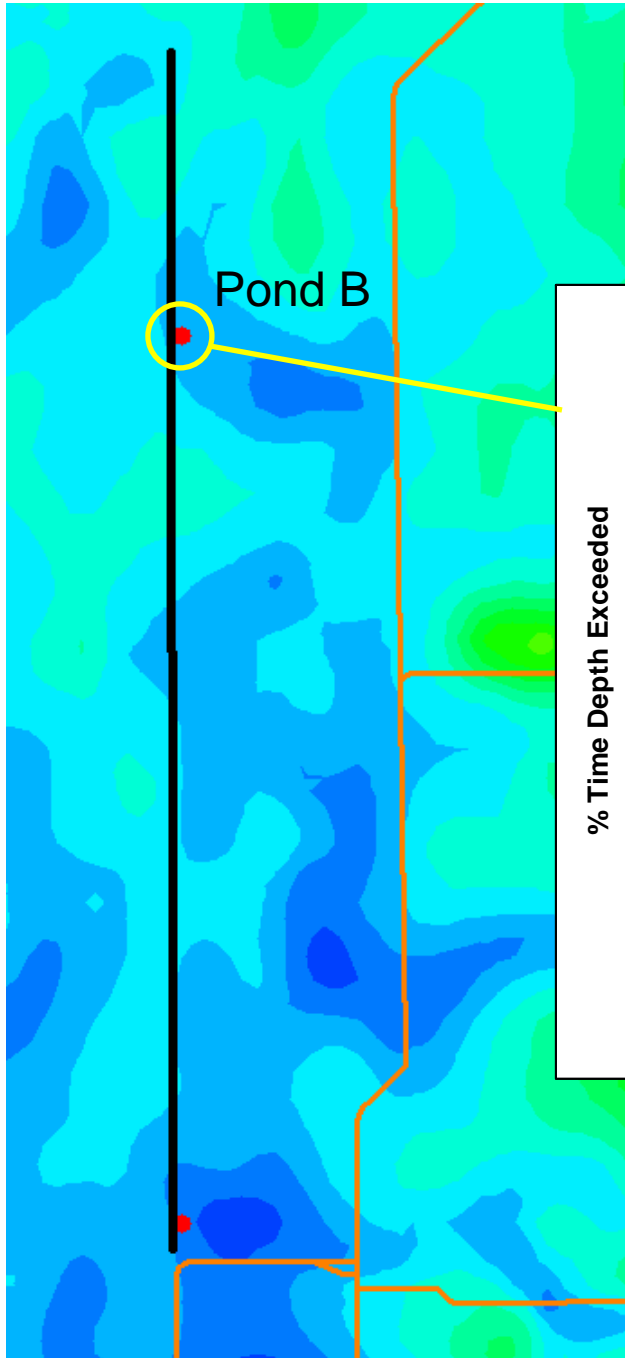
S-332D pumps into Frogpond constant head cell

Peak Stage Ponding Depths (1995) Alt5 in Detention Ponds

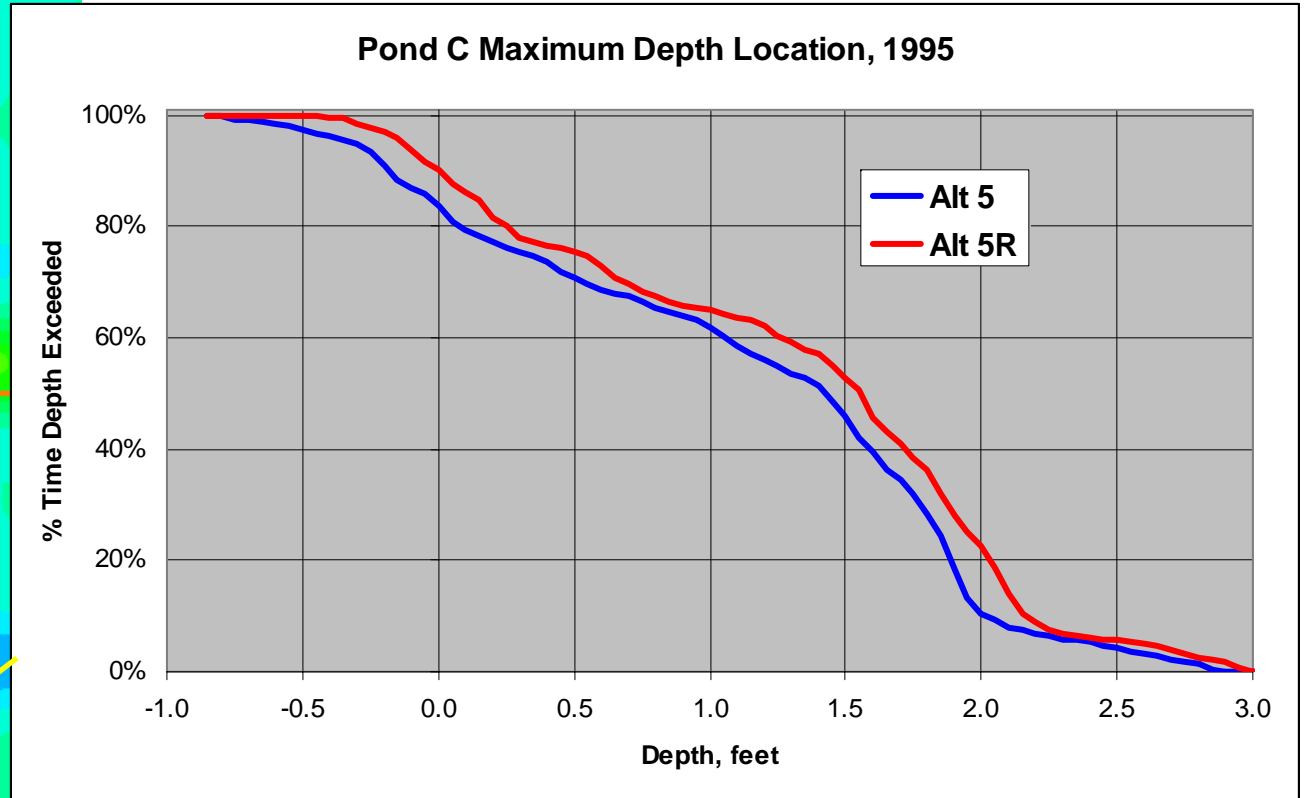
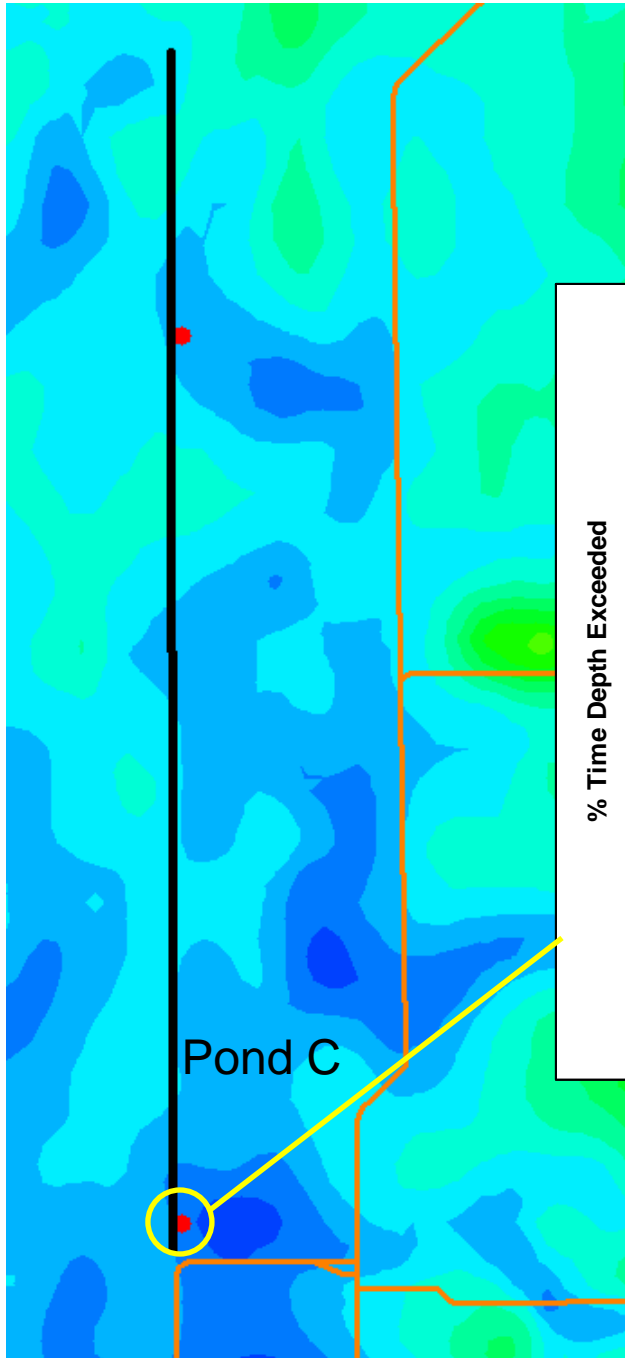


Peak Stage Ponding Depths (1995) Alt5R in Detention Ponds





*Local Ground Elevation
~5.7 feet NGVD29*

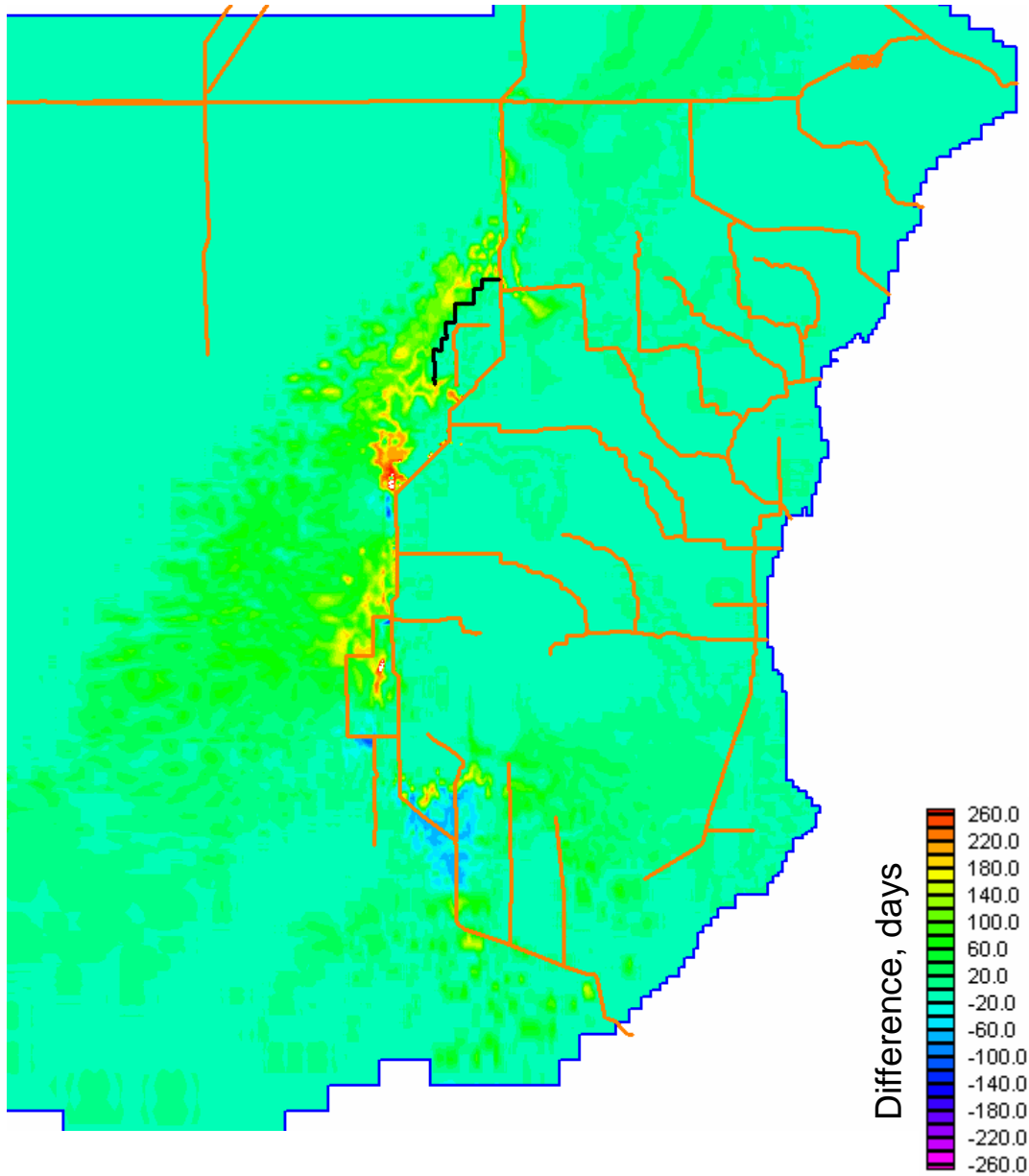


*Local Ground Elevation
~5.3 feet NGVD29*

MODBRANCH 1995 Simulation of
Alternative 5 and Alternative 5R
indicates NO overflow from
Detention Ponds into the
Everglades National Park

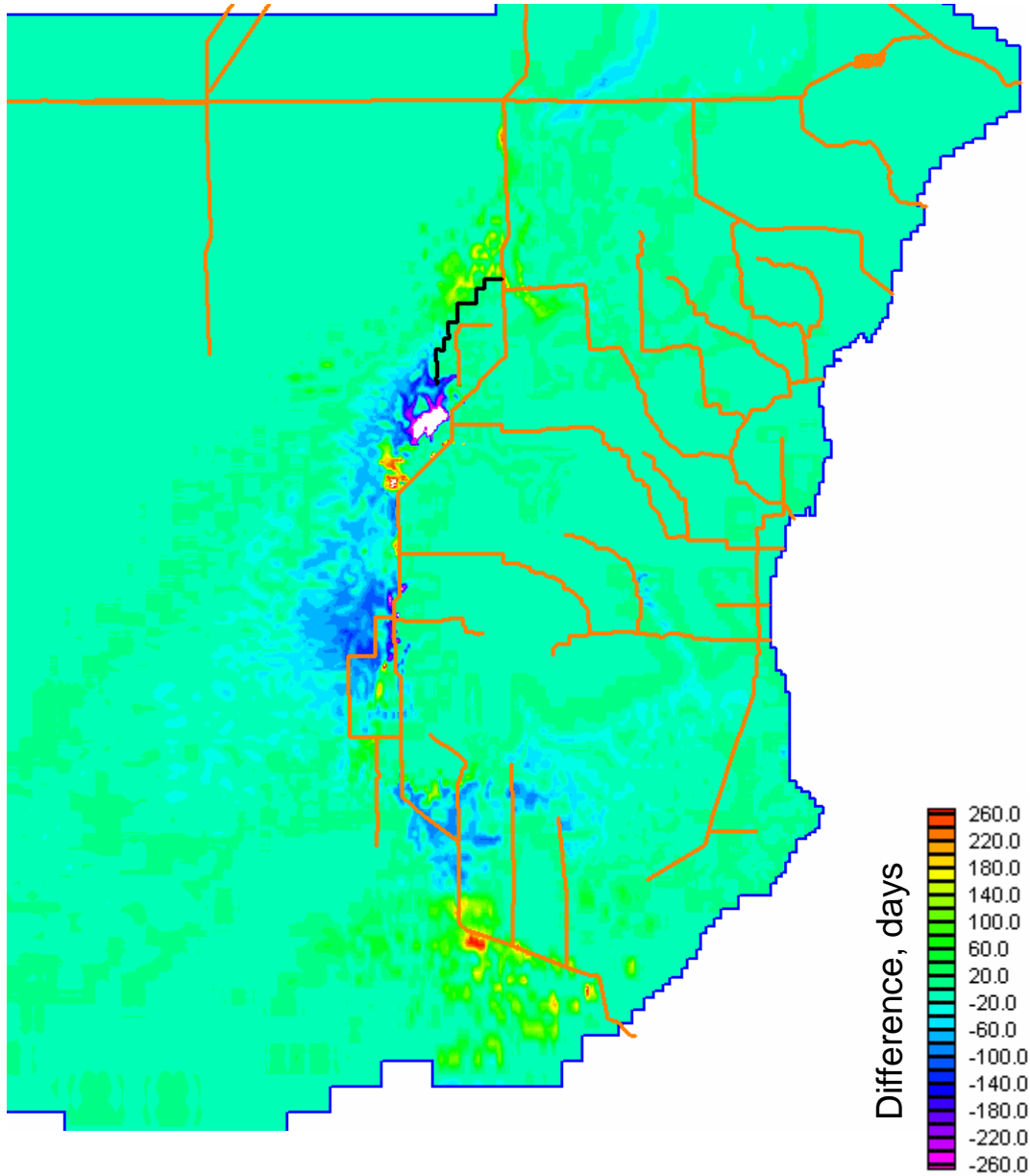
Hydroperiod Differences for 1995 Wet Year

Hydroperiod (1995) differences (Alt5 – Alt7R)



Alt5 tends to be wetter than Alt7R west of the canal.

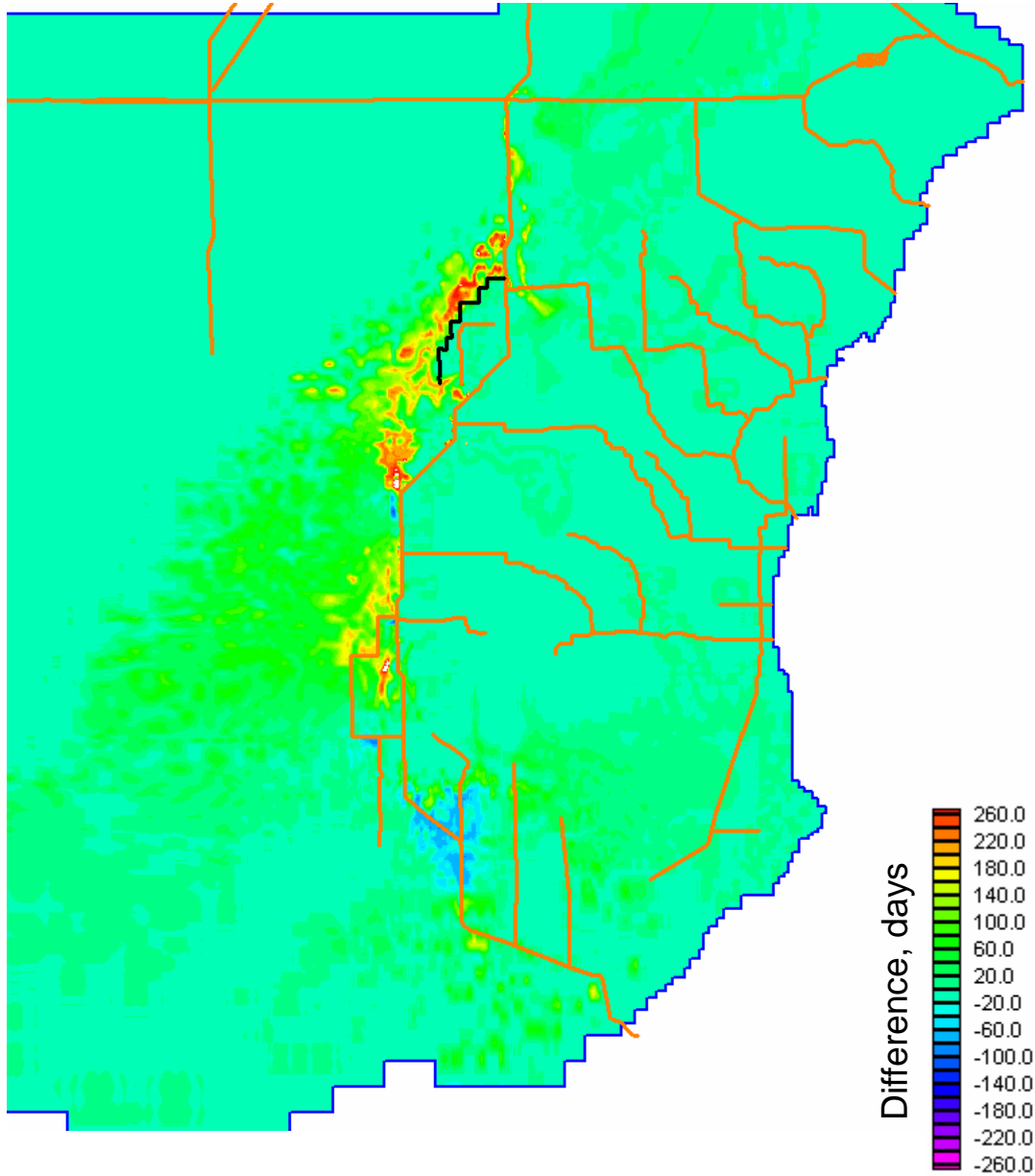
Hydroperiod (1995) differences (Alt5 – Plan 6D)



Alt5 is slightly wetter north of the 8.5 SMA.

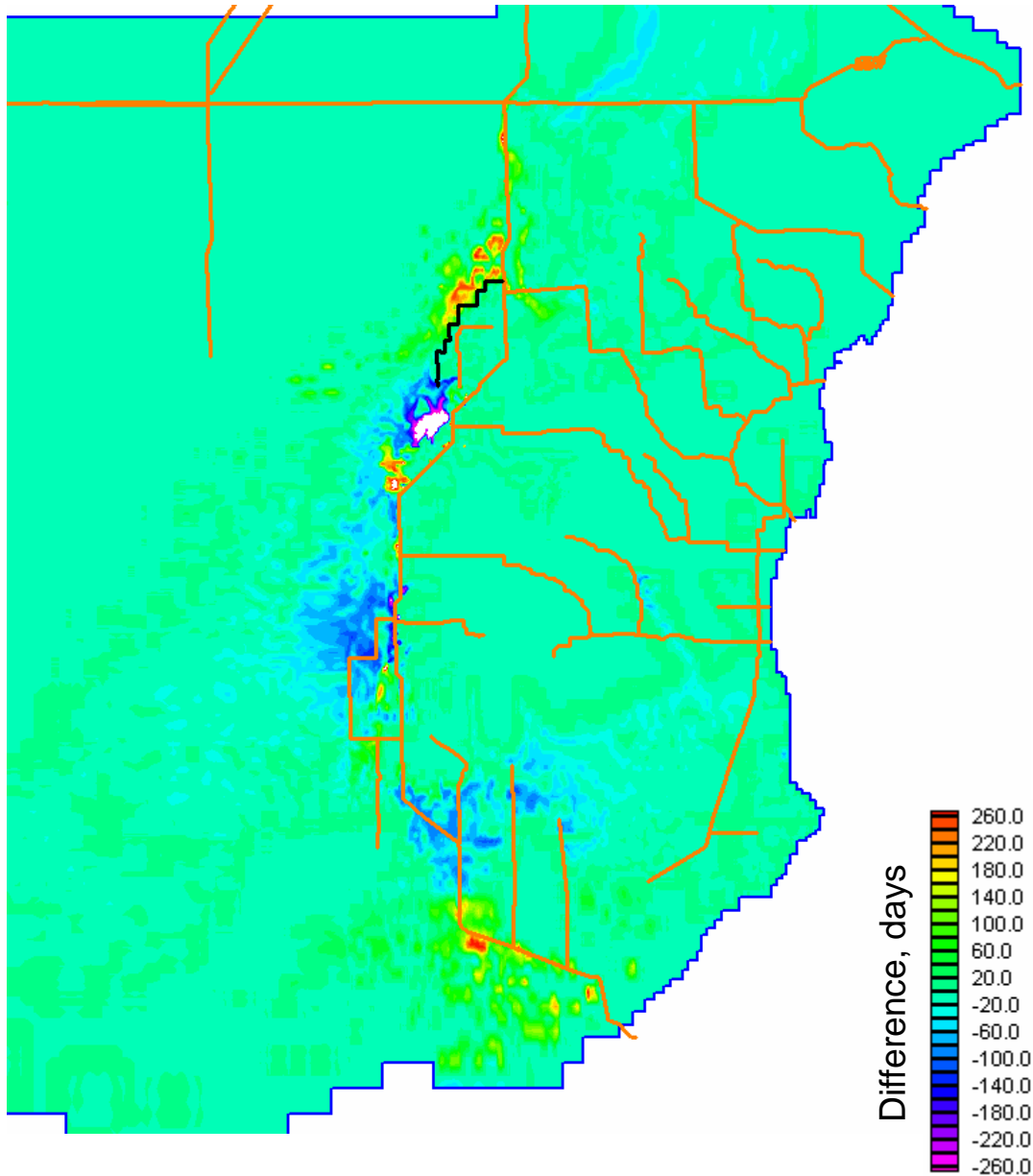
Alt5 tends to be drier than Plan 6D west of the canal.

Hydroperiod (1995) differences (Alt5R – Alt7R)



Alt5R tends to be wetter than Alt7R west of the canal.

Hydroperiod (1995) differences (Alt5R – Plan 6D)

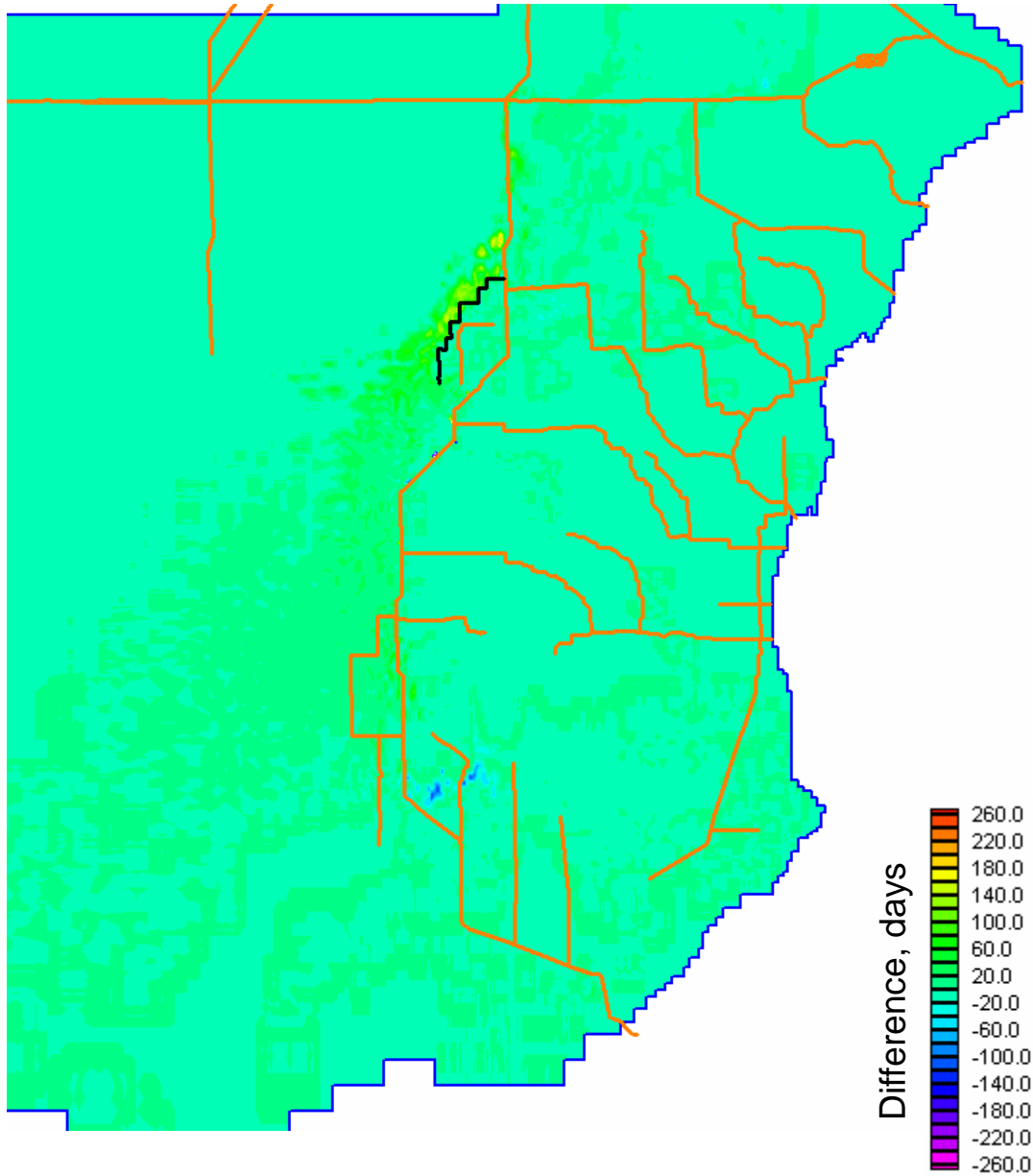


Alt5R tends to be drier than Plan 6D west of the canal and south of the 8.5SMA.

Alt5R tends to be wetter just north of the 8.5SMA.

Alt5R tends to be drier northwest of the Frogpond.

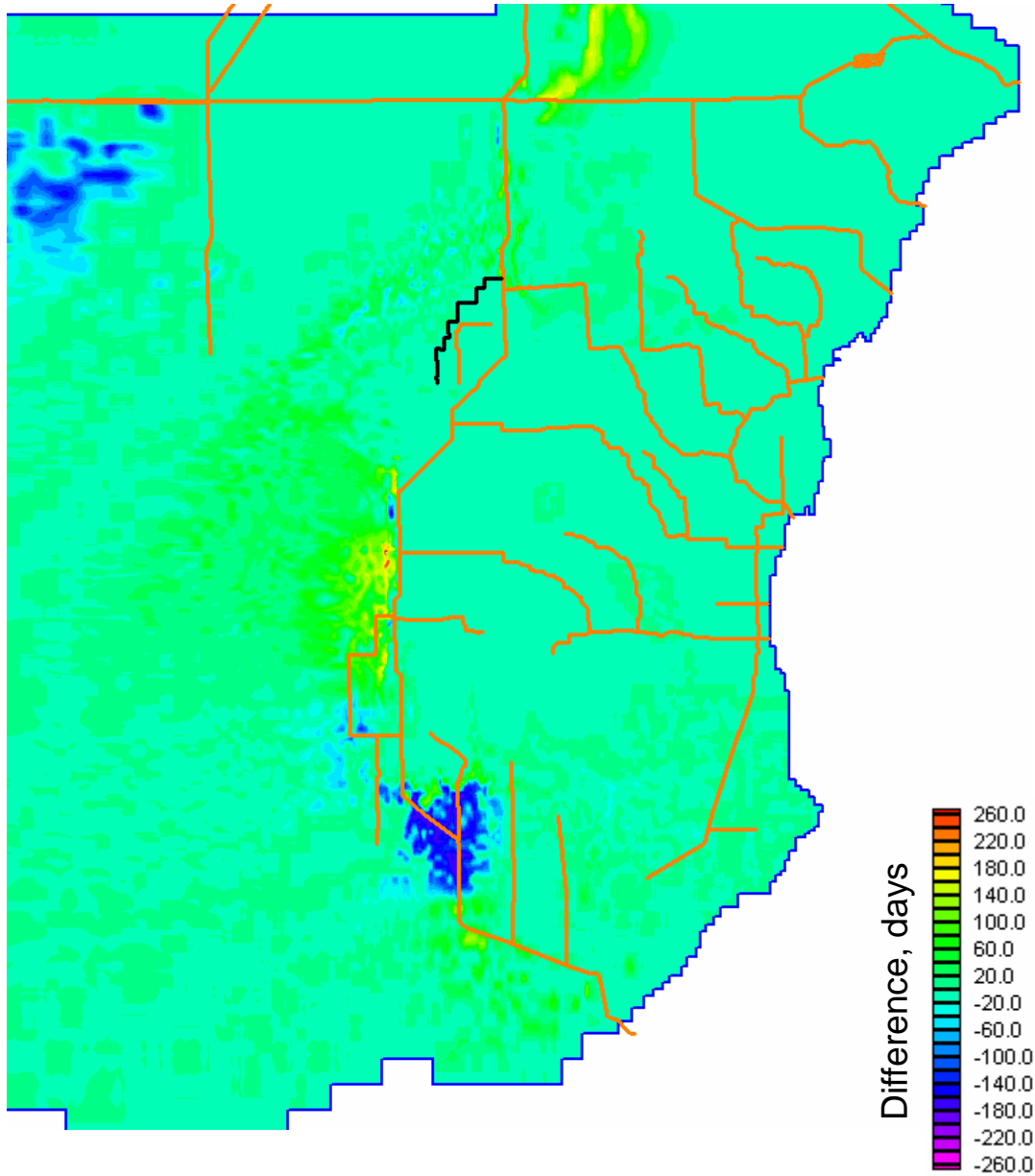
Hydroperiod (1995) differences (Alt5R – Alt5)



Alt5R tends to be slightly wetter than Alt5 west of the canal and west of the 8.5SMA.

Hydroperiod Differences for 1978 Average Year

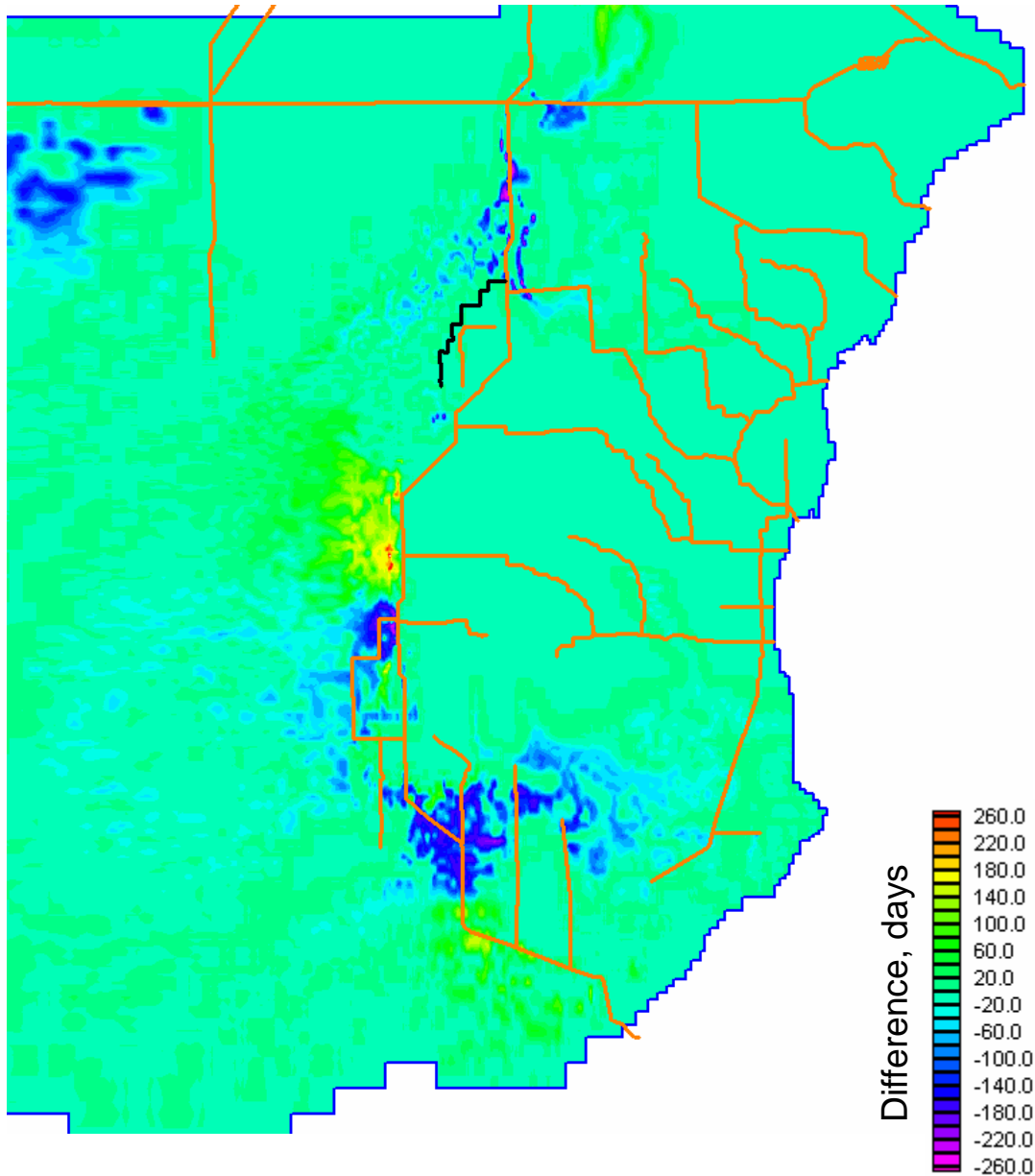
Hydroperiod (1978) differences (Alt5 – Alt7R)



Alt5 tends to be wetter than Alt7R west of the canal.

Alt5 tends to be drier than Alt7R lower end of C111 between S177 and S18c.

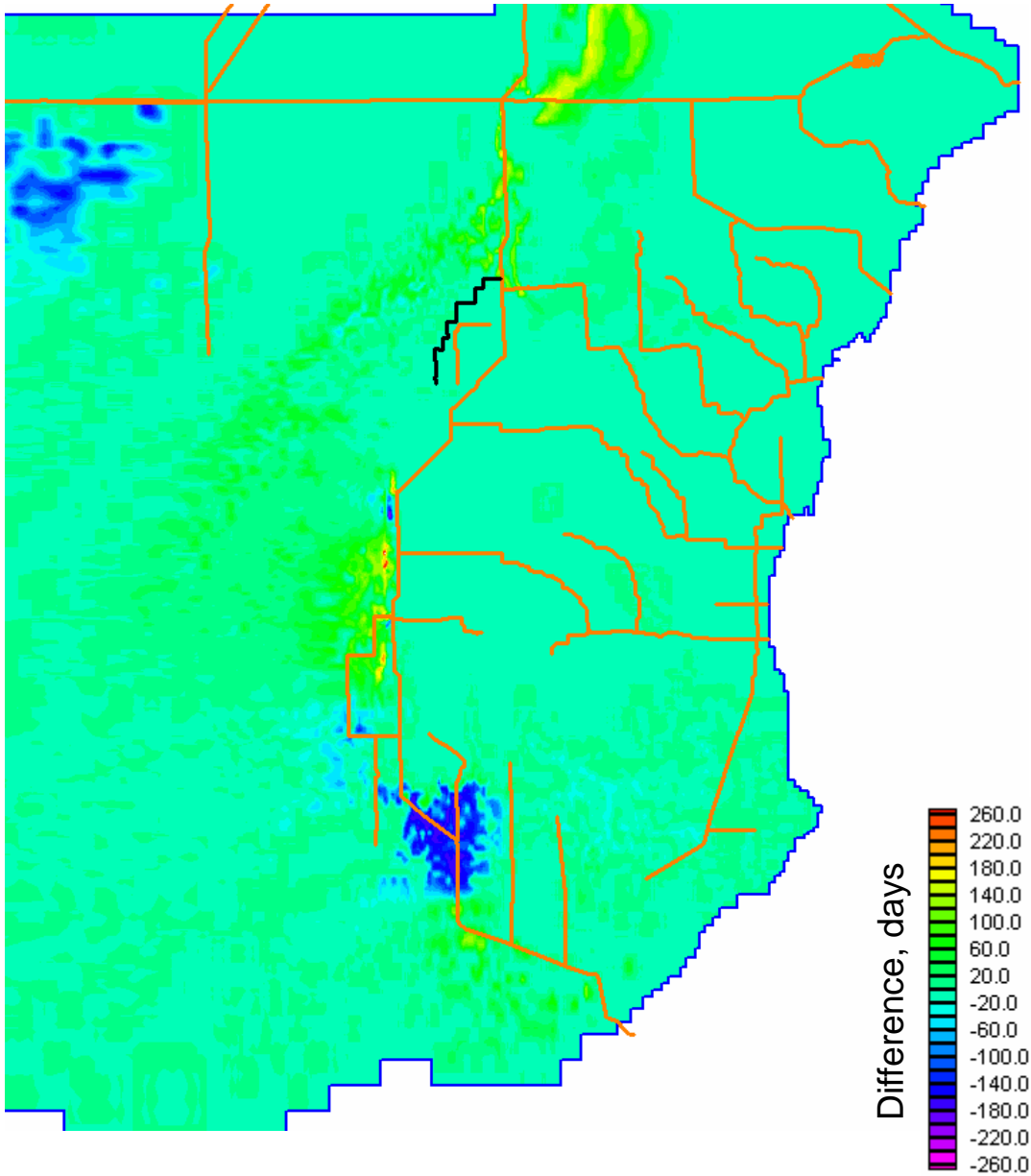
Hydroperiod (1978) differences (Alt5 – Plan 6D)



Alt5 tends to be wetter than Plan 6D west of the detention ponds, but drier along L31N between L29 and C1.

Alt5 tends to be drier than Plan 6D in the north part of the Frogpond and the lower end of C111 between S177 and S18c.

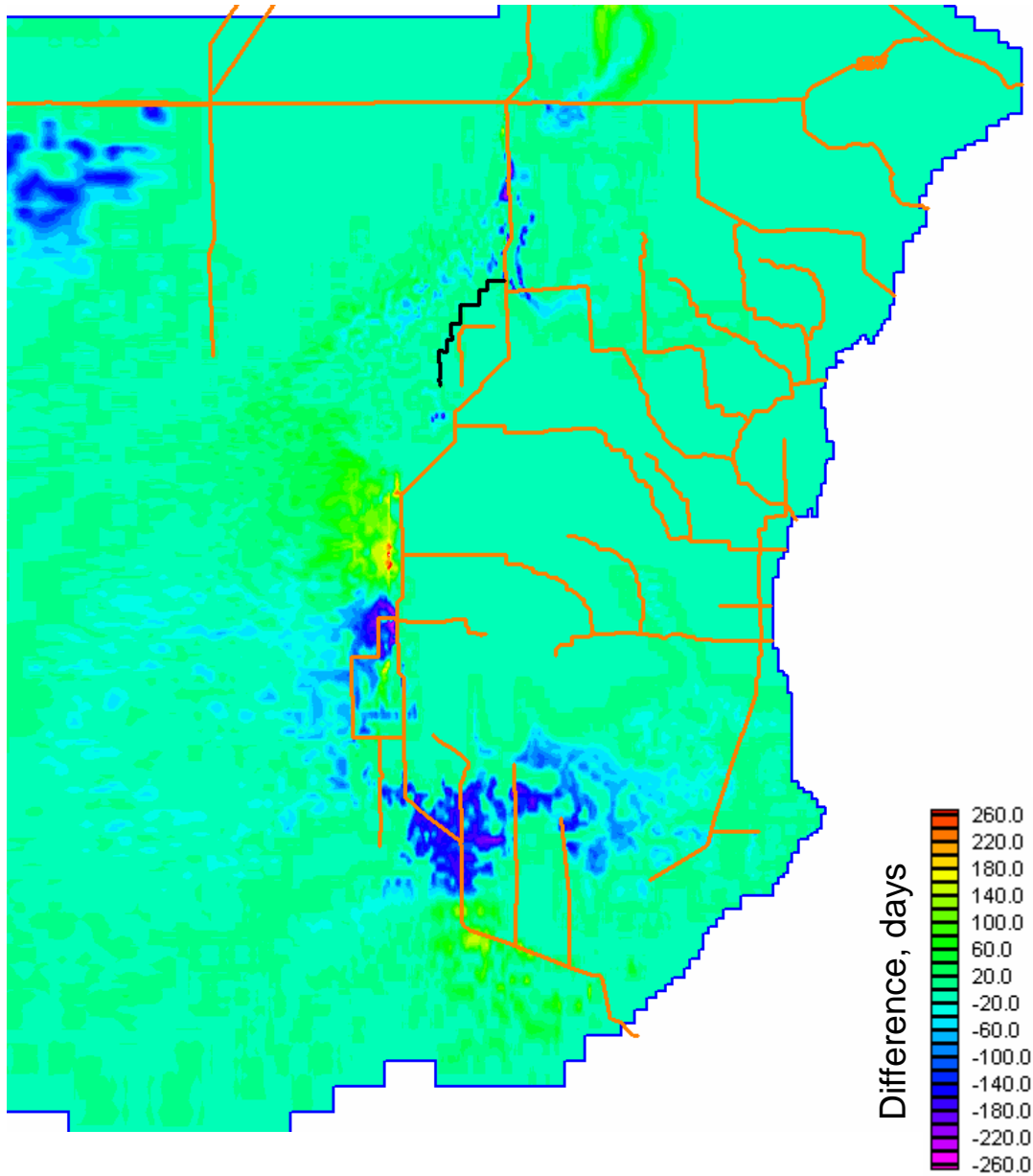
Hydroperiod (1978) differences (Alt5R – Alt7R)



Alt5R tends to be wetter than Alt7R west of the canal.

Alt5R tends to be drier than Alt7R lower end of C111 between S177 and S18c.

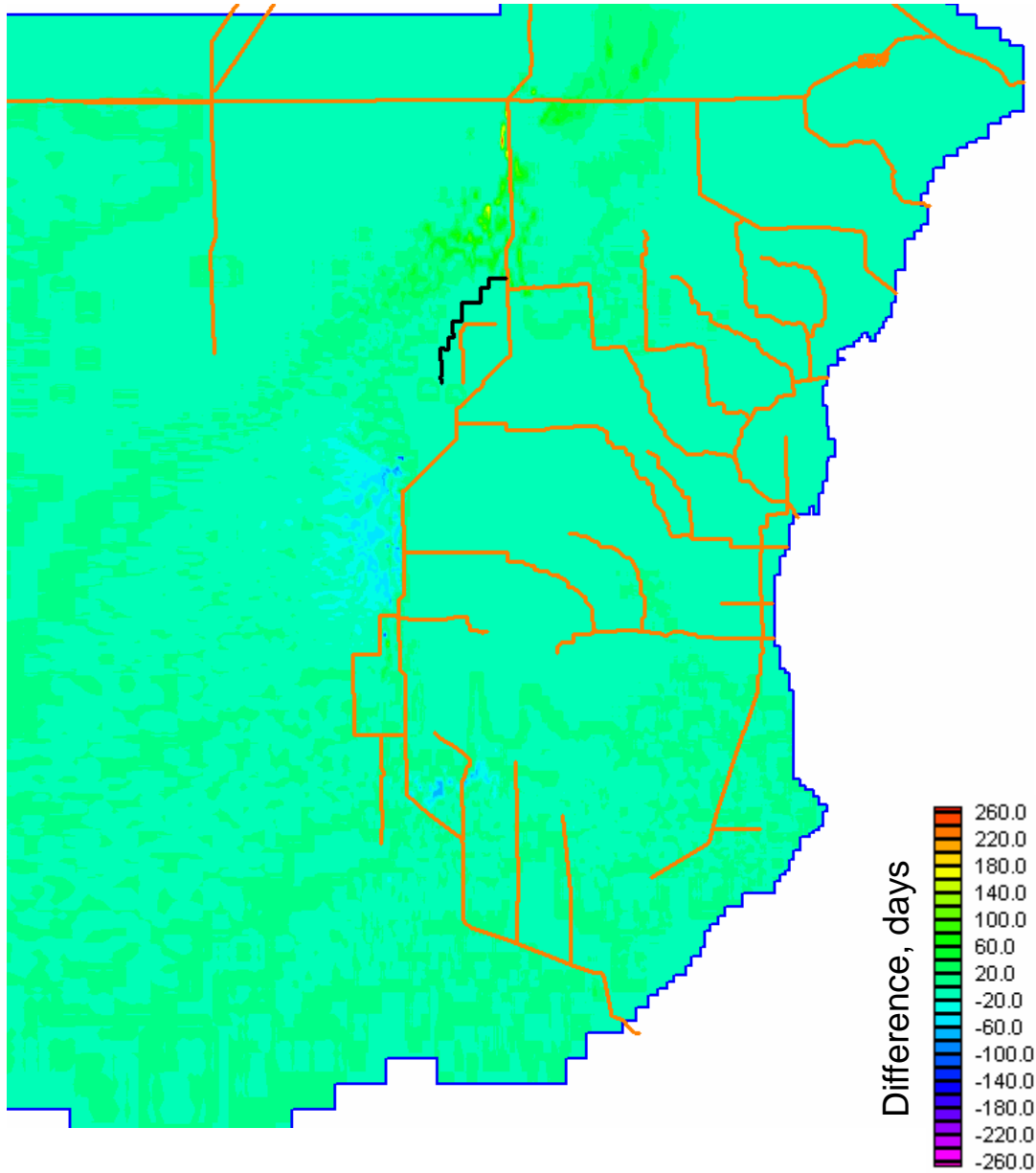
Hydroperiod (1978) differences (Alt5R – Plan 6D)



Alt5R tends to be slightly wetter than Plan 6D west of the canal.

Alt5R tends to be drier than Plan 6D in north part of Frogpond and the lower end of C111 between S177 and S18c.

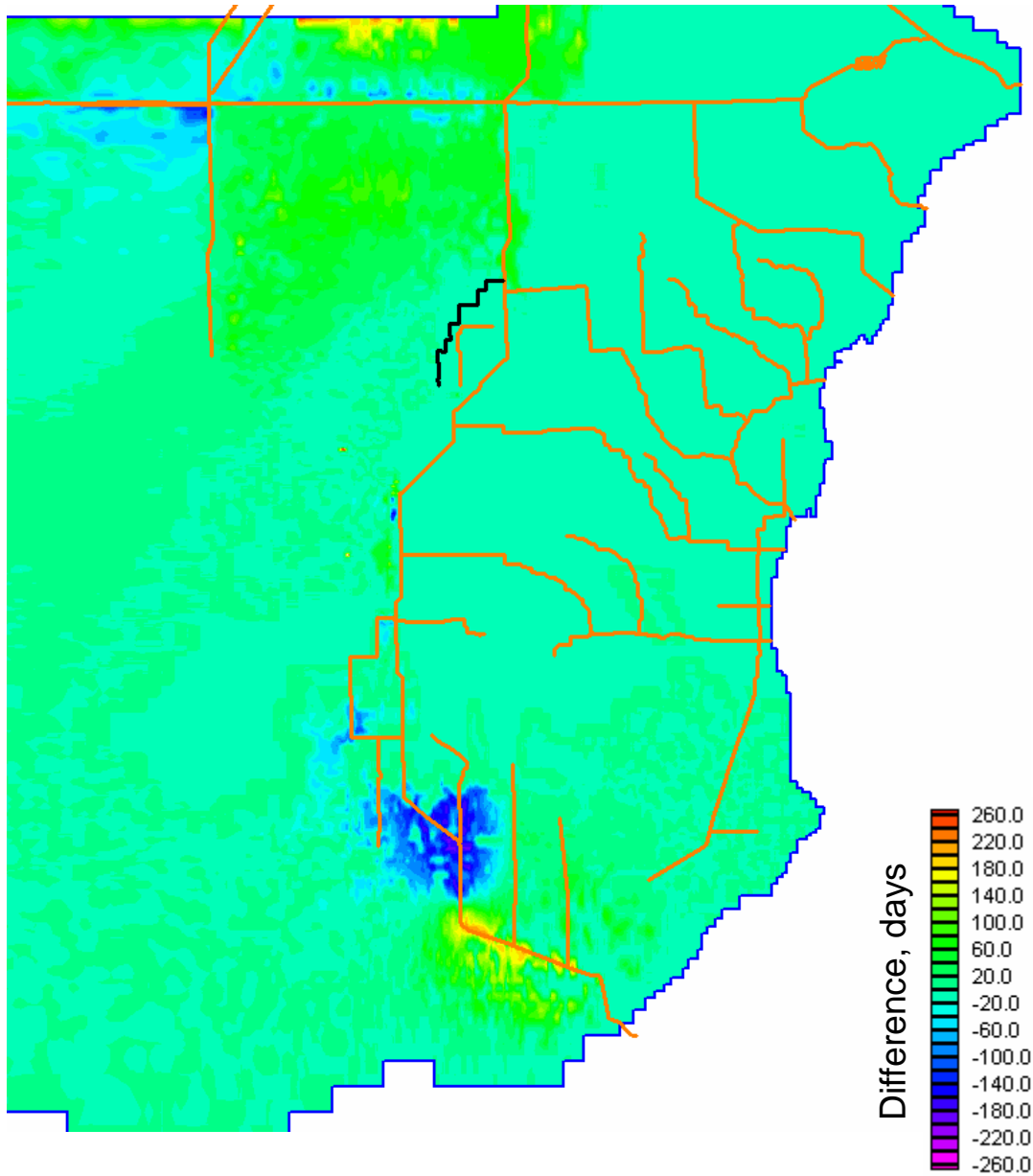
Hydroperiod (1978) differences (Alt5R – Alt5)



Alt5R tends to be slightly wetter than Alt5 northwest of the 8.5SMA.

Hydroperiod Differences for 1989 Dry Year

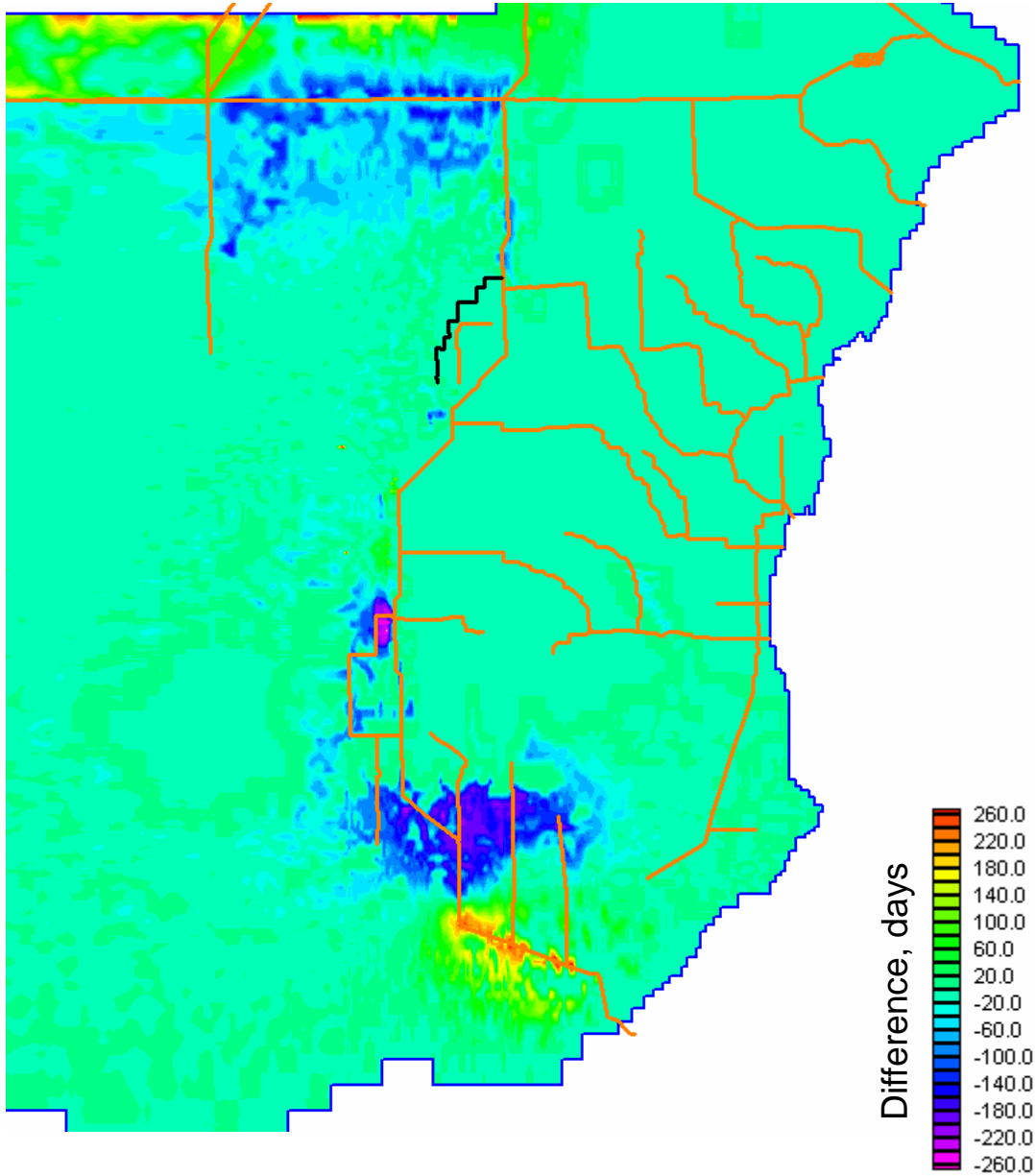
Hydroperiod (1989) differences (Alt5 – Alt7R)



Alt5 tends to be wetter than Alt7R in NESRS.

Alt5 tends to be drier than Alt7R in the lower end of C111, but wetter south of S18c.

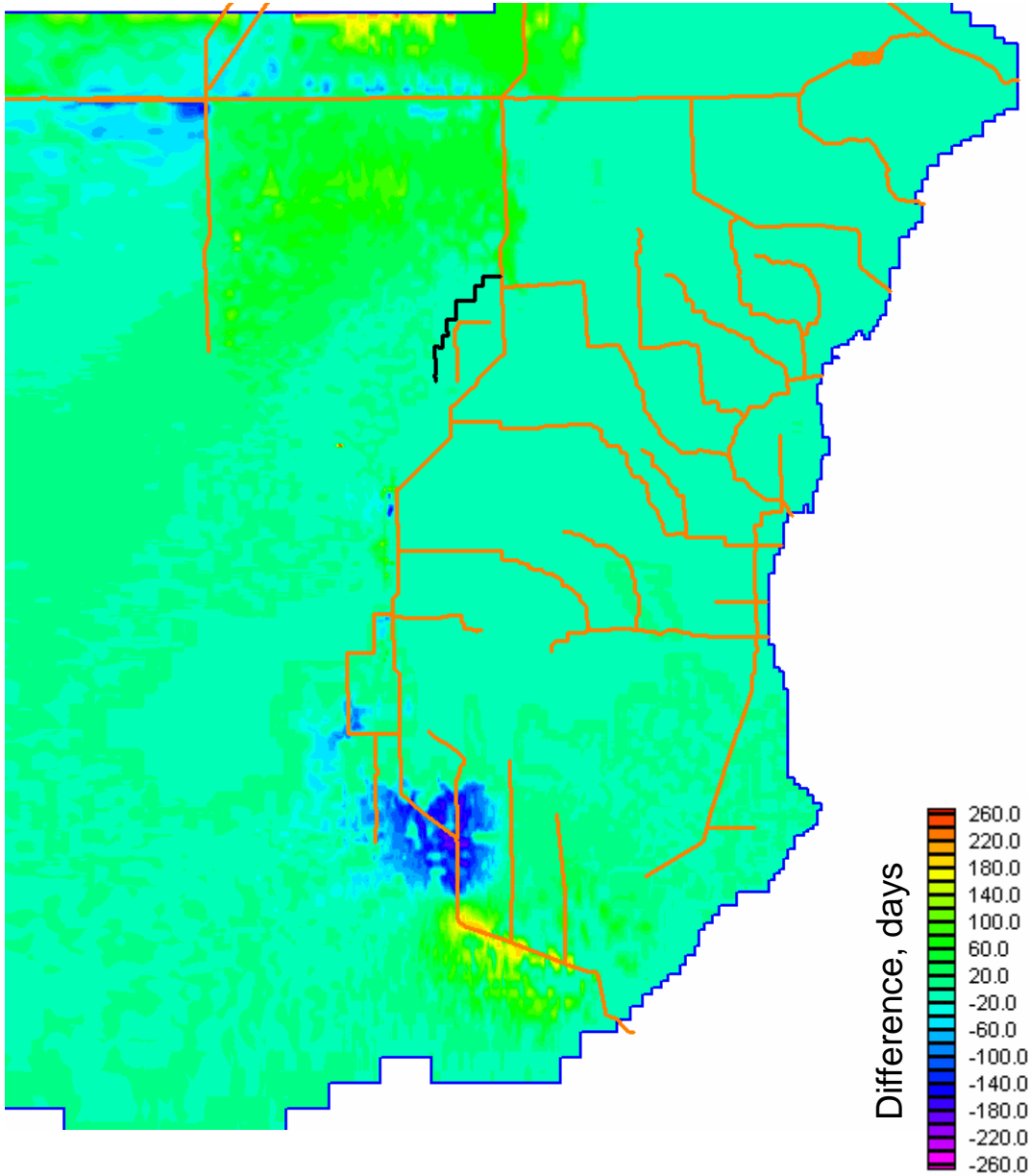
Hydroperiod (1989) differences (Alt5 – Plan 6D)



Alt5 tends to be drier than Plan 6D in NESRS.

Alt5 tends to be drier than Plan 6D in the north part of the Frogpond and the lower end of C111, but wetter south of S18c.

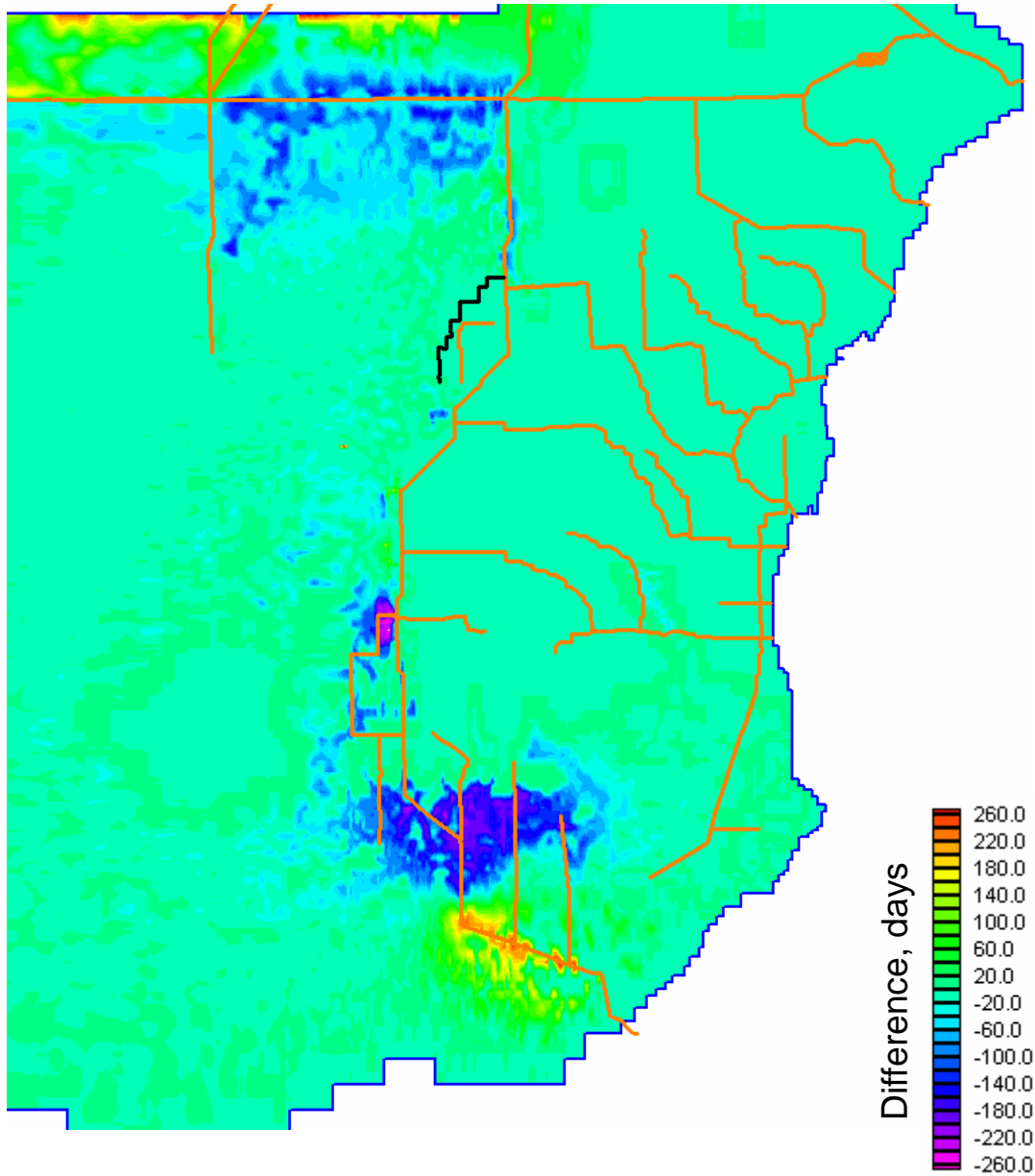
Hydroperiod (1989) differences (Alt5R – Alt7R)



Alt5R tends to be drier than wetter than Alt7R in NESRS.

Alt5R tends to be drier than Alt7R in the lower end of C111, but wetter south of S18c.

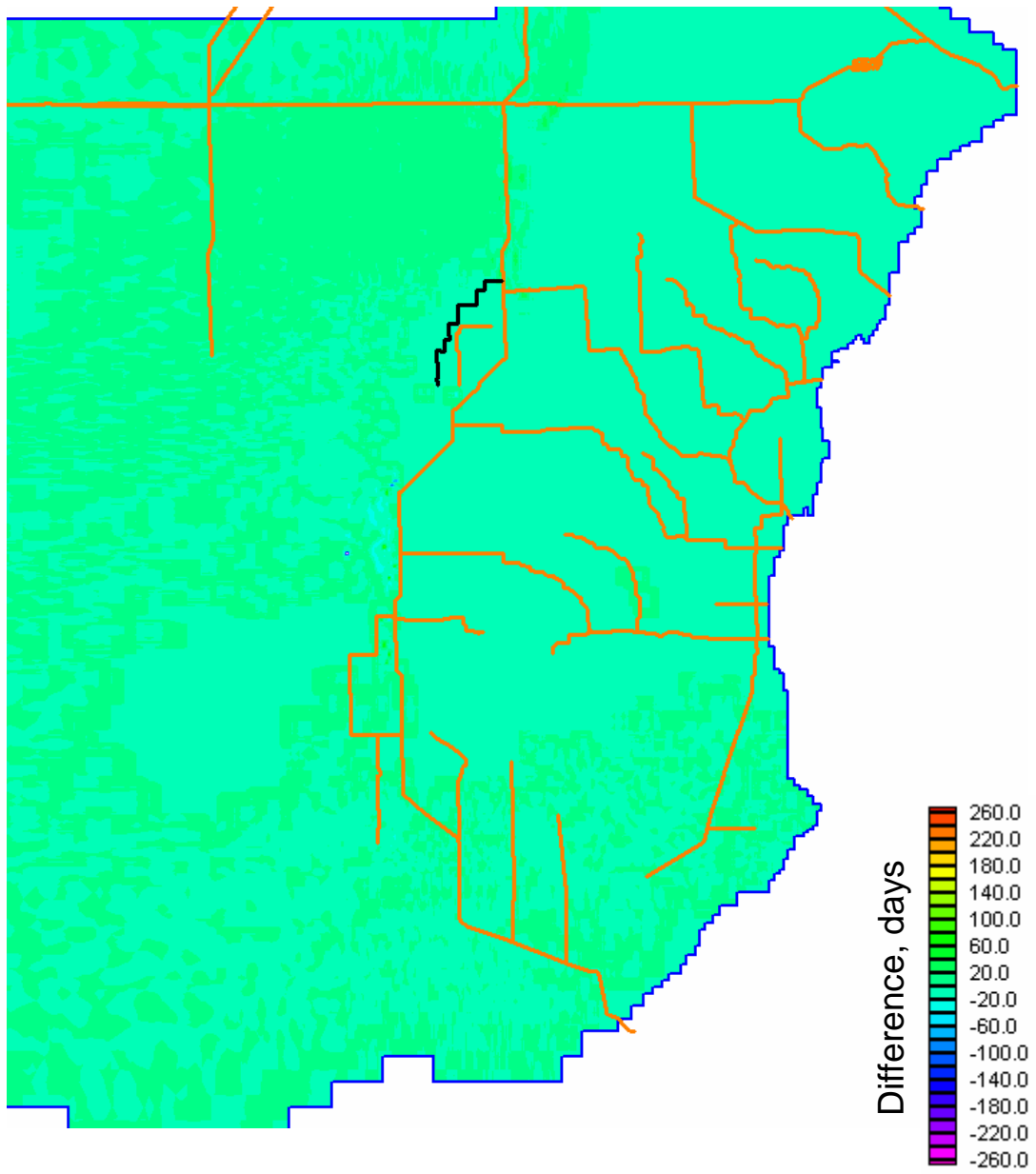
Hydroperiod (1989) differences (Alt5R – Plan 6D)



Alt5R tends to be drier than Plan 6D in NESRS.

Alt5R tends to be drier than Plan 6D in the north part of the Frogpond and the lower end of C111, but wetter south of S18c.

Hydroperiod (1989) differences (Alt5R – Alt5)



Alt5R tends to be slightly wetter than Alt5 in NESRS.

Questions?