CFWI Hydrologic Analysis Team Status

August 23, 2012

Presented by
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Status of USGS Modeling

Delivered:

- The USGS ECFT Groundwater Model.
- Initial four scenarios for which water use data was prepared by the HAT.

Preliminary Assessment by HAT:

- Preliminary evaluation completed by HAT in August.
- No fatal flaws identified to date.
- Model modifications/refinements are necessary before the model can be used for CFWI.
- Two outstanding evaluation issues with potential for significant schedule impact were identified:
  - Agricultural demands in calibration period.
  - Model water budget.

Preliminary Evaluation

Approach

- Initial assessment based on a three week preliminary model evaluation.
- Used a split team approach to ensure review covered a broad base (sub-teams reviewed different aspects of the model).
- Met frequently to share and discuss early findings.
- More detailed evaluation will continue through the project duration.

Objectives

- Determine if there were any obvious fatal flaws that render the model unusable.
- Determine if the model can be used as is.
- Identify what modifications to the model are necessary.

Considerations

Modification Type

- Modifications based on preferences: Things we would like fixed but can live without.
- Modifications based on expediency: Things that can be retained but are difficult to defend.
- Essential modifications: Things that are wrong and have to be fixed.

Schedule Impact

- Minor modifications not requiring model recalibration (2 – 3 months).
- Major modifications requiring model recalibration (6 – 9 months).

Consequence

- USGS Model “authorship” transferred to the HAT/WMDs.

Outcome

Modification Necessary

- Minor modifications necessary.
- Potentially major modifications necessary to address use of mixed vertical datum data in the model.
- Additional major modifications not ruled out pending completion of water budget analyses and resolution of agricultural demand issue.

Schedule Impact

- Schedule impact of major and minor modifications will be in the six to nine month range.
- Options to reduce recalibration time by leveraging USGS familiarity and tools from recently completed calibration are being explored.

HAT Ongoing / Upcoming Activities

- Completion of the water budget assessment.
- Resolution of the agricultural demand in calibration period.
  - HAT review of methodology and output based on FDACS concern.
  - External review of the approach and agricultural demand data used in the calibration period (IFAS).
- Revise ECFT Model for CFWI use.
  - Modify boundary conditions.
  - Apply correction to bring all vertical data to NAVD88
  - Correct PWS withdrawals.
  - Update agricultural demands if necessary.
  - Implement other minor fixes.

HAT Ongoing / Upcoming Activities (cont.)

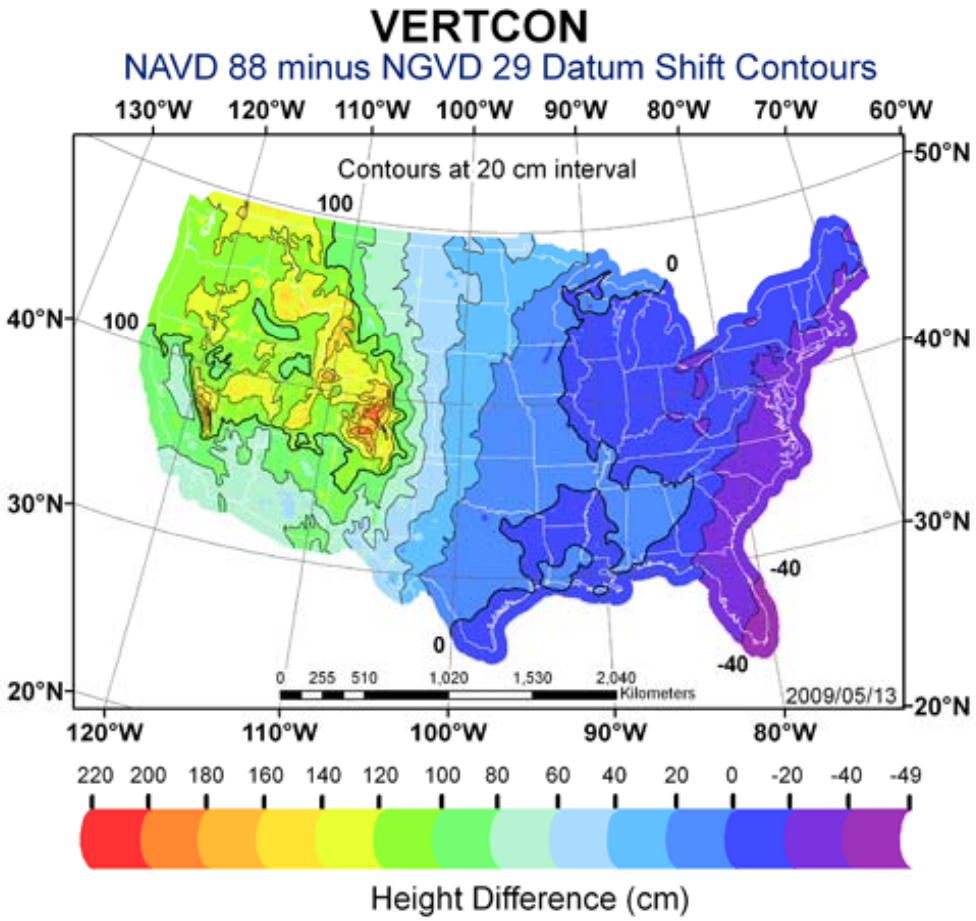
- Re-Calibrate ECFT Model for CFWI use.
- Re-run initial scenarios.
- Finalize 2035 Water Use projections for model input in collaboration with the Water Supply Plan Team and FDACS.
- Run future condition scenarios (EOP & 2035).

Questions?

Backup slides
Use if needed

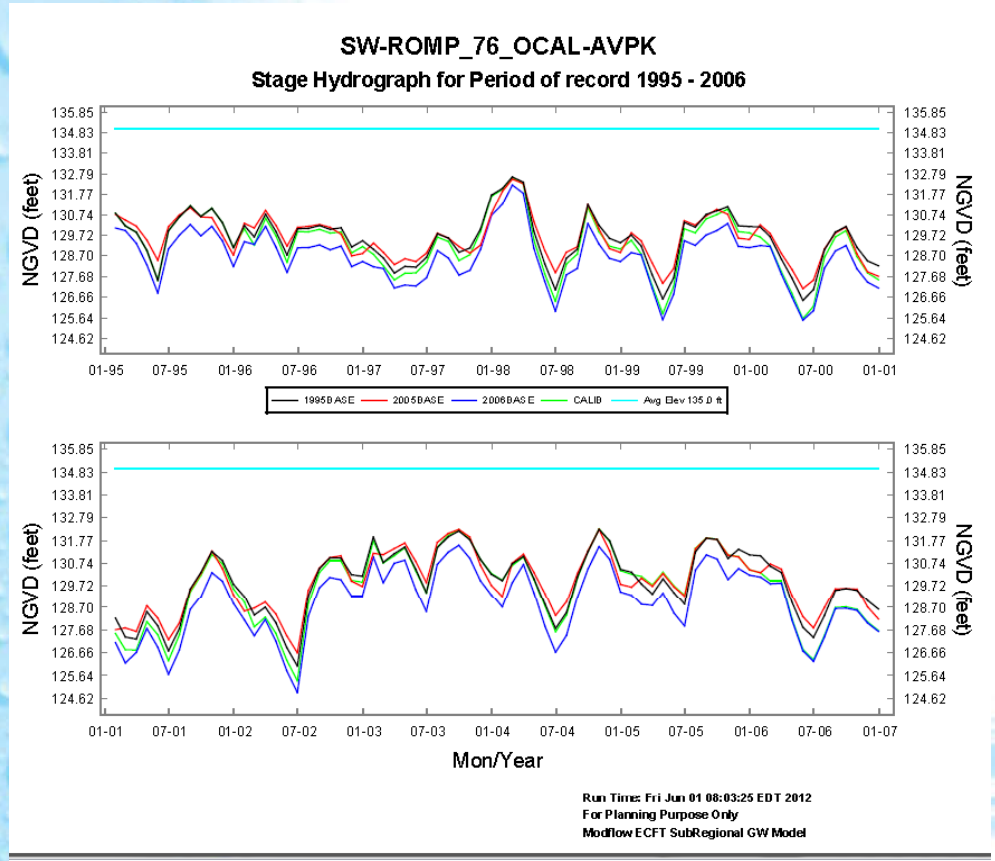
Vertical Datum

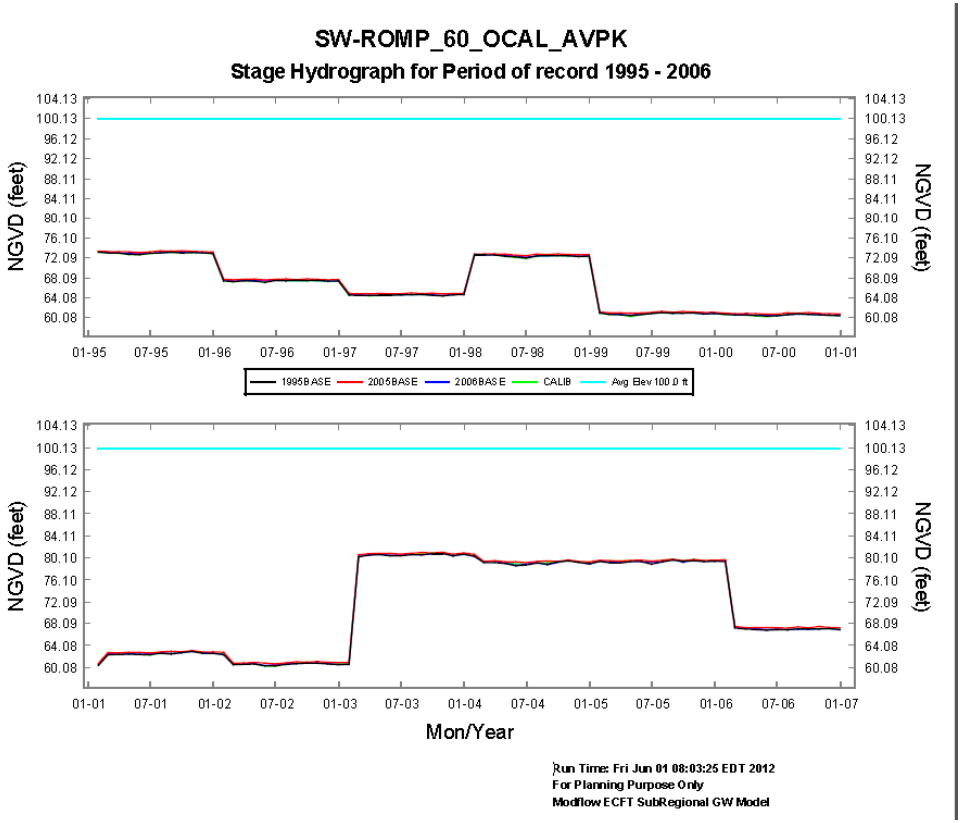
- Model currently contains a mix of data in NGVD29 and NAVD88.
- Difference between the two datum generally range from just below to just above one foot in Central Florida.
- Extent and effect on model results is being examined but is expected to be in the order of a foot and needs to be corrected.



Boundary Condition

- Effect of boundary conditions extend as far as 20 miles into the model domain.
- USGS chose to apply annual varying values for the lateral boundaries of the model.
- HAT convinced monthly varying values more appropriate.
- Stair-stepping response observed at some locations within the model in response to the USGS specified boundaries. This may result in reduced confidence in the models ability to accurately simulate system response.


SW-ROMP_76_OCAL-AVPK
Stage Hydrograph for Period of record 1995 - 2006
NGVD (feet)
135.85
134.83
133.81
132.79
131.77
130.74
129.72
128.70
127.68
126.66
125.64
124.62
01-95
07-95
01-96
07-96
01-97
07-97
01-98
07-98
01-99
07-99
01-00
07-00
01-01
1995BASE
2005BASE
2006BASE
CALIB
Avg Elev 135.0 ft
01-01
07-01
01-02
07-02
01-03
07-03
01-04
07-04
01-05
07-05
01-06
07-06
01-07
Mon/Year
Run Time: Fri Jun 01 08:03:25 EDT 2012
For Planning Purpose Only
Modflow ECFT SubRegional GW Model


SW-ROMP_60_OCAL_AVPK
Stage Hydrograph for Period of record 1995 - 2006
NGVD (feet)
104.13
100.13
96.12
92.12
88.11
84.11
80.10
76.10
72.09
68.09
64.08
60.08
01-95
07-95
01-96
07-96
01-97
07-97
01-98
07-98
01-99
07-99
01-00
07-00
01-01
1995BASE
2005BASE
2006BASE
CALIB
Avg Elev 100.0 ft
01-01
07-01
01-02
07-02
01-03
07-03
01-04
07-04
01-05
07-05
01-06
07-06
01-07
Mon/Year
Run Time: Fri Jun 01 08:03:25 EDT 2012
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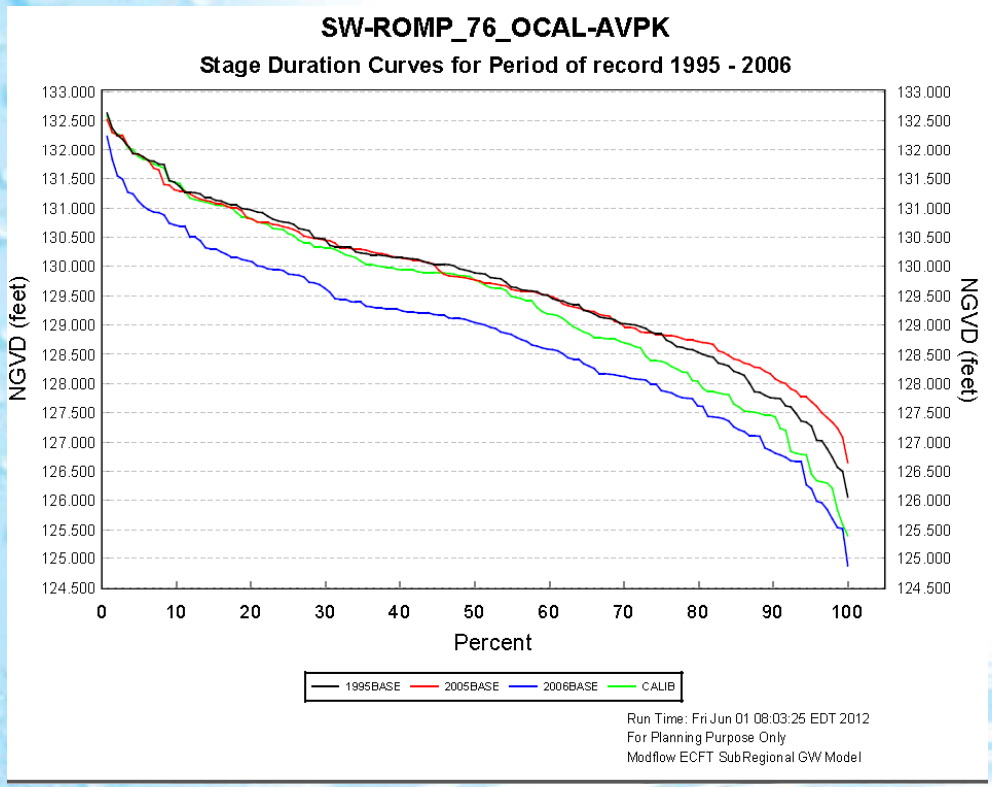
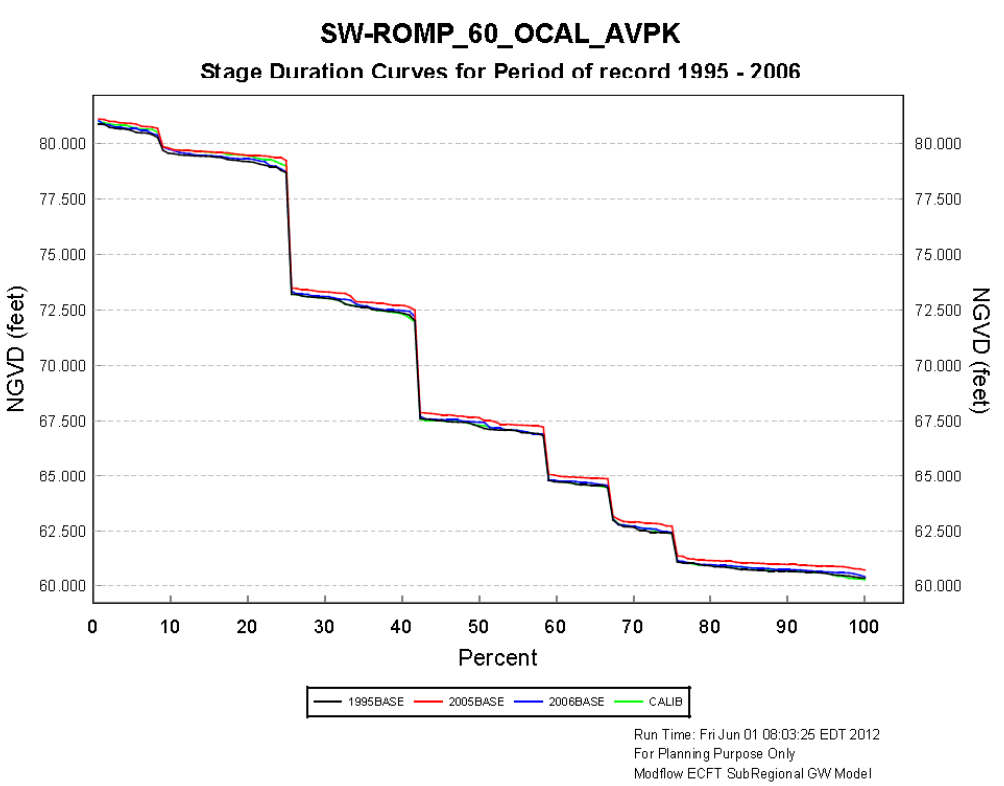
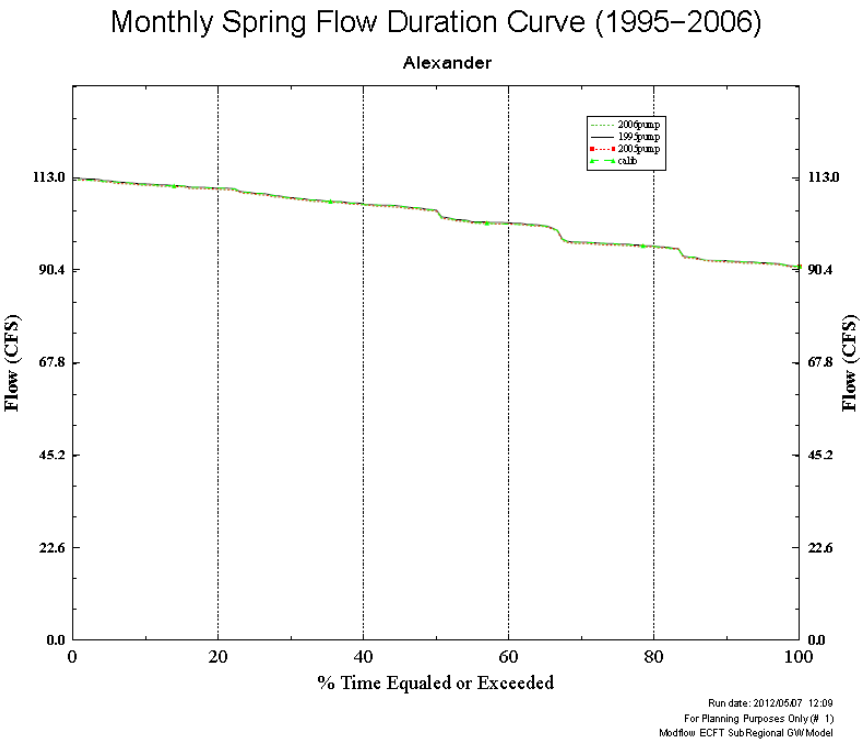
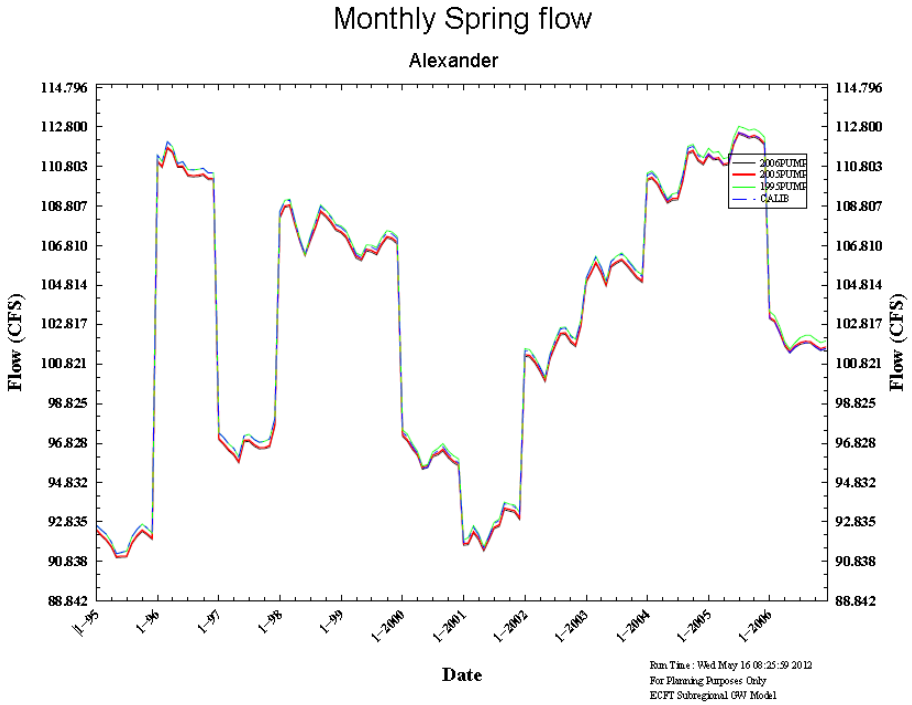

SW-ROMP_76_OCAL-AVPK
Stage Duration Curves for Period of record 1995 - 2006
NGVD (feet)
Percent
1995BASE
2005BASE
2006BASE
CALIB
Run Time: Fri Jun 01 08:03:25 EDT 2012
For Planning Purpose Only
Modflow ECFT SubRegional GW Model


SW-ROMP_60_OCAL_AVPK
Stage Duration Curves for Period of record 1995 - 2006
NGVD (feet)
Percent
1995BASE
2005BASE
2006BASE
CALIB
Run Time: Fri Jun 01 08:03:25 EDT 2012
For Planning Purpose Only
Modflow ECFT SubRegional GW Model


Monthly Spring Flow Duration Curve (1995–2006)
Alexander
2006pump
1995pump
2005pump
calib
113.0
90.4
67.8
45.2
22.6
0.0
Flow (CFS)
0
20
40
60
80
100
% Time Equaled or Exceeded
Run date: 2012/05/07 12:09
For Planning Purposes Only (# 1)
Modflow ECFT SubRegional GW Model


Monthly Spring flow
Alexander
2006SPUMP
2005SPUMP
1995SPUMP
CALIB
114.796
112.800
110.803
108.807
106.810
104.814
102.817
100.821
98.825
96.828
94.832
92.835
90.838
88.842
Flow (CFS)
1–95
1–96
1–97
1–98
1–99
1–2000
1–2001
1–2002
1–2003
1–2004
1–2005
1–2006
Date
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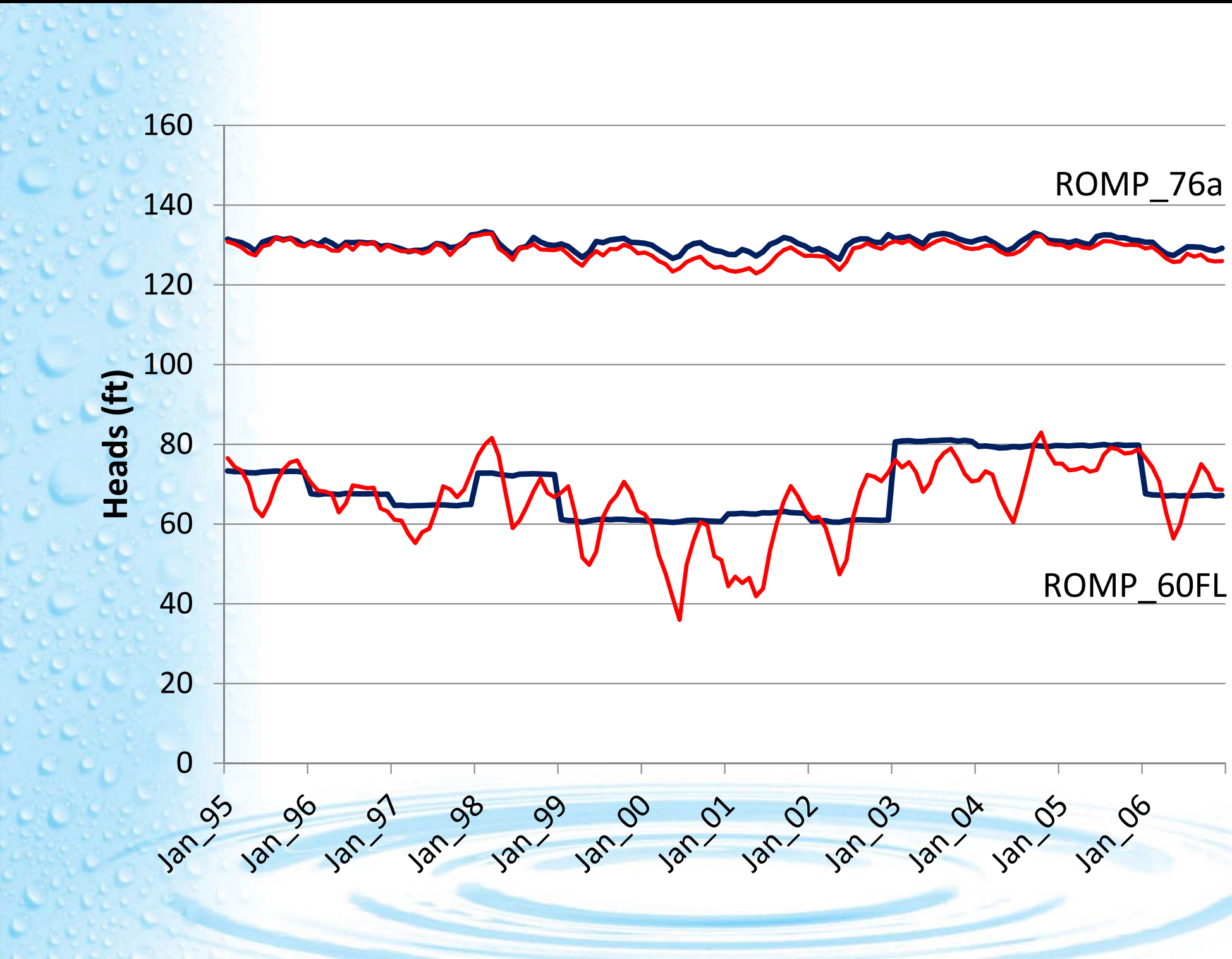
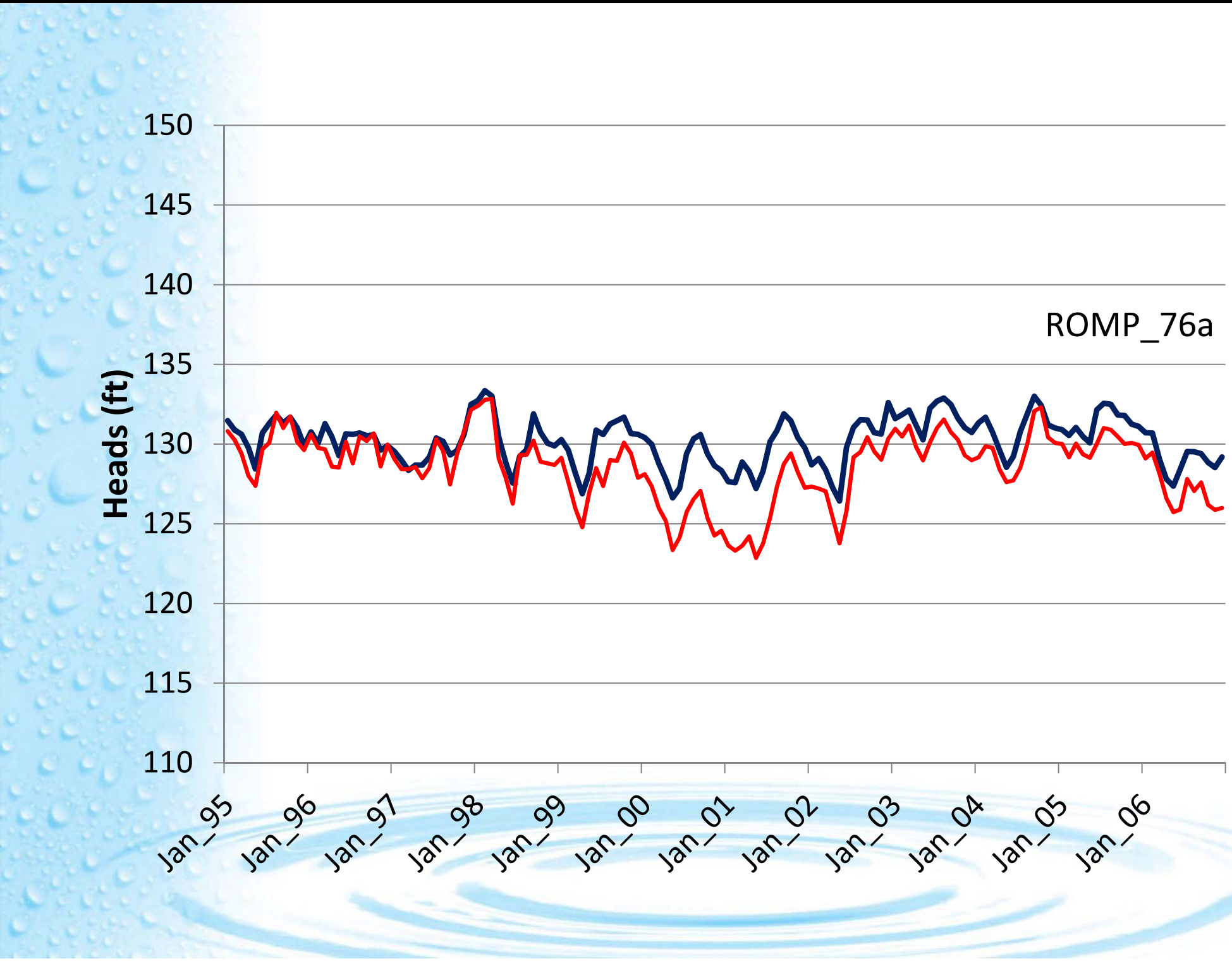
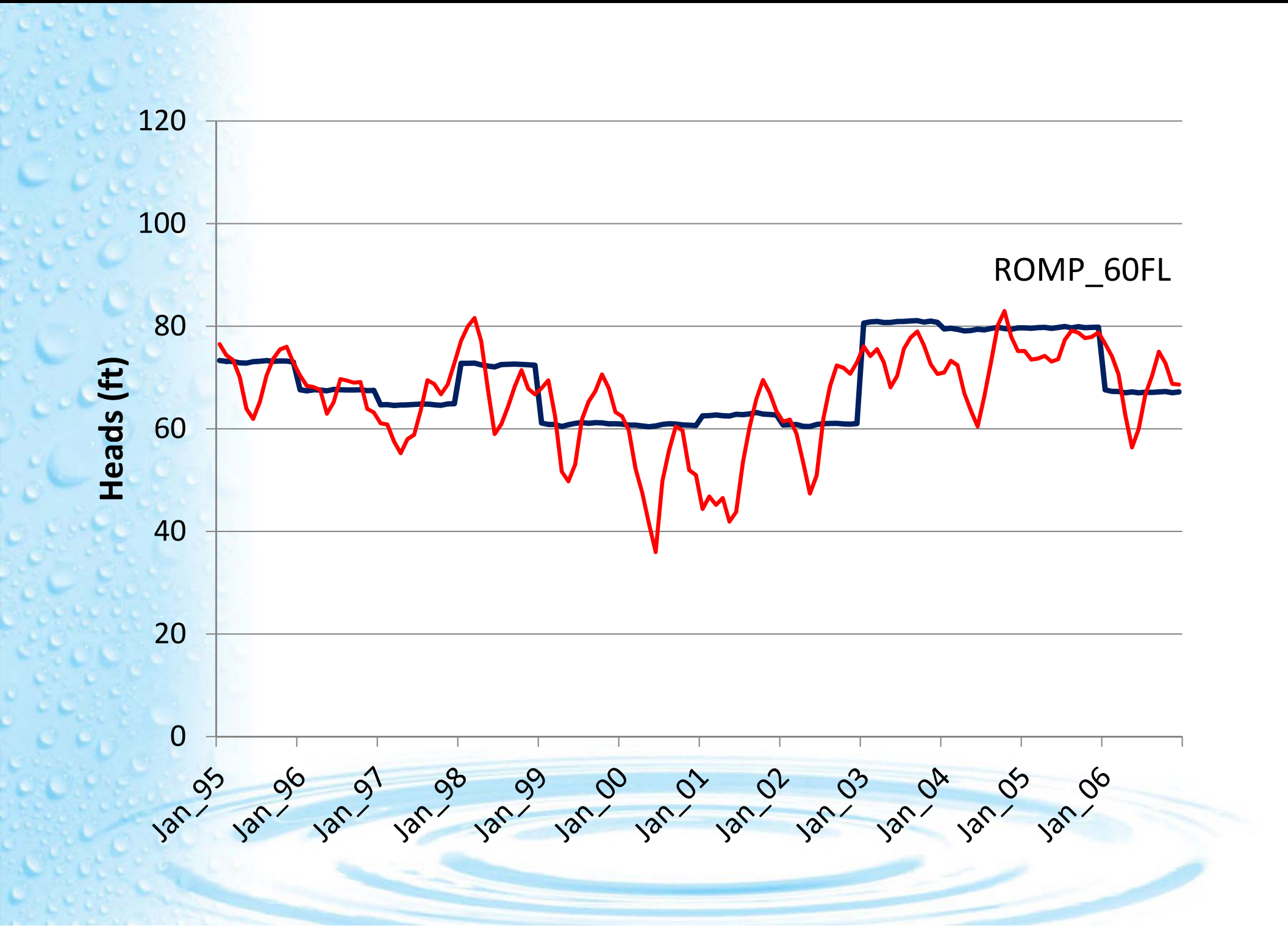
ECFT Subregional GW Model


160
140
120
100
80
60
40
20
0
Heads (ft)
ROMP_76a
ROMP_60FL
Jan_95
Jan_96
Jan_97
Jan_98
Jan_99
Jan_00
Jan_01
Jan_02
Jan_03
Jan_04
Jan_05
Jan_06


ROMP_76a
Heads (ft)
150
145
140
135
130
125
120
115
110
Jan_95
Jan_96
Jan_97
Jan_98
Jan_99
Jan_00
Jan_01
Jan_02
Jan_03
Jan_04
Jan_05
Jan_06


ROMP_60FL
Heads (ft)
120
100
80
60
40
20
0
Jan_95
Jan_96
Jan_97
Jan_98
Jan_99
Jan_00
Jan_01
Jan_02
Jan_03
Jan_04
Jan_05
Jan_06