

SOUTH DELTA WATER AGENCY

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January 29, 2009

Via E-Mail commentletters@waterboards.ca.gov

Ms. Jeanine Townsend, Clerk to the Board
Executive Office
State Water Resources Control Board
Cal/EPA Headquarters
1001 "T" Street, 24th Floor
Sacramento, CA 95814-2828

Re: Comment Letter - 02/03/09 Board Meeting
JPOD Petitions for Reconsideration Draft Order

Dear Ms. Townsend:

The South Delta Water Agency ("SDWA") submits the following comments to the SWRCB's Draft Order Denying Petitions for Reconsideration.

Introduction.

The SWRCB has unfortunately taken the position of advocate rather than judge. Its actions to date, including the granting of the original Urgency Petition and this Draft Order show an embarrassingly blatant bias to favor export interests over the Board's statutory obligation to regulate and protect beneficial uses dependent upon water quality. Rather than reconsidering the grounds upon which the of the Draft Order was based, the Board *argues* in the Draft Order to justify its prior approval of the Urgency Petition.

The Board now does not just endorse exports at the expense of other users of Delta waters, but has actually created a process whereby the incompetent and indifferent can simply ignore permit conditions, water right orders and cease and desist orders. Under the Board's remarkable reasoning in the Draft Order, the projects can simply choose to take no action to

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meet their obligations, wait until the last minute, and then be granted an "urgency" change to their permits outside of the any public process. The evil genius of this new system lies in the Board's ability to shelve any public outcry or attempt to oppose the violations of permits and objectives by simply deciding to take no action until the temporary urgency changes expire.

One can only speculate as to why the regulator of water quality in the State chooses to ignore its own water quality standards, its own water right orders and its own cease and desist orders; especially when it has been shown how the permit holders can indeed meet their obligations without any real loss of water. The Draft Order exemplifies the underlying causes of the current water related problems facing the State of California. Those causes are fishery and water quality/right regulators refusing to force the projects to abide by the rules. If the SWRCB, DFG, and indeed DWR had abided by their statutory obligations, the past twenty five years could have been spent finding alternate supplies of water while export interests adjusted to the actual supply available to them. Instead, exports became "entitled" to a supply that did not exist with the resulting destruction of the Delta fisheries and the now casual acceptance of water quality violations.

Mootness

The Board begins its analysis of the Requests for Reconsideration by noting that the issues are moot. It then states that it will go forward with an analysis because some of the issues raised involve "continuing public interest" and that some of these issues may reoccur. This two prong obfuscation begs comment.

First, the reason the issues are now moot (according to the Board) is that the temporary changes have expired. Such changes being granted for 180 days, the original Order being granted on June 26, 2008, the changes expired on or about December 28, 2008. SDWA filed its Request for Reconsideration on July 18, 2008. The Board released its Draft Order on January 6, 2009. This means that the Board waited until 9 days AFTER the changes expired to address the Requests for Reconsideration, or 158 days after the Requests for Reconsideration were filed.

Although the Urgency Petition was handled in a timely, one might say an expedited manner (i.e. without public notice), the attempts to get review of the approval were given no consideration until *just* after the approval expired. Not much needs to be said about a process which consciously favors one side while precluding the other. It will be an interesting legal argument before the courts to see if an agency can legally create "mootness" to avoid review.

Second, the Board's decision to recount its reasoning due to "continuing public interest" provides a blueprint for future cheating. The Draft Order informs USBR and DWR that if the drought persists, they need take no actions to meet their water quality obligations. If they again

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wait until the last minute to seek these "urgency" changes, they will be granted regardless of anything they have done or not done. The Board's Draft Order rewards, if not institutionalizes project indifference and lethargy.

Finding of Urgency.

The Requests for Reconsideration argued that since the DWR and USBR had not been diligent in petitioning for their changes through the normal temporary change process, they could not be granted an "urgency" change. Water Code Section 1435 (c) defines "urgent" but then states that "the board *shall not* find a petitioner's need to be urgent if the board in its judgment concludes, if applicable, that the petitioner has not exercised diligence" in seeking the changes under the normal process for seeking changes to permits (emphasis added).

The Draft Order concludes that "the ultimate issue is whether there is an urgent need, and the State Board may exercise its judgment to conclude that an urgent need exists without finding that the petitioner has exercised due diligence" (Draft Order, FN 4, page 11). This reasoning harkens back to grammar schools days and the "I know you are but what am I?" method of rhetoric.

First, the Board's position makes subsection (c) meaningless. It somehow detaches the statutory definition of "urgent" from a finding of urgency. The Board hangs its hat (or more correctly itself) on the clause "if applicable" to allow itself to ignore the diligence requirement. This clause cannot mean that the Board can choose to ignore diligence, it clearly means that diligence may not apply, as in the case where something unanticipated occurs and the opportunity to seek a change to a permit could not be concluded under normal petition processes. That is to say, the Board need not deliberate on whether the petitioner was diligent if diligence was not germane to the facts. This is the exact opposite of the current situation. Here, not only were the petitioners on notice as of the date of the CDO (2006) that they had to meet water quality standards as a condition to JPOD (the issue was directly ruled on in the CDO), but they had received a letter from the Board's Executive Director telling them to be diligent if this is what they wanted to do! To separate diligence from urgency in this case is to ignore the English language.

Second, the purpose of the statute is eviscerated by the Board's reasoning. Clearly the diligence portion of the statute is to make sure that a permittee does not wait until the last minute to seek a change *because the urgency provisions are an expedited process without public notice or hearing!* The statute, especially the portion dealing with diligence attempts to make sure permittees attempt to work within their permit conditions, and the public, open method by which changes can be granted. The Board institutes the exact opposite situation now; a permittee can do nothing, wait until the last minute and then get an expedited change without having shown it

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tried to work within its permit conditions or normal change procedures.

This case is the perfect example. DWR and USBR violated their permits for maintaining water quality all of summer 2007, and additionally violated their permit for JPOD by pumping during such violations. If they had petitioned to change their permits in a timely manner to avoid further illegal actions in 2008, we could have had a hearing. The hearing would have shown that the CDO already addressed the issue, thus the petition was a "too late" attempt to appeal the CDO. It would have also shown that DWR and USBR were simply not trying to implement actions which would result in compliance with the standards. Instead, they avoided taking any action, waited until the last minute and then avoided any review or opposition. If this is the situation the Board encourages, it should petition the Legislature to change Section 1435, not simply interpret its provisions away.

The Board attempts to justify its position by harping on the Governor's declaration of emergency. That is in fact, irrelevant. The drought, the need for water, and the desire to expedite transfers did not create an urgency for DWR and USBR to be released from their permit conditions. First, there is no reason why they could not take actions to meet their obligations and still expedite transfers. Second, and more importantly, DWR, USBR and SWRCB knew in 2007 that the projects weren't going to even try to meet their water quality obligations (because they didn't in 2007) but that they still wanted to do JPOD. Hence the need to secure a change to their permits (and an illegal appeal of D-1641 and the CDO) arose at the latest as of the date of the Executive Director's letter in late 2007. Thus, no mangling of logic or facts can result in the emergency arising in June of 2008 or that a last minute petition is urgent. It wasn't urgent, it was intentionally late.

The SWRCB is required under the statute to make sure that urgency petitions are not used as a way to avoid the normal public process, and therefore when a petitioner clearly knew it had to seek a change in its permits a year before, it cannot wait until the last minute and escape through an urgency petition.

Methods by Which DWR and USBR Can Meet the Standards.

As previously stated and presented, SDWA and DWR modelers have concluded that slight (one foot) elevations changes in the heights of some of the temporary barriers, in combination with a recirculation project to maintain certain San Joaquin River flows will result in net flows in Old River and Middle River which are believed to be sufficient to result in compliance with the Middle River at Old River and Tracy Blvd. Bridge at Old River standards (or more correctly the compliance monitoring stations at those locations) (see attachment). The third interior station at Brandt Bridge on the San Joaquin River is anticipated to also be met through reverse flows on that channel under these same operating conditions. Hence, there

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appears to be a method by which the projects can meet their permit terms, and thus not act illegally or need to seek last minute changes to their permits.

Besides being of great interest to the Board (in its never ending quest for compliance with permit terms and conditions) this is directly relevant to the Draft Order. SDWA previously submitted this information to the Board before the Order was issued. That information was sufficient to indicate that DWR and USBR had not been diligent in their efforts to meet their permit conditions, and was directly contrary to the Executive Director's findings. As per SDWA's previous comments, the Draft Order inappropriately shifted the burden of making these findings to the Executive Director, rather than making them in the Order. By "allowing" the Executive Director to evaluate what could or could not be done six days before the JPOD was scheduled to begin, the Board again created the situation in which three years of lack of effort (the time between D-1641's activation of the full standards in 2005 and the DWR and USBR's Urgent inability to meet the standards) could be ignored. As a matter of law, the projects failure to even try to meet the standards precludes a finding or "urgency" for purposes of Section 1435.

Water Quality Violations

The most important aspect of the Draft Order is its implications regarding water quality. The SWRCB now casually condones the yearly violations of the standards in summer.¹ D-1641 assigned the standards to the projects, and to no one else; the CDO clarified DWR and USBR were solely responsible for the standards and no one else and that JPOD could only occur if the standards were met. Violations of both of these are now common, yet no action is taken. No action. The Draft Order seems to suggest that enforcement of water quality standards is irrelevant depending on export needs, and that it will allow both unlawful actions and will clandestinely approve the unlawful.

There appears to be no apparent reason for this attitude. However the laws of probability suggest that the Board and its staff cannot *all* be predisposed to ignore existing standards or feel obligated to abet cheating by the projects. Hence, these comments are an appeal to the majority of the Board and its staff to begin ignoring the tainted advice and arguments of those who support the violations, who support no enforcement, and who support giving the exporters advice on how to avoid their responsibilities. There is still time and hope for the Board begin to do its job.

Other.

¹ Besides the summer violations, DWR and USBR notified the Board that violations were occurring in December of 2008. At this time SDWA is not aware that those violations have ceased.]

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With regard to the necessity of CEQA, SDWA refers the Board to page 26 of the CDO (WR 2006-0006) wherein the Board states:

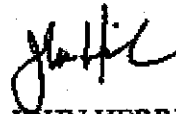
"However, (a permit change allowing JPOD when water quality standards are being violated) would require compliance with the California Environmental Quality Act. ... Since no environmental document that analyzes the effects on Condition 1 of the WQCP approval is in the hearing record, the State Water Board will require that DWR and USBR meet the objectives whenever they conduct JPOD operations."

SDWA's previous comments adequately address the other issues raised in its Request for Reconsideration.

SDWA request the SWRCB discard the Draft Order, acknowledge that the original Order was unsupported by the facts and contrary to law, confirm that DWR and USBR must meet all of their permit conditions, and confirm that JPOD can only occur during such times of compliance.

Please call me if you have any questions or comments.

Very truly yours,



JOHN HERRICK

JH/dd
Attachment

PRELIMINARY RESULTS, SUBJECT TO REVISIONS

South Delta Alternatives Analysis Study Using DSM2 Simulations

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Operations Control Office
Division of Operations & Maintenance

December 17, 2008

South Delta Alternatives Analysis Study Using DSM2 Simulations

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South Delta Alternatives Analysis Study Using DSM2 Simulations

Approach:

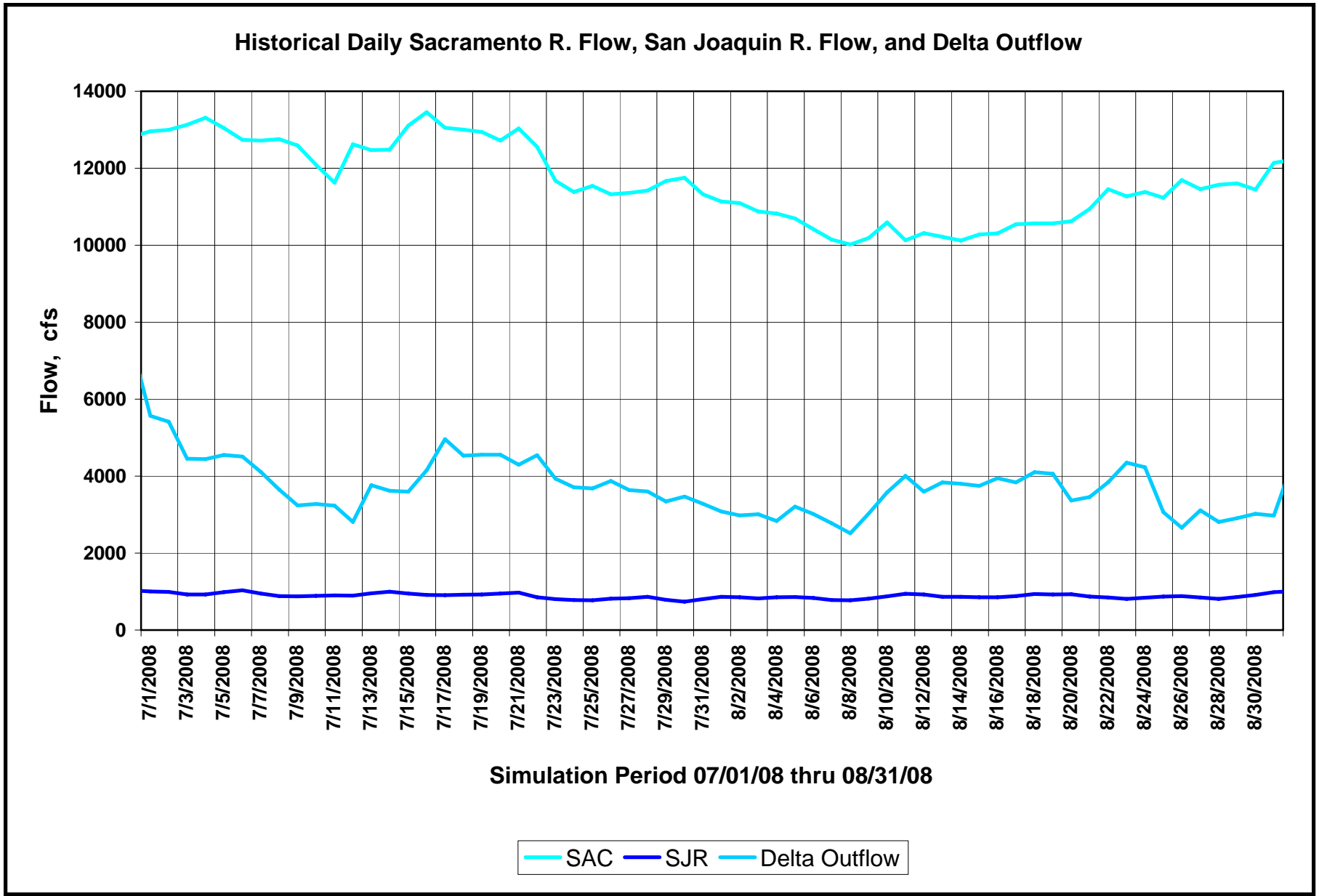
1. Develop a baseline run using July 1- August 31, 2008 historical data.
2. Refine the baseline by comparing with observed data (stage and flow) and by modifying south delta barrier characteristics if necessary.
3. Formulate alternative scenarios with elevation changes among barriers, with increased number of culverts in the barriers, etc.; and simulate these scenarios and evaluate results.
4. Formulate alternative scenarios with various levels of pumping from San Joaquin River to Paradise Cut assuming elevated initial EC levels in Paradise Cut; simulate these scenarios and evaluate results.

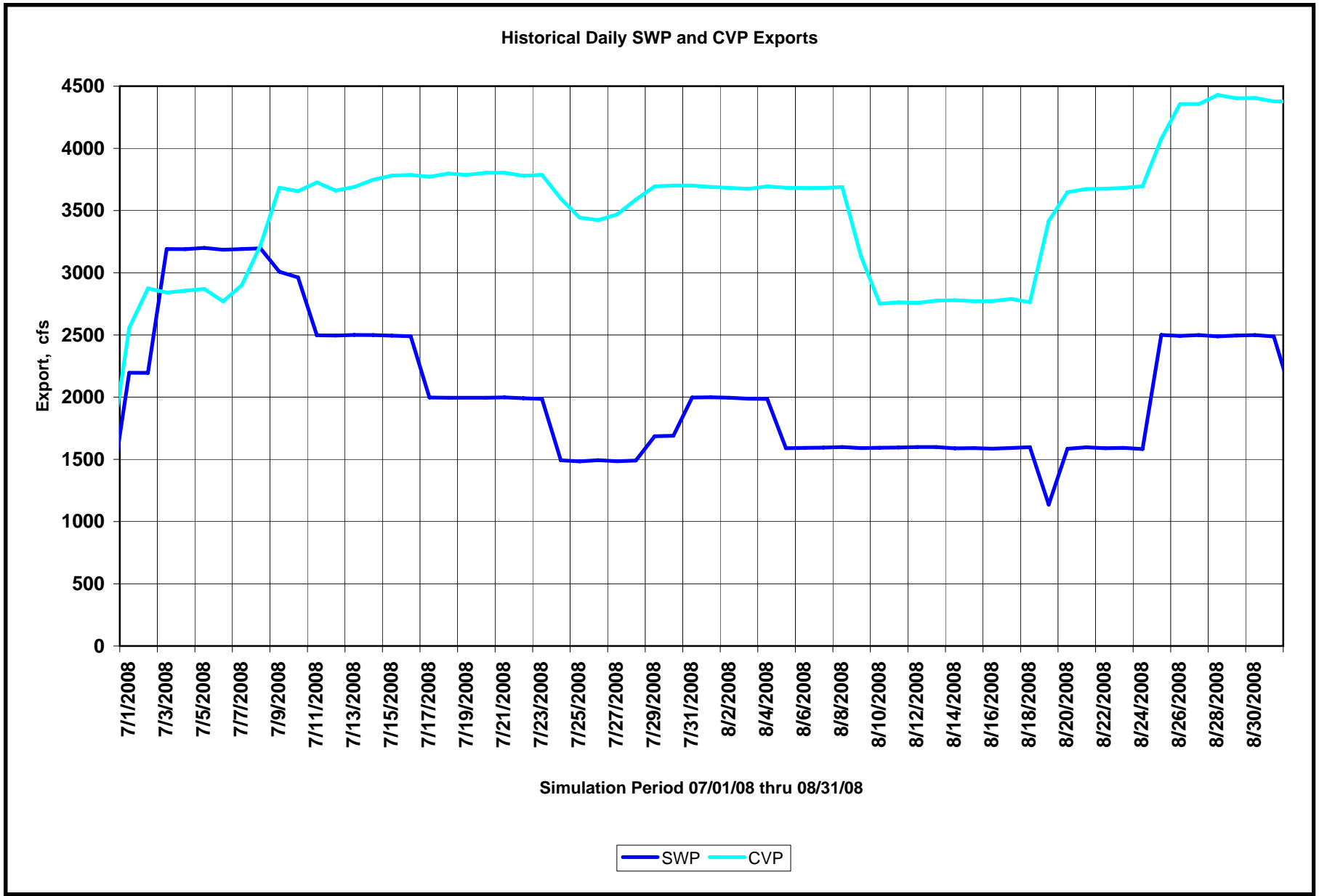
SUMMARY OF GATES OPERATIONS, FLOWS & EXPORTS

Summary of Gates Operations, Flows, and Exports

(July 1, 2008 – August 31, 2008)

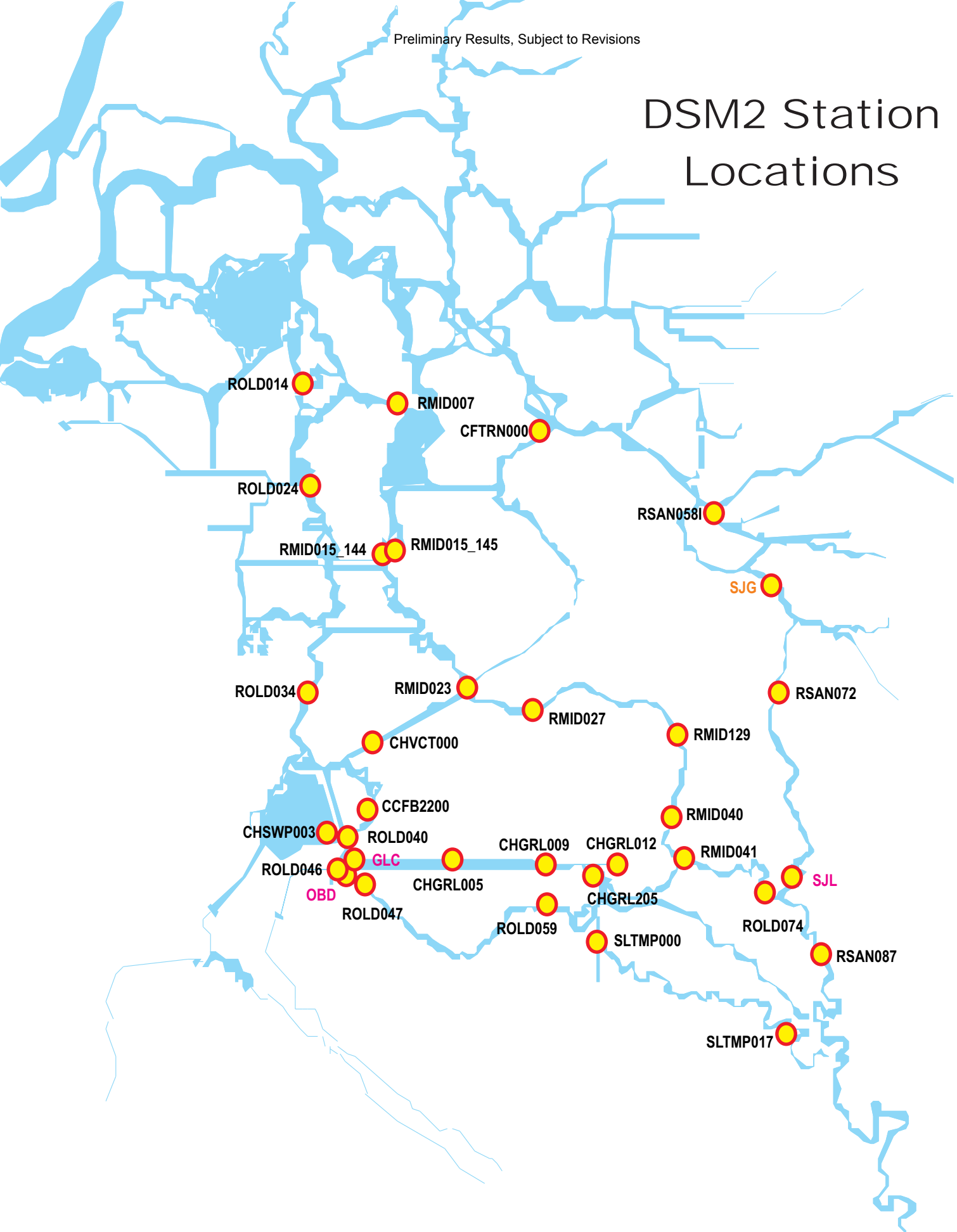
1. **Clifton Court Forebay Gates** were operating on a Priority 2 schedule from the beginning to the end of the period.
2. **Delta Cross Channel Gates** remained open from the beginning to the end of the period.
3. All three **agricultural barriers** were in place and were operating as follows
 - **MR Flapgates:**
 - 7/1/08 – 8/31/08: All six MR flapgates untied (operating tidally).
 - **ORT Flapgates:**
 - 7/1/08 - 7/8/08: All nine ORT flapgates tied open.
 - 7/9/08 - 8/3/08: Six of nine ORT flapgates untied (operating tidally) and three tied open.
 - 8/4/08 - 8/5/08: Three of nine ORT flapgates untied (operating tidally) and six tied open.
 - 8/6/08 - 8/13/08: Six of nine ORT flapgates untied (operating tidally) and three tied open.
 - 8/14/08 - 8/31/08: Three of nine ORT flapgates untied (operating tidally) and six tied open.
 - **GLC Flapgates:**
 - 7/1/08 - 7/28/08: All six GLC flapgates tied open.
 - 7/29/08 - 8/31/08: All six GLC flapgates untied (operating tidally).
4. Suisun Marsh salinity control flashboards were removed and the boatlock was closed. The Suisun Marsh salinity control gates were open from the beginning to the end of the period.
5. San Joaquin River flow at Vernalis varied between 750 cfs and 1,050 cfs over the period.
6. Sacramento River flow at Freeport varied between 10,000 cfs and 13,500 cfs over the period.
7. Clifton Court Forebay intake varied between 1,100 cfs and 3,200 cfs over the period.
8. Jones pumping varied between 2,500 cfs and 4,400 cfs over the period.



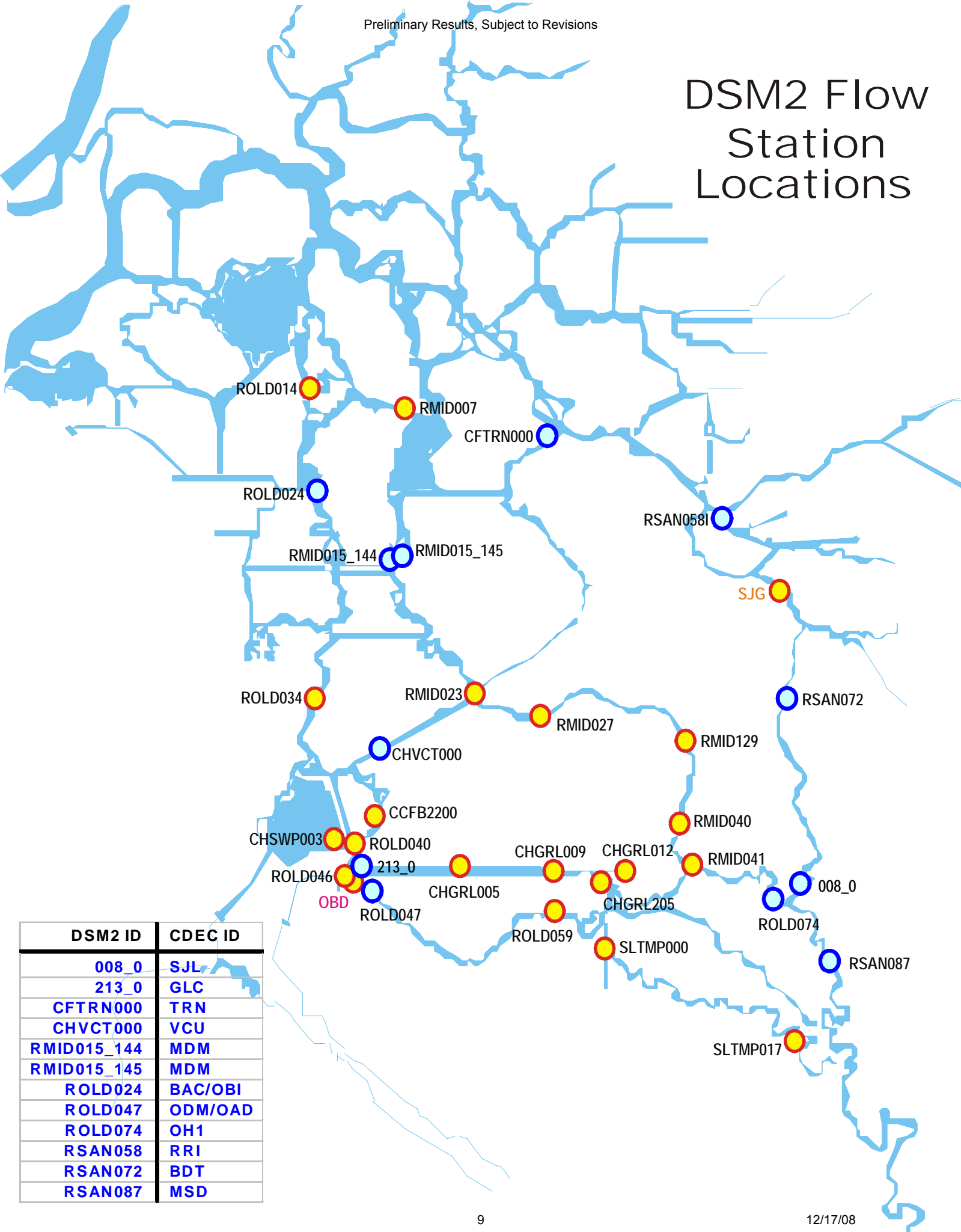


DSM2 LOCATIONS MAPS & TABLE

DSM2 Station Locations



DSM2 Flow Station Locations



| DSM2 ID | CDEC ID |
|-------------|---------|
| 008_0 | SJL |
| 213_0 | GLC |
| CFTRN000 | TRN |
| CHVCT000 | VCU |
| RMID015_144 | MDM |
| RMID015_145 | MDM |
| ROLD024 | BAC/OBI |
| ROLD047 | ODM/OAD |
| ROLD074 | OH1 |
| RSAN058 | RRI |
| RSAN072 | BDT |
| RSAN087 | MSD |

DSM2 LOCATIONS FOR SOUTH DELTA ALTERNATIVES ANALYSIS

| Sl. No | DSM2 ID | DSM2 Channel (Length) | DSM2 Node | Data Definition | CDEC Name | Stage | (CDEC Sensor) /Time Resol. | Flow | (CDEC Sensor) /Time Resol. | EC | (CDEC Sensor) /Time Resol. | Comments |
|---------------------|-------------|-----------------------|-----------|---|-----------|-------|----------------------------|------|----------------------------|-----|----------------------------|---|
| MIDDLE RIVER | | | | | | | | | | | | |
| 1 | RMID007 | Channel 248 (665) | | Middle R. | | | | | | | | |
| 2 | RMID015_144 | Channel 144 (838) | | Middle R. near Middle R. | USGS/MDM | Yes | (1) 15M | Yes | (20/41) 15M/1D | No | N/A | Calc = 144 minus 145 |
| 3 | RMID015_145 | Channel 145 (214) | | Middle R. near Middle R. | USGS/MDM | Yes | (1) 15M | Yes | (20/41) 15M/1D | No | N/A | Calc = 144 minus 145 |
| 4 | CHVCT000 | Channel 229 (0) | Node 190 | Victoria Canal near Byron | VCU | Yes | (1) 15M | Yes | (20) 15M | Yes | (100) 15M | Need mean daily flow and daily EC. |
| 5 | RMID023 | Channel 135 (719) | | Middle R. @ Borden Highway. VIC=Victoria Island. | VIC | No | N/A | No | N/A | Yes | (5) 15M/1H/1D | |
| 6 | 134_length | Channel 134 (length) | | Middle R. Barrier (downstream) | N/A | | | | | | | |
| 7 | RMID027 | Channel 133 (3641) | | Middle R. @ Tracy Blvd. | MTB | Yes | (1) 15M | No | N/A | Yes | (100) 15M/1H/1D | |
| 8 | 133_0 | Channel 133 (0) | | Middle R. Barrier (upstream) | N/A | | | | | | | |
| 9 | RMID129 | Channel 129 (3000) | | Middle R. @ Howard Road Bridge | MHR | Yes | (1) 15M | No | N/A | Yes | (100) 15M | Need daily EC. |
| 10 | RMID040 | Channel 126 (3951) | | Middle R. @ Mowery Bridge | N/A | | | | | | | |
| 11 | RMID041 | Channel 125 (1700) | | Middle R. @ Old R. (Middle R. East of Union Island) | UNI | No | N/A | No | N/A | Yes | (5) 15M/1H/1D | |
| OLD RIVER | | | | | | | | | | | | |
| 12 | ROLD014 | Channel 118 (0) | | Old R. @ Holland Cut | HLL | No | N/A | No | N/A | Yes | (5) 15M/1H/1D | |
| 13 | ROLD024 | Channel 106 (2718) | | Old R. @ Bacon Island (near CCC) | USGS/BAC | Yes | (1) 15M | Yes | USGS | Yes | (100) 15M/1H/1D | BAC doesn't have flow data. |
| 14 | ROLD024 | Channel 106 (2718) | | Old R. @ Bacon Island (near CCC) | USGS/OBI | Yes | (1) 15M | Yes | (20/41) 15M/1D | Yes | (100) 15M | Need daily EC. |
| 15 | ROLD034 | Channel 90 (3021) | | Old R. near Byron | ORB | Yes | (1) 15M | No | N/A | No | N/A | |
| 16 | CCFB2200 | Channel 218 (2200) | | West of Union Island (Old R. @ Coney Island) | CIS | Yes | (1) 15M | No | N/A | No | N/A | No data although CDEC has sensors for EC. |
| 17 | CHSWP003 | Channel 82 (length) | | Clifton Court Forebay (Gates) | CLC | No | N/A | No | N/A | Yes | (100) 15M/1D | |
| 18 | ROLD040 | Channel 82 (2609) | | Old R. @ Clifton Court Ferry | N/A | | | | | | | |
| 19 | 80_length | Channel 80 (length) | | Old R. Barrier (downstream) | N/A | | | | | | | |
| 20 | ROLD046 | Channel 80 (1431) | | Old R. | N/A | | | | | | | |
| 21 | ROLD047 ?? | Channel 79 (2766) ?? | | Old R. near DMC below Dam | OBD | Yes | (1) 15M | No | N/A | Yes | (100) 15M | Need daily EC. |
| 22 | ROLD047 ?? | Channel 79 (2766) ?? | | Old R. near DMC | ODM | Yes | (1) 15M | Yes | (20) 15M | No | N/A | Need mean daily flow. |
| 23 | ROLD047 ?? | Channel 79 (2766) ?? | | Old R. near DMC above Dam | OAD | Yes | (1) 15M | No | N/A | Yes | (100) 15M | Need daily EC. |
| 24 | 79_0 | Channel 79 (0) | | Old R. Barrier (upstream) | N/A | | | | | | | |
| 25 | ROLD059 | Channel 71 (3116) | | Old R. @ Tracy Road | OLD | Yes | (1) 15M | No | N/A | Yes | (100) 15M/1D | |
| 26 | ROLD074 | Channel 54 (735) | | Old R. @ Head | OH1 | Yes | (1) 15M | Yes | (20/41) 15M/1D | No | N/A | |

DSM2 LOCATIONS FOR SOUTH DELTA ALTERNATIVES ANALYSIS

| SI. No | DSM2 ID | DSM2 Channel (Length) | DSM2 Node | Data Definition | CDEC Name | Stage | (CDEC Sensor) /Time Resol. | Flow | (CDEC Sensor) /Time Resol. | EC | (CDEC Sensor) /Time Resol. | Comments |
|--------------------------|------------|-----------------------|-----------|---|-----------|-------|----------------------------|------|----------------------------|-----|----------------------------|------------------------------------|
| TOM PAINE SLOUGH | | | | | | | | | | | | |
| 27 | SLTMP000 | Channel 194 (1946) | | Tom Paine Slough Intake (above intake structure???) | TPI | Yes | (1) 15M | No | N/A | No | N/A | |
| 28 | SLTMP017 | Channel 185 (0) | | Tom Paine Slough (above the mouth???) | TPS | Yes | (1) 15M | No | N/A | No | N/A | |
| PARADISE CUT | | | | | | | | | | | | |
| 29 | 61_length | Channel 61 (length) | | Old R. downstream of Paradise Cut Channel 61 Downstream | N/A | | | | | | | |
| 30 | 61_0 | Channel 61 (0) | | Old R. downstream of Paradise Cut = Channel 61 Upstream | N/A | | | | | | | |
| 31 | 199_0 | Channel 199 (0) | | Paradise Cut Channel 199 Upstream | N/A | | | | | | | |
| 32 | 198_length | Channel 198 (length) | | Paradise Cut Channel 198 Downstream | N/A | | | | | | | |
| 33 | 198_0 | Channel 198 (0) | | Paradise Cut Channel 198 Upstream | N/A | | | | | | | |
| 34 | 197_0 | Channel 197 (0) | | Paradise Cut Channel 197 Upstream | N/A | | | | | | | |
| 35 | 196_0 | Channel 196 (0) | | Paradise Cut Channel 196 Upstream | N/A | | | | | | | |
| 36 | 195_0 | Channel 195 (0) | | Paradise Cut Channel 195 Upstream | N/A | | | | | | | |
| GRANTLINE CANAL | | | | | | | | | | | | |
| 37 | 213_0 | Channel 213 (0) | | Downstream end of Grantline Canal | GLC | Yes | (1) 15M | Yes | (20) 15M | Yes | (100) 15M | Need mean daily flow and daily EC. |
| 38 | CHGRL005 | Channel 211 (1585) | | Grantline Canal (West Position) | N/A | | | | | | | OR IS IT Channel 210 (Length)??? |
| 39 | 207_length | Channel 207 (length) | | Grantline Canal Barrier (downstream) | N/A | | | | | | | |
| 40 | CHGRL009DS | Channel 207 (36) | | Grantline Canal downstream of Barrier (East Position). GCT=GLC at Tarcy Rd Brdige | GCT | Yes | (1) 15M | No | N/A | Yes | (100) 15M | Need daily EC. |
| 41 | 206_0 | Channel 206 (0) | | Grantline Canal Barrier (upstream) | N/A | | | | | | | |
| 42 | CHGRL012 | Channel 204 (1672) | | Head of Grantline Canal | N/A | | | | | | | |
| 43 | CHGRL205 | Channel 205 (3000) | | Doughty Cut above Grantline Canal | DGL | Yes | (1) 15M | No | N/A | Yes | (100) 15M/1D | |
| SAN JOAQUIN RIVER | | | | | | | | | | | | |
| 44 | CFTRN000 | Channel 172 (727) | | Turner Cut near holt (downstream of 172) | TRN | Yes | (1) 15M | Yes | (20) 15M | Yes | (100) 15M | Need mean daily flow and daily EC. |
| 45 | RSAN058 | Channel 20 (2520) | | San Joaquin R. @ Stockton Ship Channel/Rough & Ready island | RRI | Yes | (1) 15M | Yes | (20) 15M | Yes | (100) 15M/1D | Need mean daily flow. |
| 46 | RSAN072 | Channel 10 (9400) | | San Joaquin R. @ Brandt Bridge | BDT | Yes | (1) 15M | Yes | (20) 15M | Yes | (100) 15M/1D | Need mean daily flow. |
| 47 | 8_0 | Channel 8 (0) | | San Joaquin R. below Head of Old R. near Lathrop | SJL | Yes | (1) 15M | Yes | (20/41) 15M/1D | Yes | (100) 15M | Need daily EC. |
| 48 | RSAN087 | Channel 6 (3930) | | San Joaquin R. @ Mossdale | MSD | Yes | (1) 15M | Yes | (20) 15M | Yes | (100) 15M/1D | Need mean daily flow. |

SUMMARY OF RESULTS

South Delta Alternatives Analysis Study Using DSM2 Simulations

Summary of Results from Analysis:

A. Simulation of Historical Water Level and Flow Conditions

DSM2 is able to reasonably accurately simulate historical water level and water flow conditions in the Delta for the period July 1 through August 31.

B. Impacts of Changes in Barrier Operations (Scenarios F, G, H, and I)

| Scenario | Change in Barrier Operations | Impacts of Barrier Operations on Period Average Flow (CFS) as Compared to | | |
|----------|-------------------------------|---|--------------|------------------|
| | | Old River at Tracy | Middle River | Grant Line Canal |
| F | ORT Elv -0.5'; GLC Elv +0.5' | +25 | + 10 | -90 |
| H | "F" + MR Elv +0.5 & npipes 8 | +30 | -15 | -85 |
| G | ORT Elv -1.0'; GLC Elv +1.0' | +80 | + 5 | -150 |
| I | "G" + MR Elv +1.0 & npipes 10 | +95 | -50 | -140 |

C. Impacts of Pumping from San Joaquin River to Paradise Cut

1. The decrease in flow (10 to 20 cfs) in San Joaquin River due to pumping into Paradise Cut results in a similar decrease in flow at Old River at Head, as well as in channels of Old River upstream of Old River-Paradise Cut junction.
2. Downstream of Paradise Cut, the flow in Old River is about the same for the various alternative levels of pumping from San Joaquin River to Paradise Cut. This happens because due to pumping, there is a decrease in flow from San Joaquin River and there is a similar increase in flow from Paradise Cut.
3. The initial elevated EC values (3,000 mmhos/cm) in the channels of Paradise Cut decrease to 500-600 mmhos/cm within two weeks or so for all the alternatives
4. There appears to be little or no significant impact on EC levels in the channels of Paradise Cut under the different alternatives for the period of analysis.
5. There also appears to be no impact on EC levels in Old River channels as a result of pumping from San Joaquin River to Paradise Cut under the different alternatives for the period of analysis.
6. It appears that further analysis needs to be conducted with continuous sources of EC into Paradise Cut and for an extended period of simulation to more completely evaluate the impacts of pumping from San Joaquin River to Paradise Cut.

**COMPARISON OF RESULTS
UNDER BASELINE AND
ALTERNATIVE BARRIER
OPERATIONS**

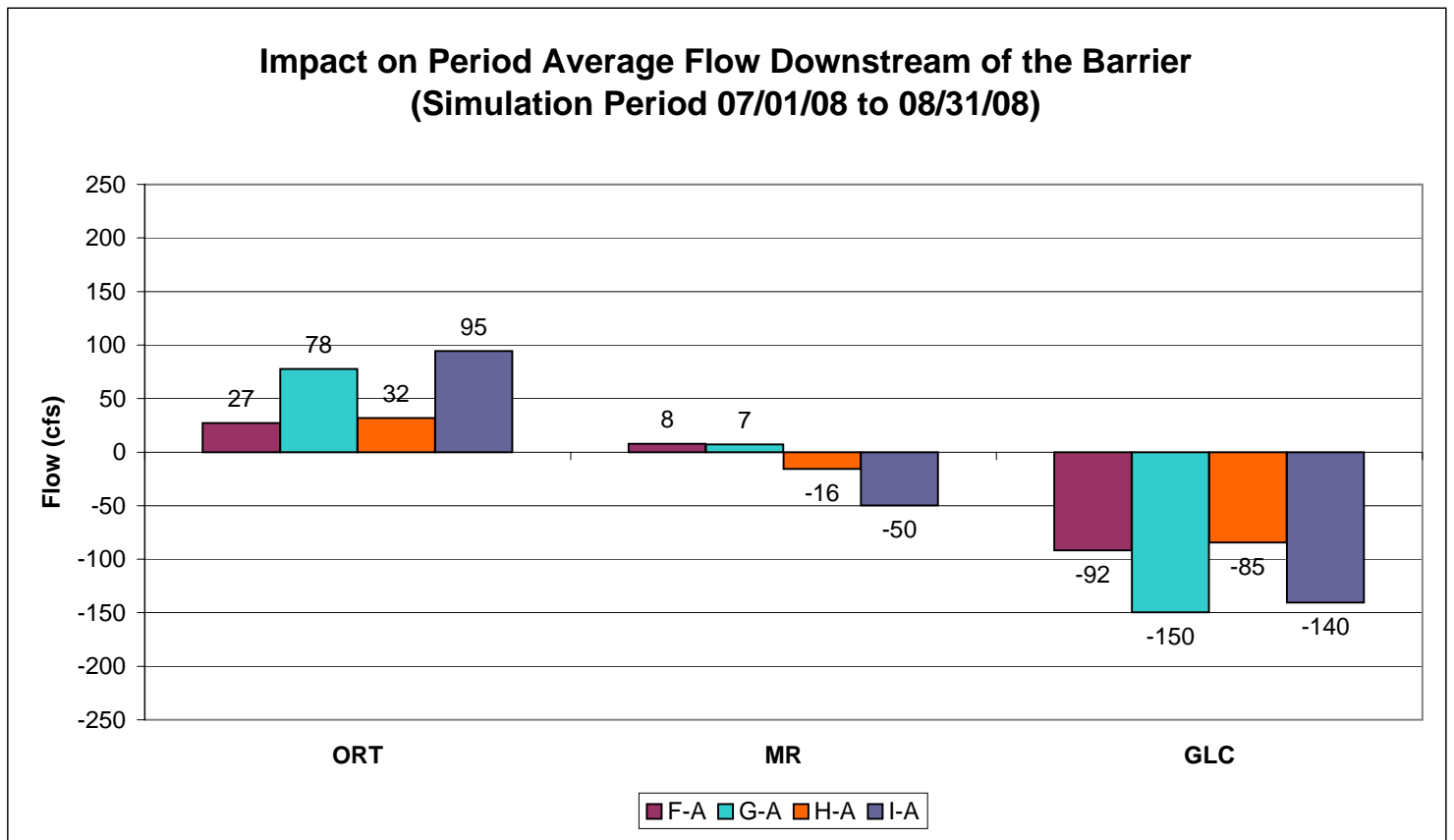
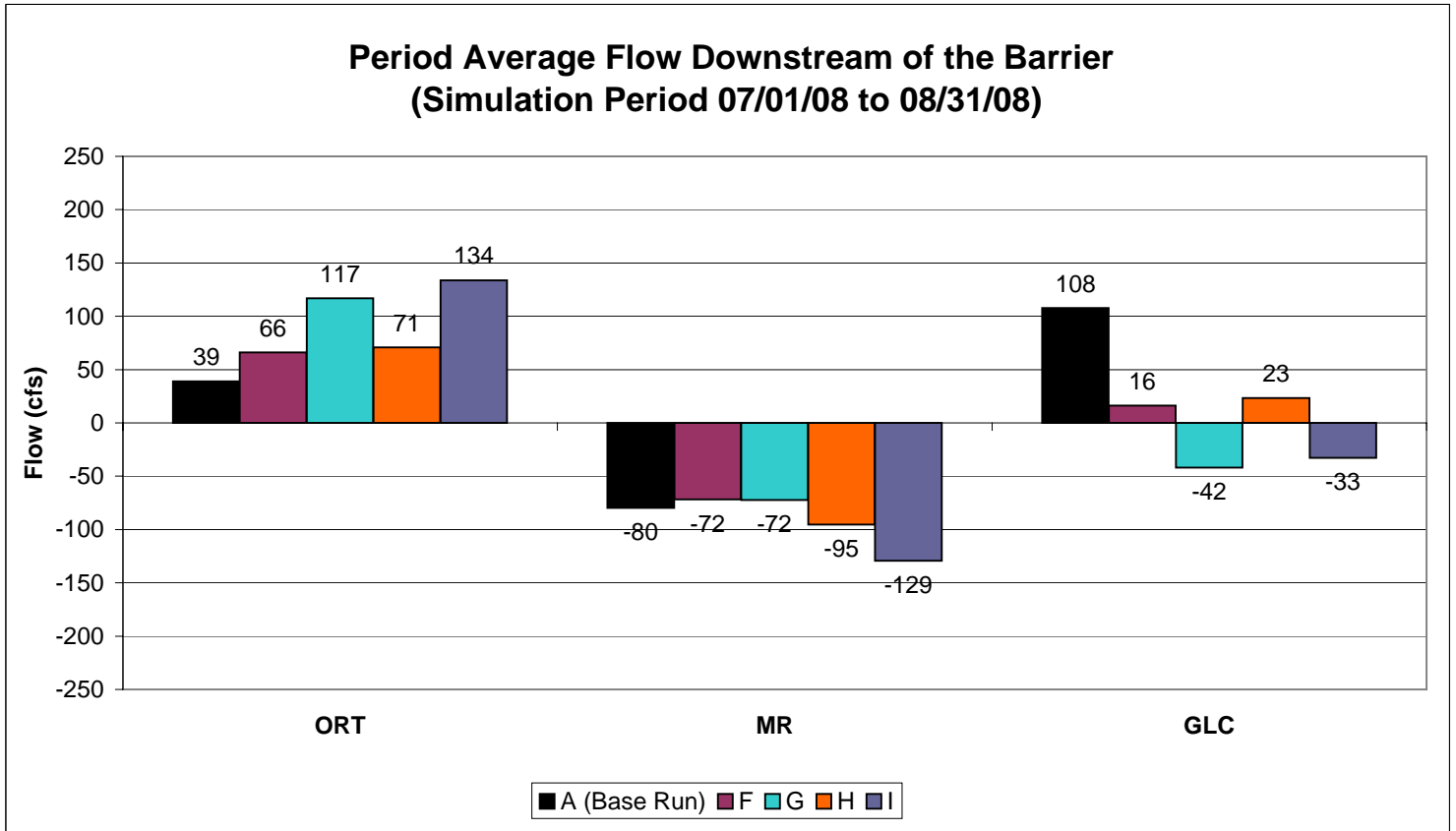
South Delta Alternatives Analysis Study Using DSM2 Simulations

South Delta Barrier Operations Alternatives Analyzed:

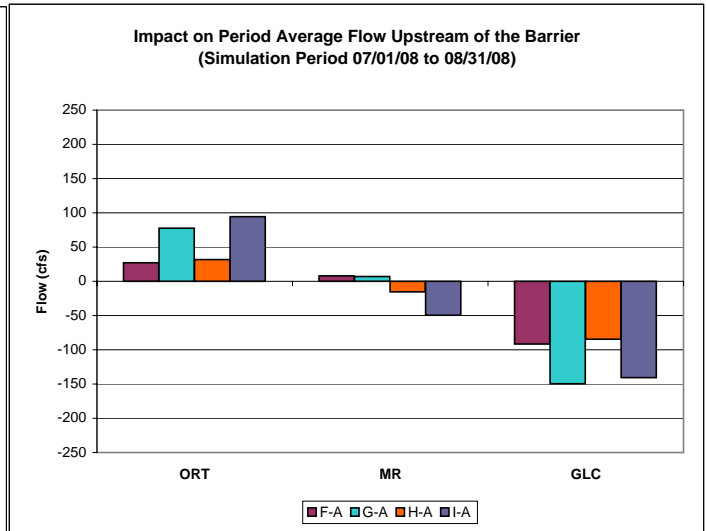
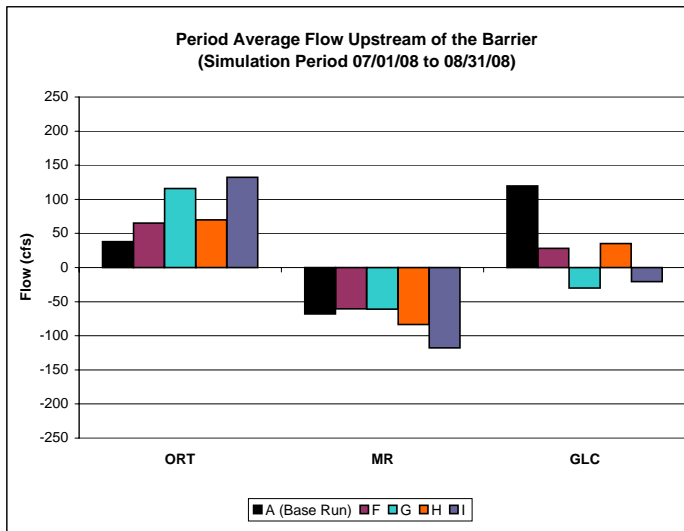
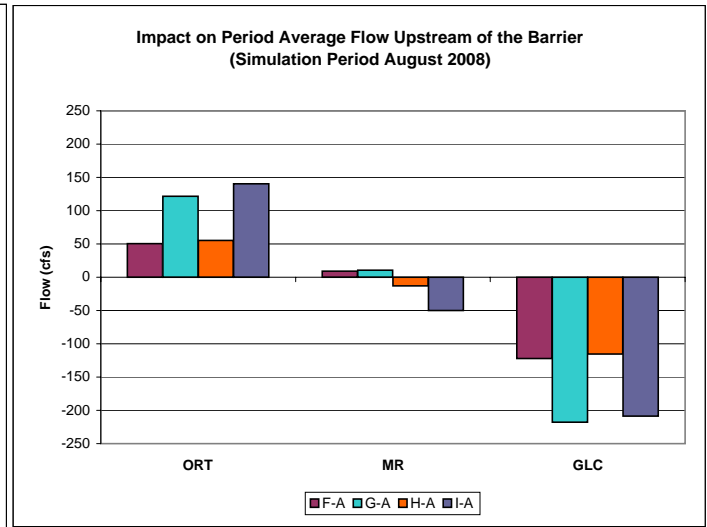
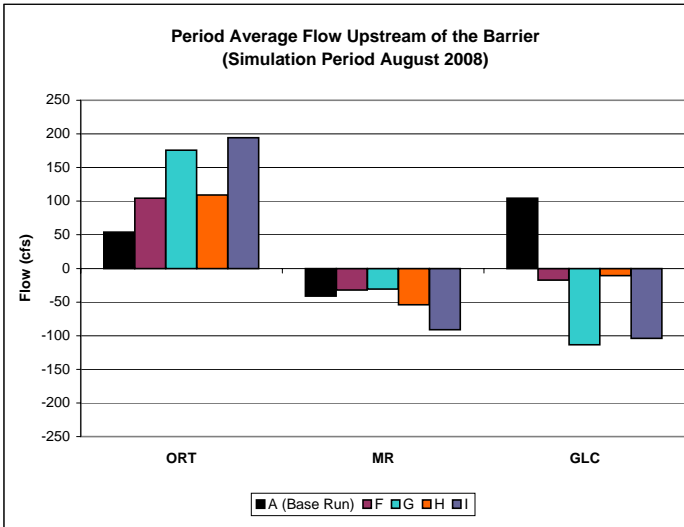
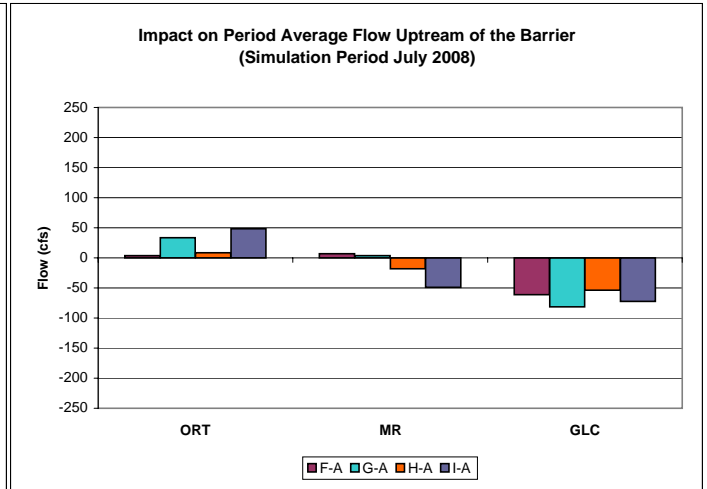
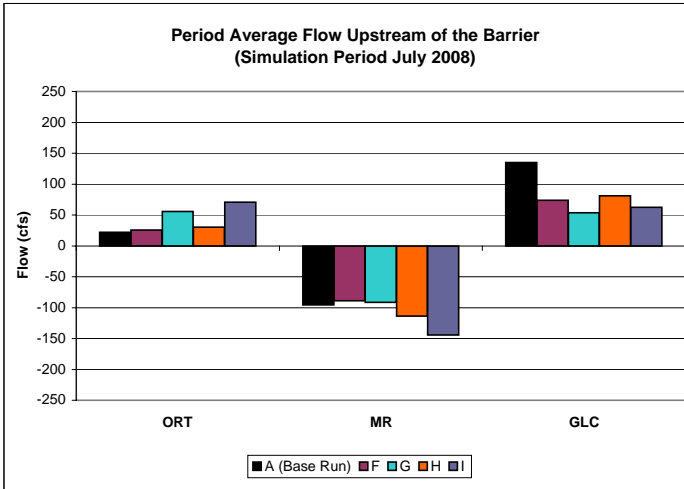
1. Scenario A: Baseline run based on historical data.
2. Scenario B: Increase Middle River (MR) barrier elevation by 0.5 feet.
3. Scenario C: Increase Middle River (MR) barrier elevation by 1.0 feet.
4. Scenario D: Increase the number of culverts in Middle River (MR) barrier from 6 to 8.
5. Scenario E: Increase the number of culverts in Middle River (MR) barrier from 6 to 10.
6. Scenario F: Decrease Old River at Tracy (ORT) barrier elevation by 0.5 feet and increase Grantline Canal (GLC) barrier elevation by 0.5 feet.
7. Scenario G: Decrease Old River at Tracy (ORT) barrier elevation by 1.0 feet and increase Grantline Canal (GLC) barrier elevation by 1.0 feet.
8. Scenario H: Scenario B plus Scenario D plus Scenario F.
9. Scenario I: Scenario C plus Scenario E plus Scenario G.

DSM2 Station Locations

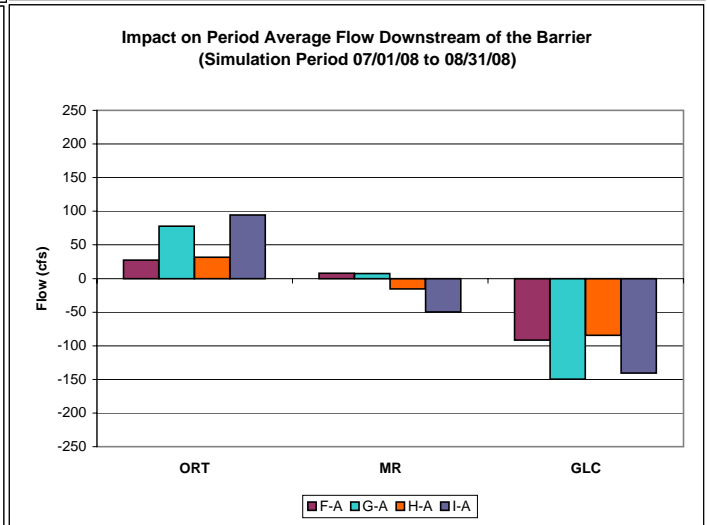
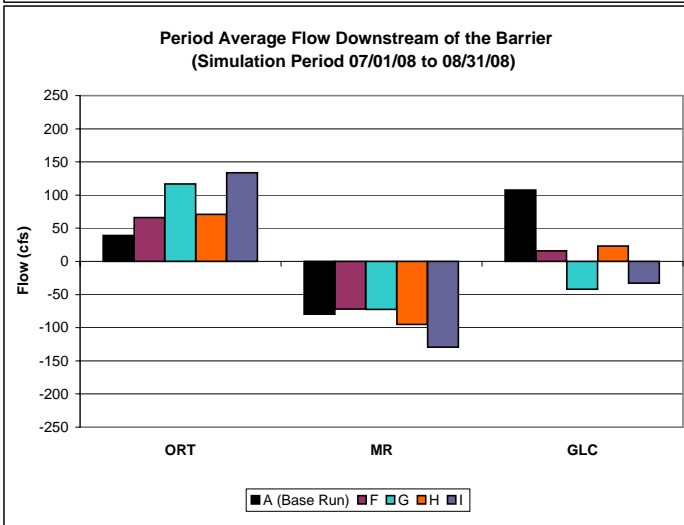
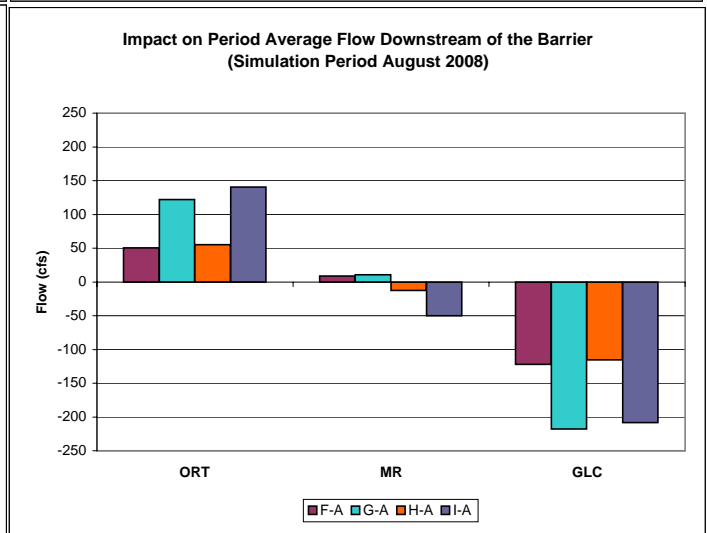
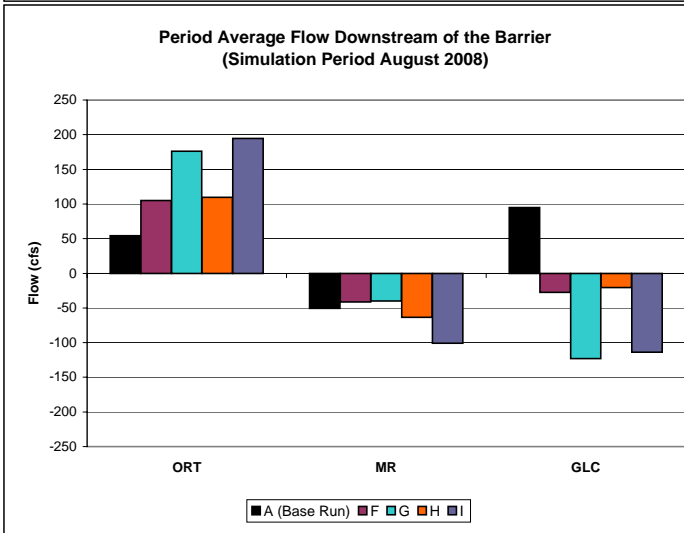
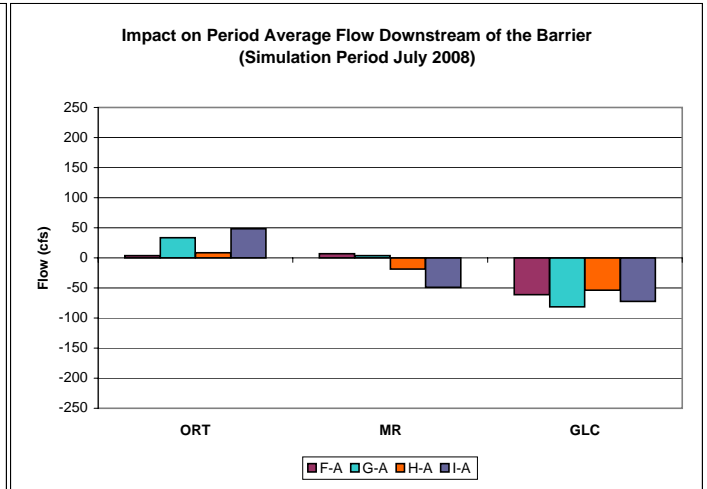
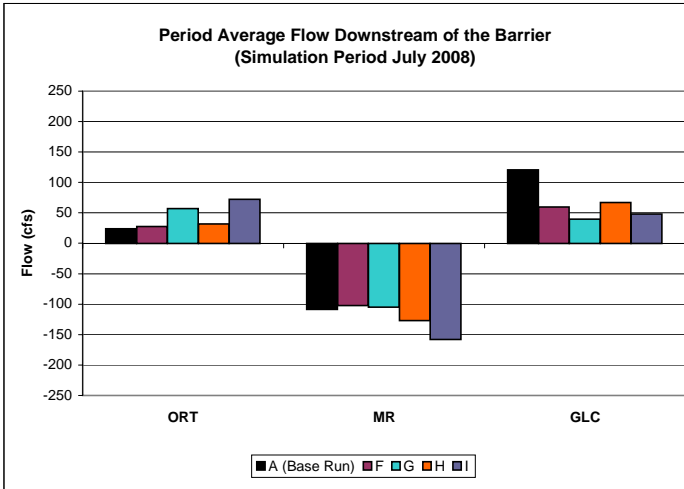




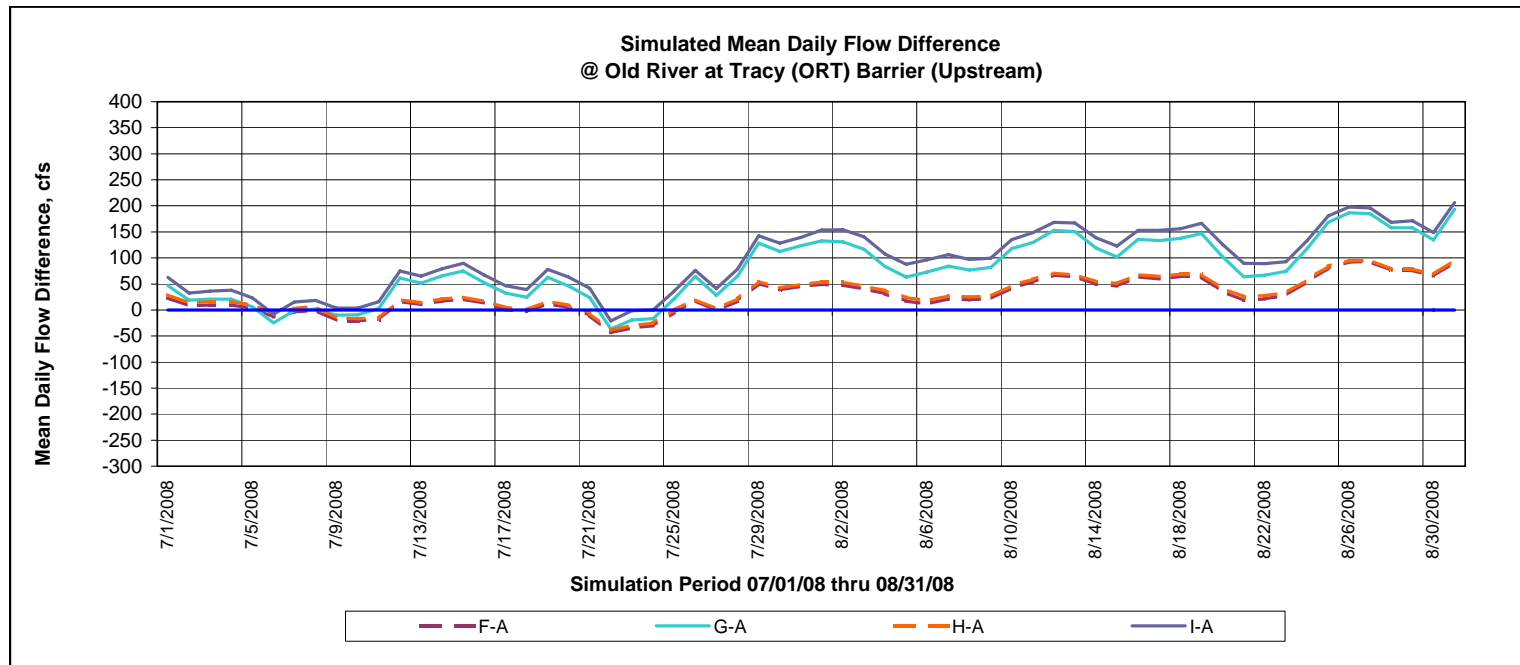
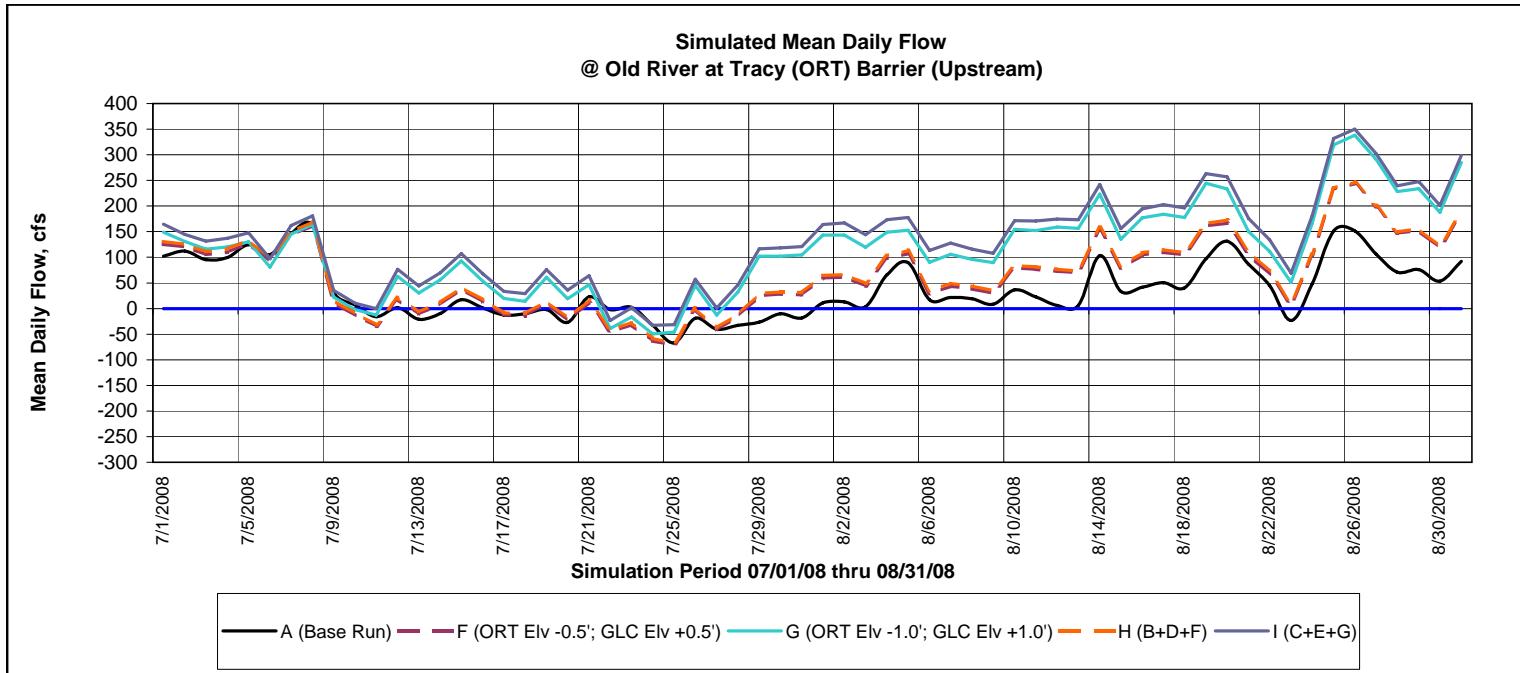
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|---|---|--------------------------|---------------------------|
| B = (MR Elv +0.5') | C = (MR Elv +1.0') | D = (MR Npipes 8) | E = (MR Npipes 10) |
| F = (ORT Elv -0.5'; GLC Elv +0.5') | G = (ORT Elv -1.0'; GLC Elv +1.0') | H = (B+D+F) | I = (C+E+G) |

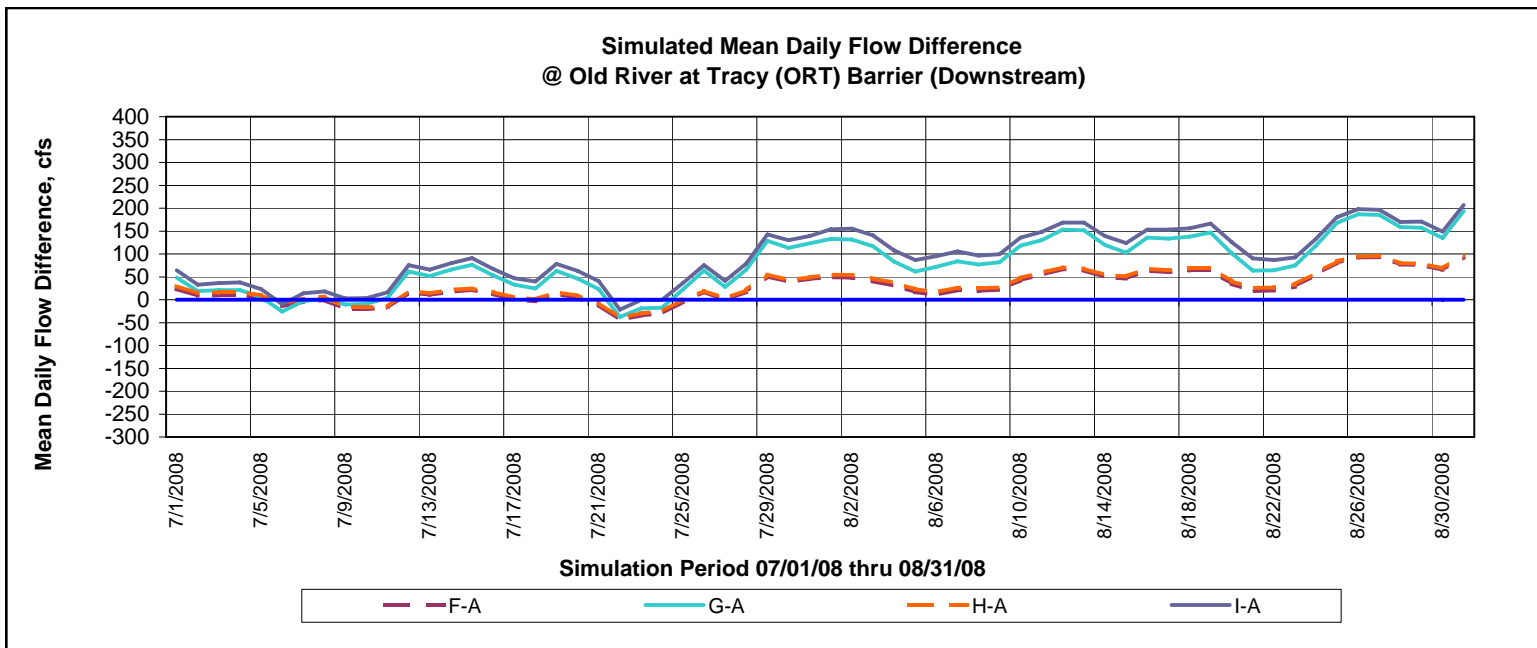
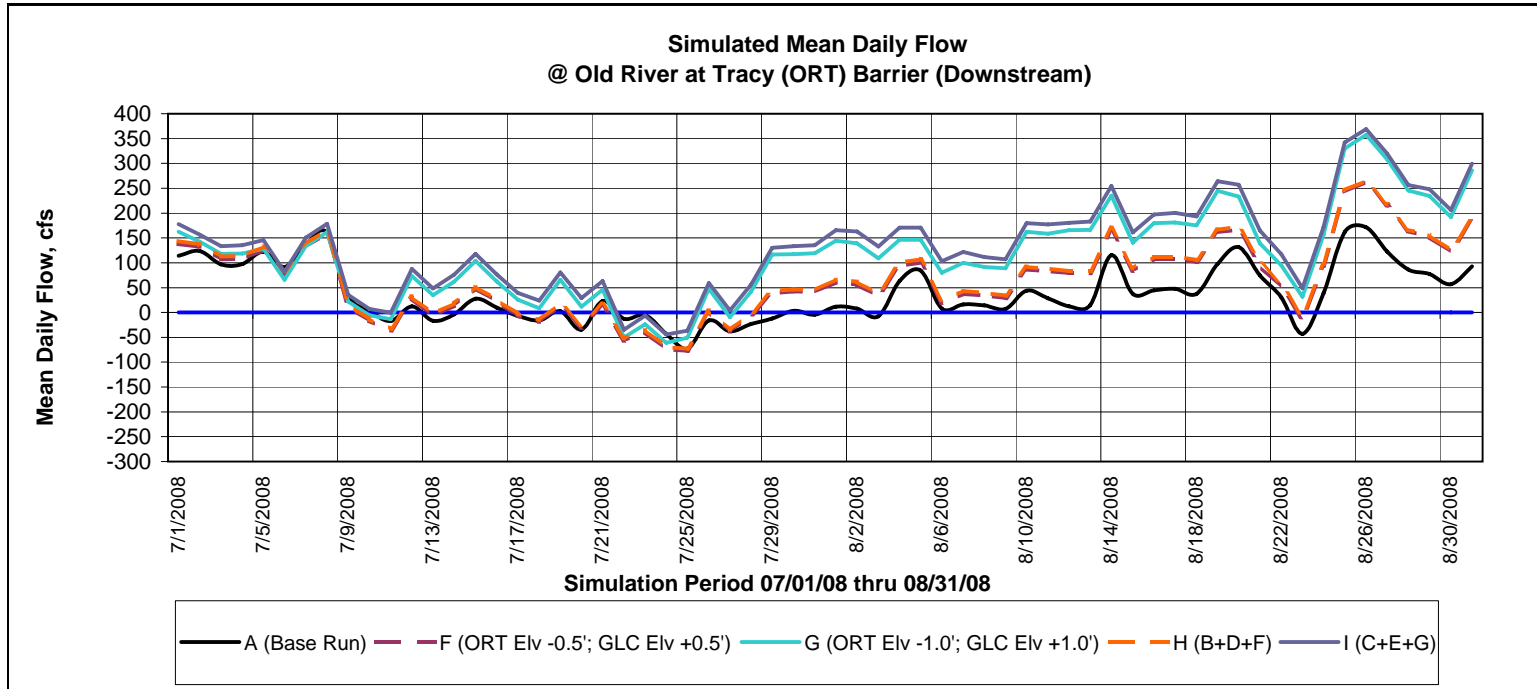


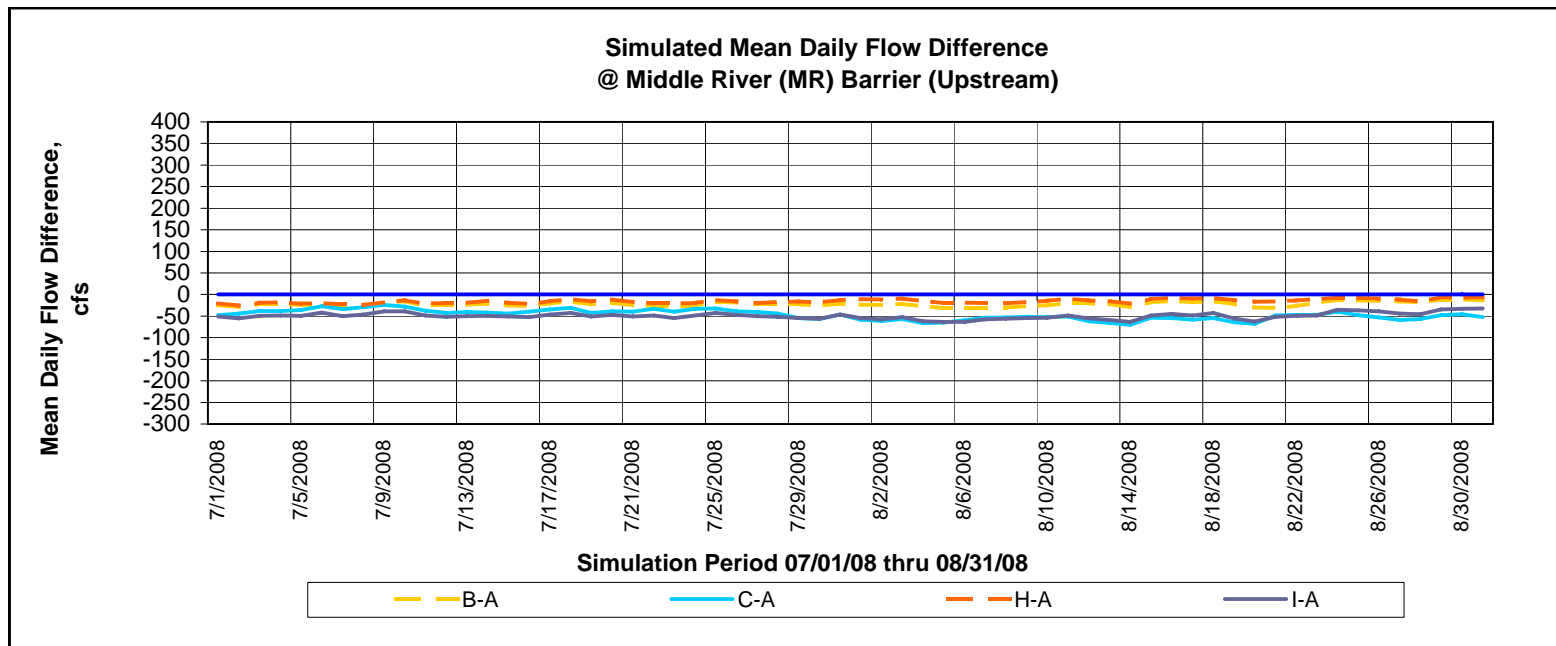
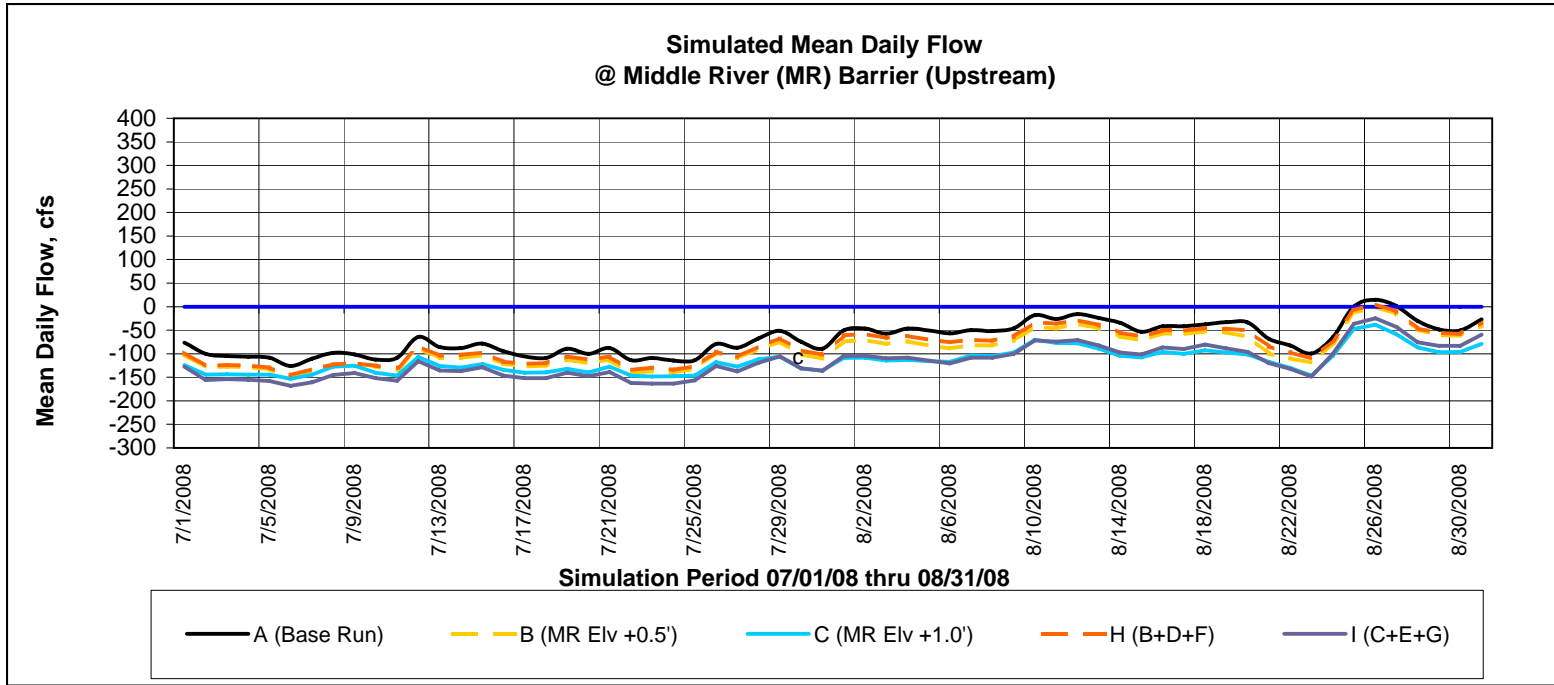
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| B = (MR Elv +0.5') | C = (MR Elv +1.0') | D = (MR Npipes 8) | E = (MR Npipes 10) |
| F = (ORT Elv -0.5'; GLC Elv +0.5') | G = (ORT Elv -1.0'; GLC Elv +1.0') | H = (B+D+F) | I = (C+E+G) |

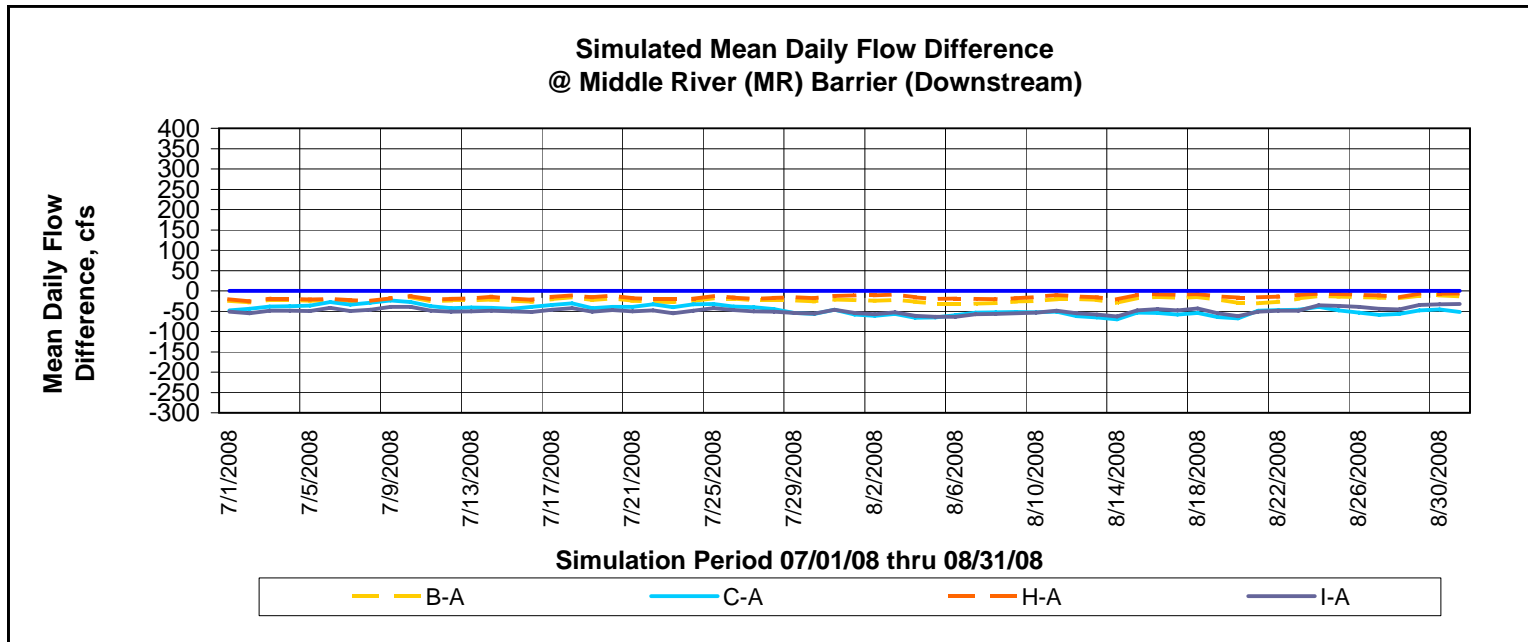
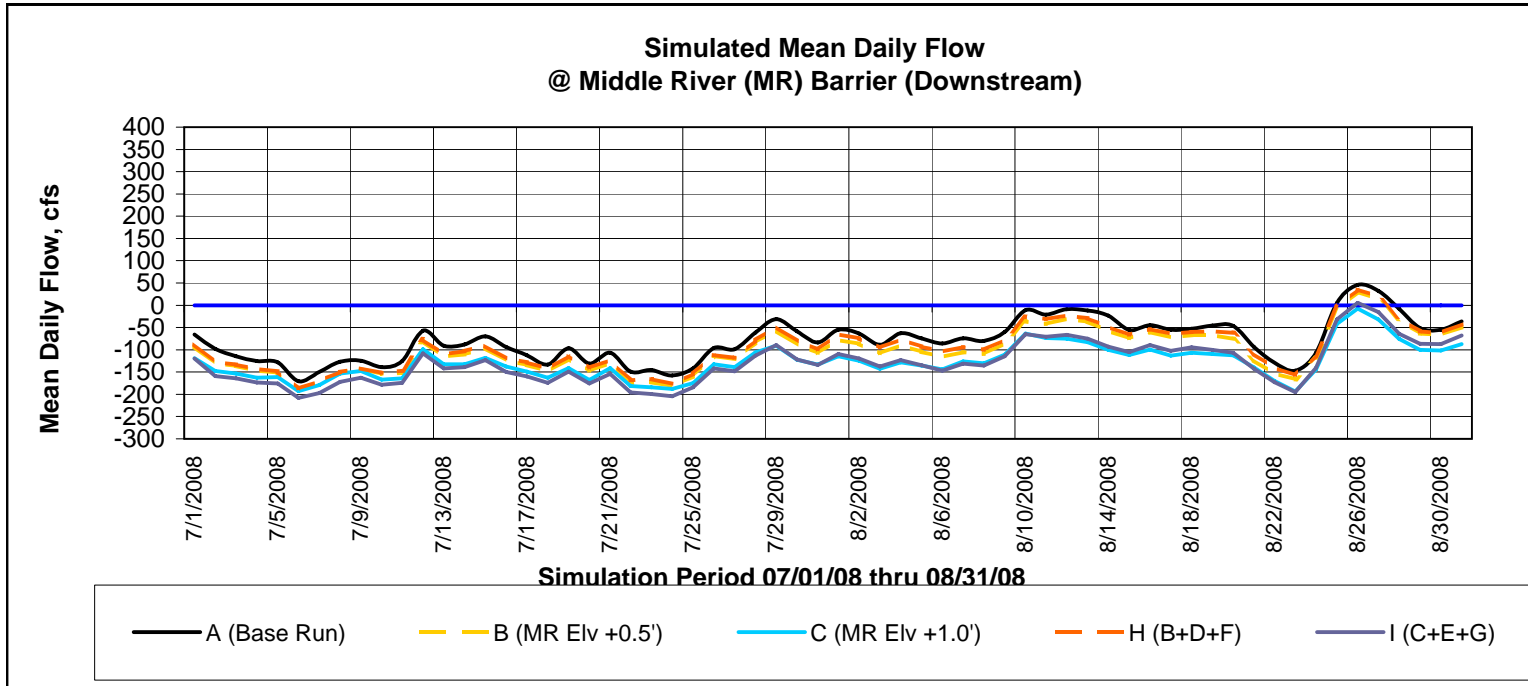


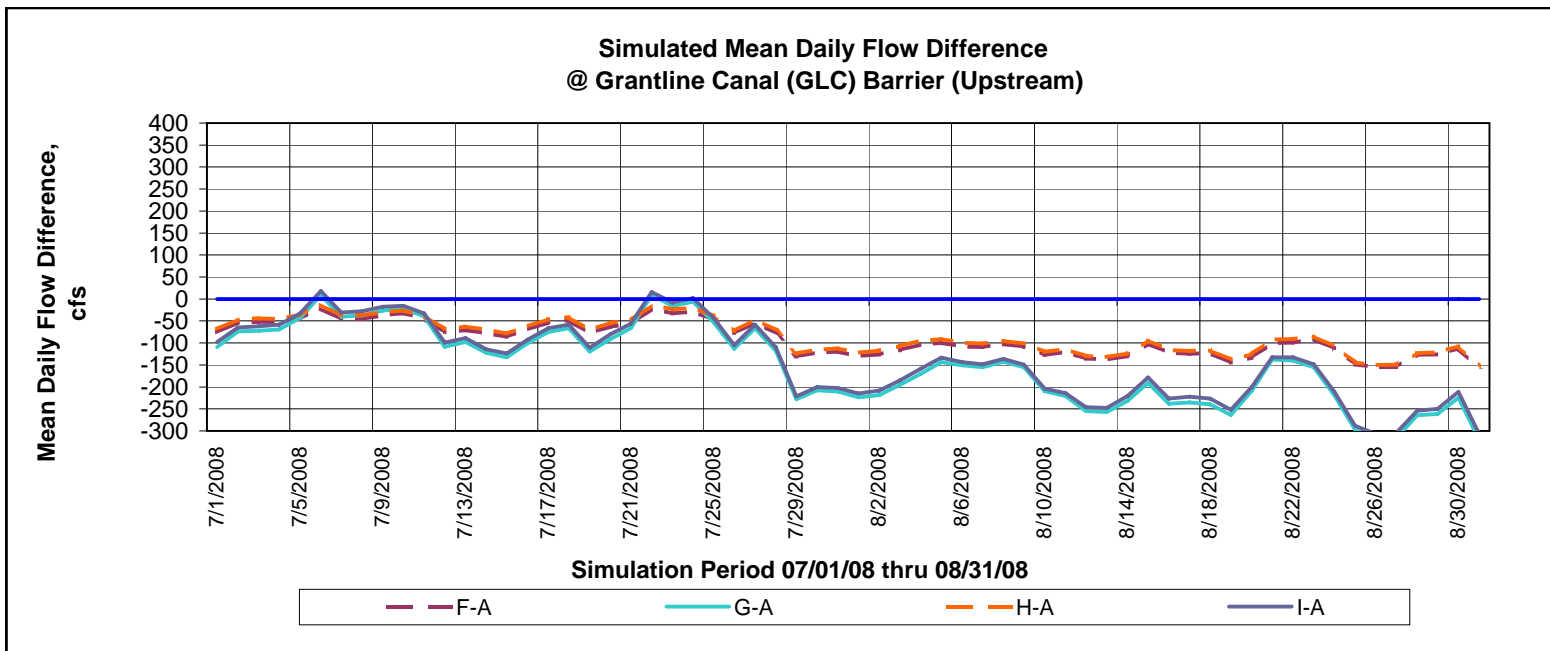
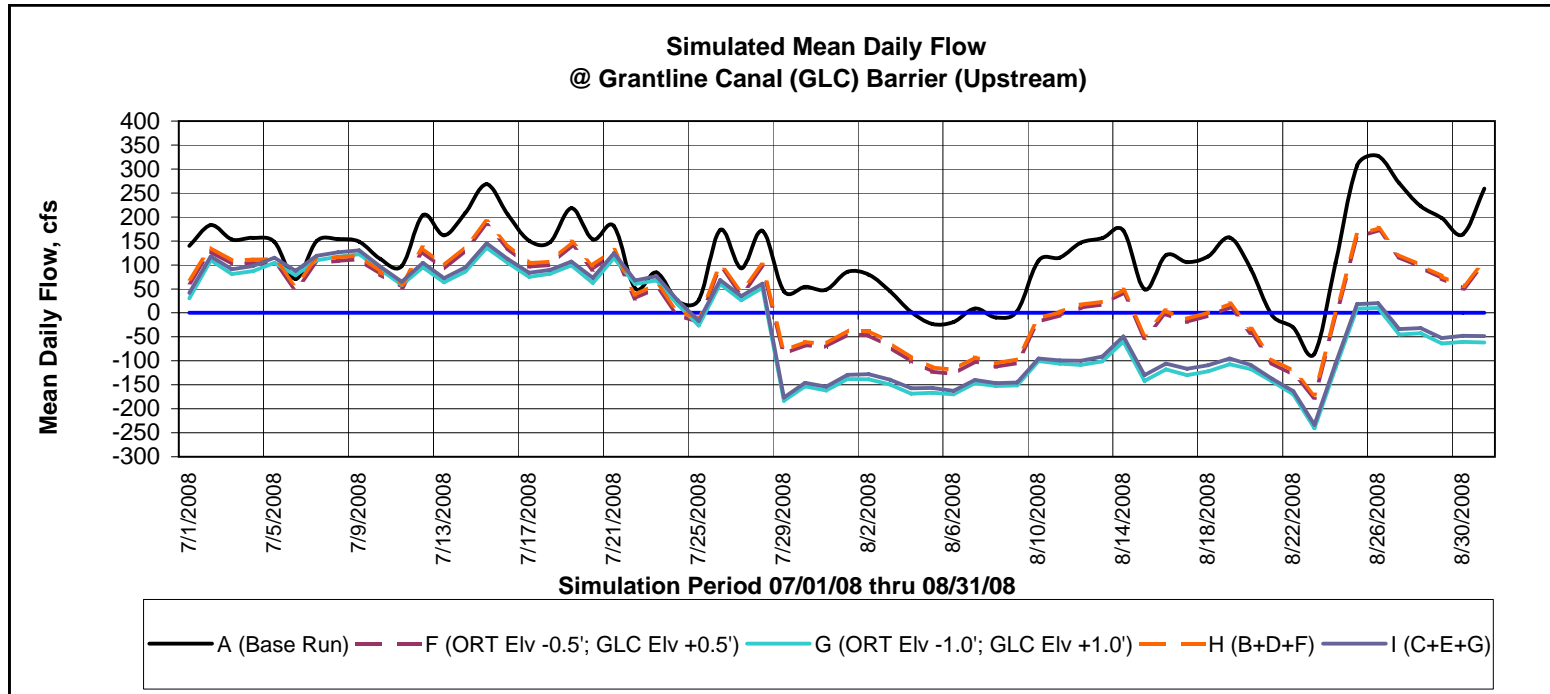
| | | | |
|---|---|--------------------------|---------------------------|
| B = (MR Elv +0.5') | C = (MR Elv +1.0') | D = (MR Npipes 8) | E = (MR Npipes 10) |
| F = (ORT Elv -0.5'; GLC Elv +0.5') | G = (ORT Elv -1.0'; GLC Elv +1.0') | H = (B+D+F) | I = (C+E+G) |

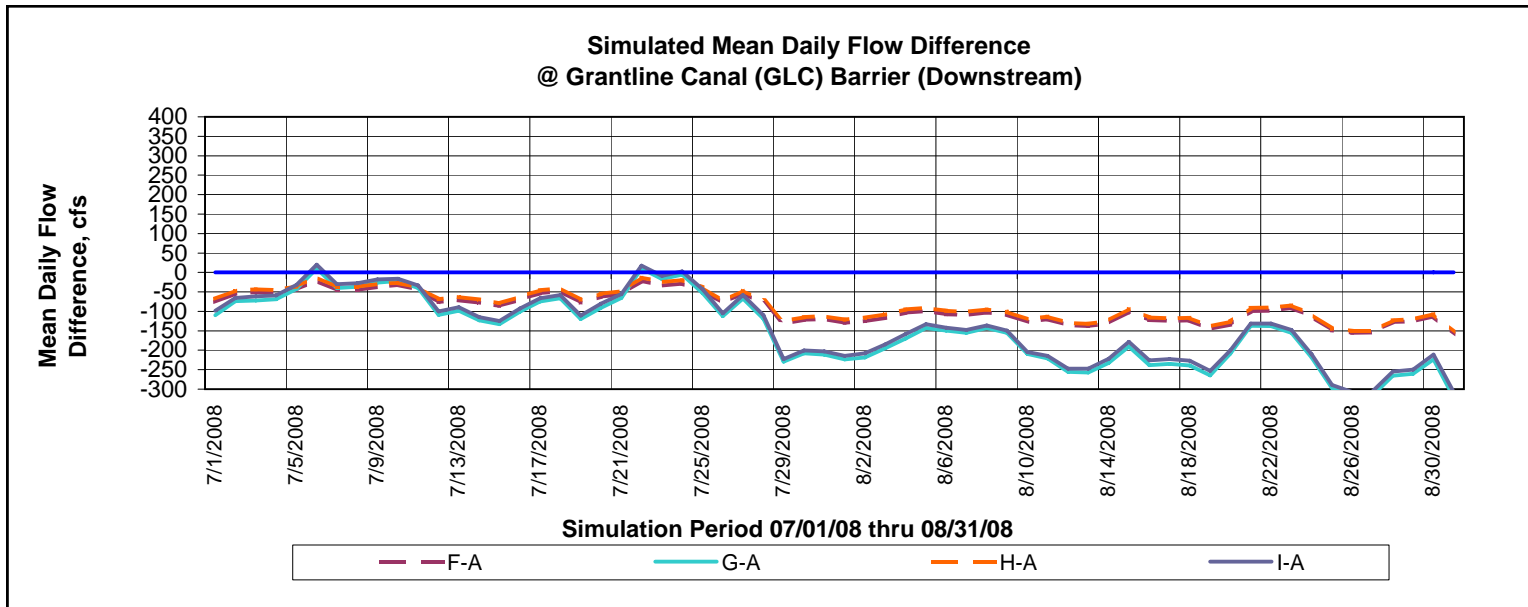
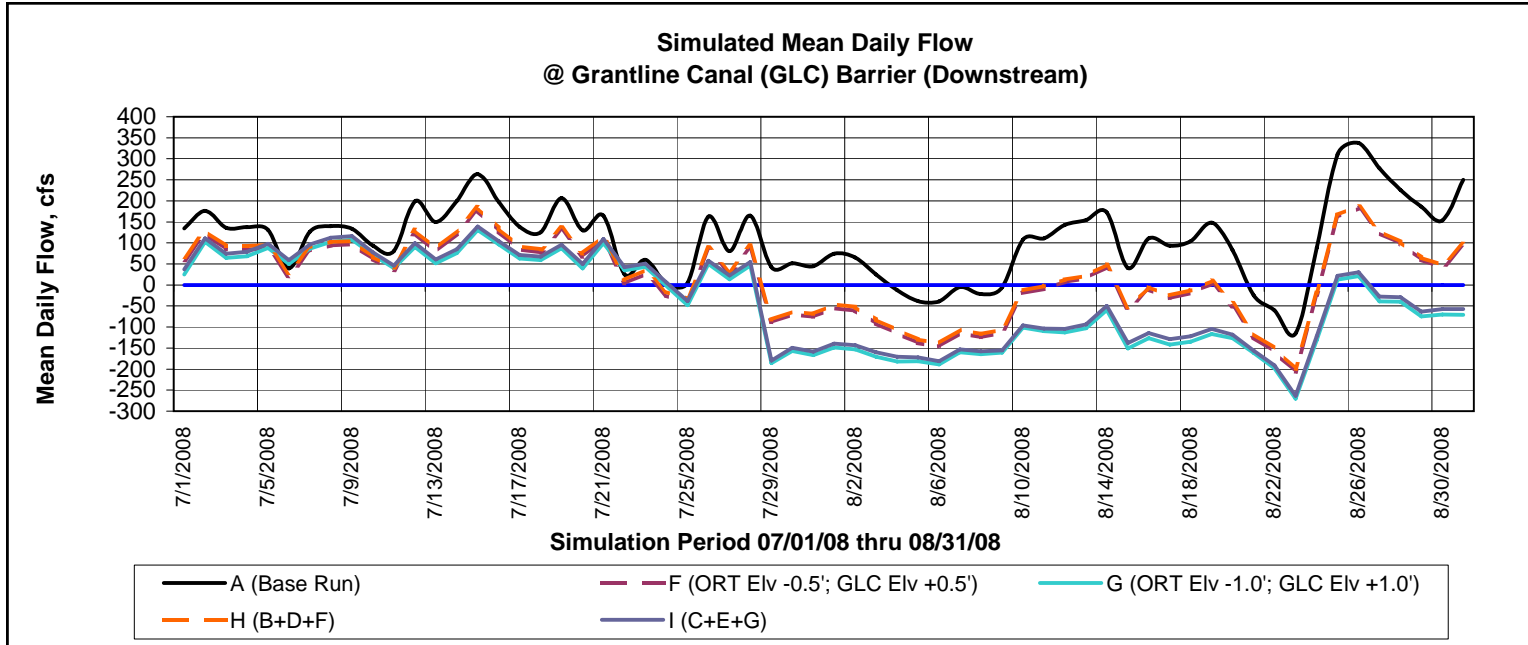


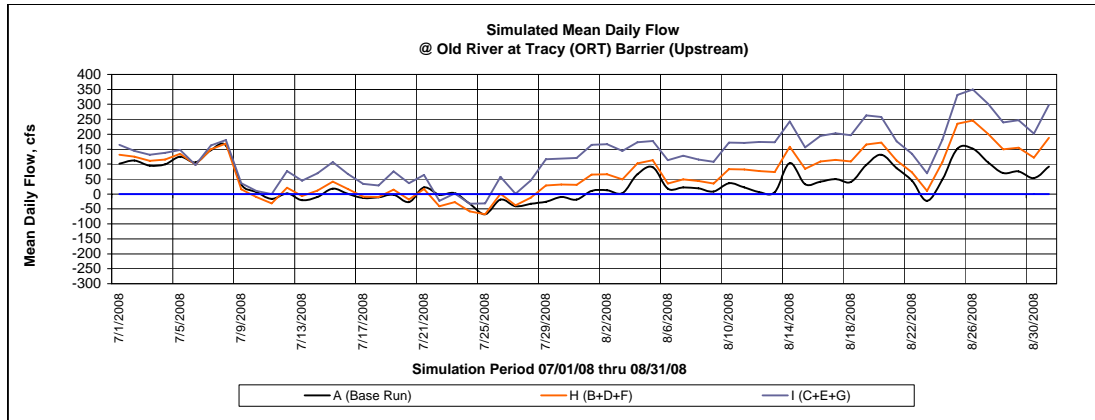
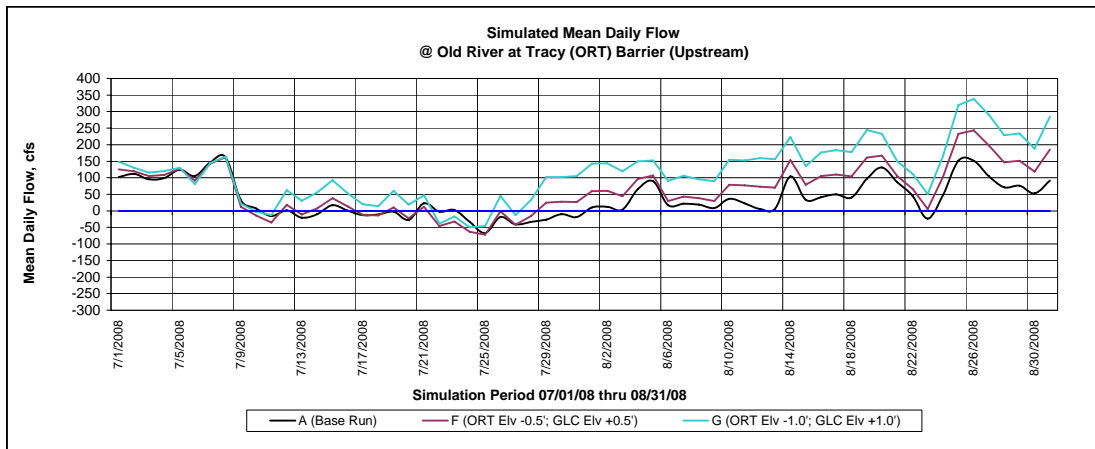
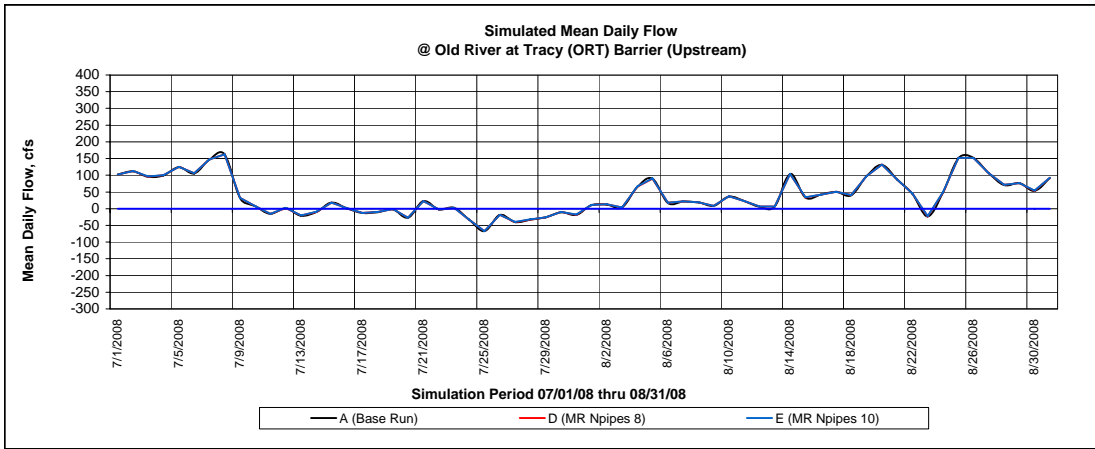
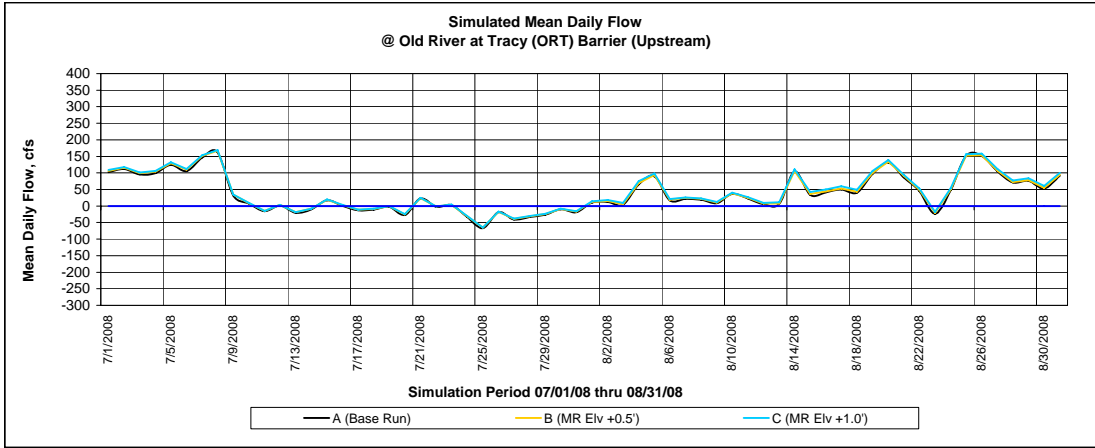


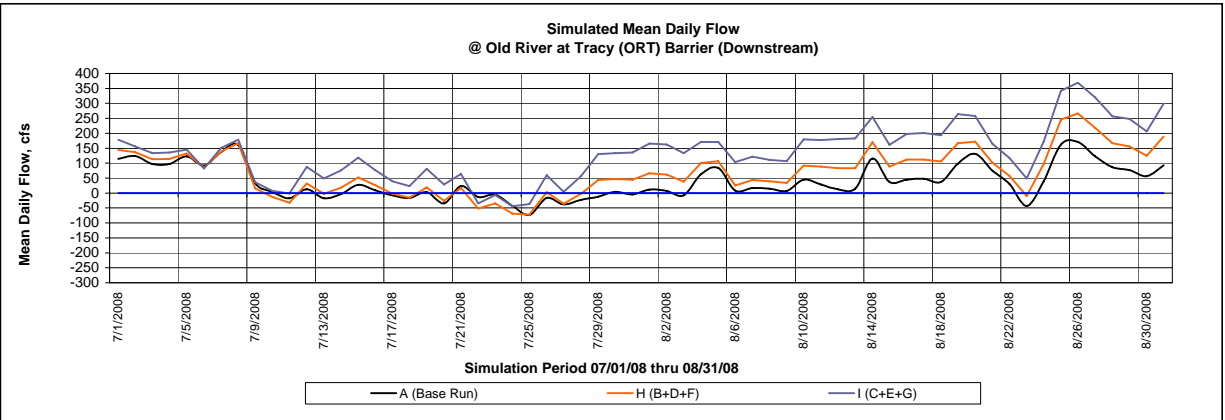
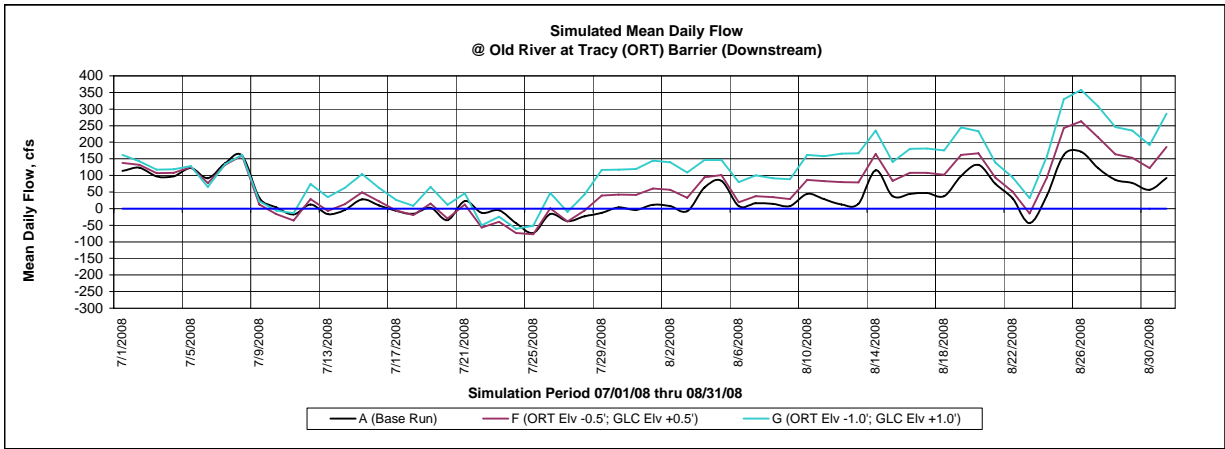
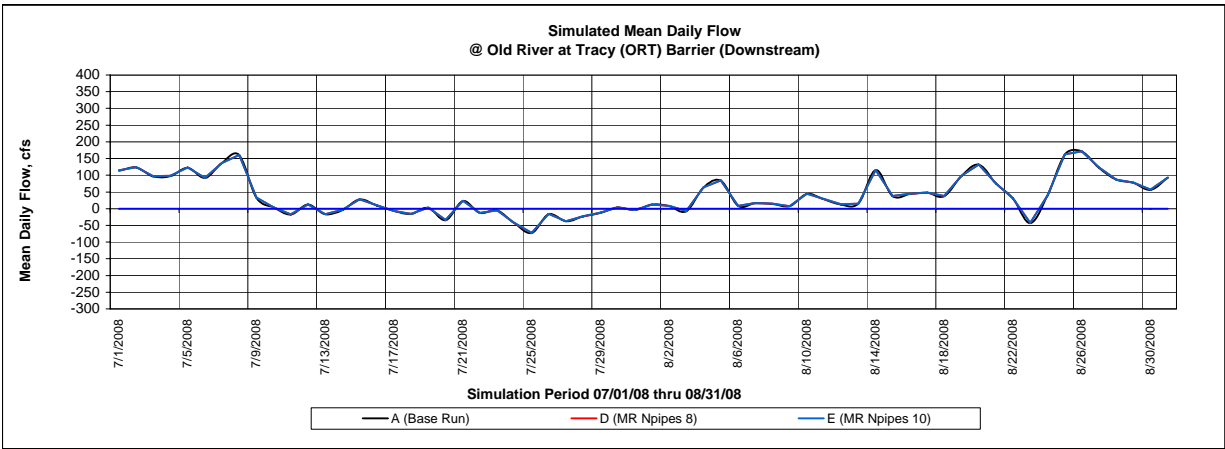
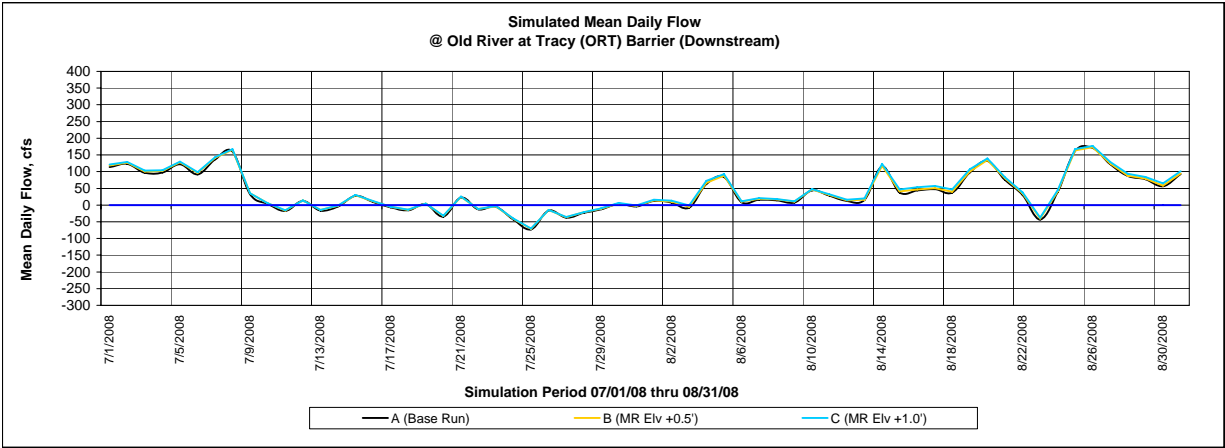


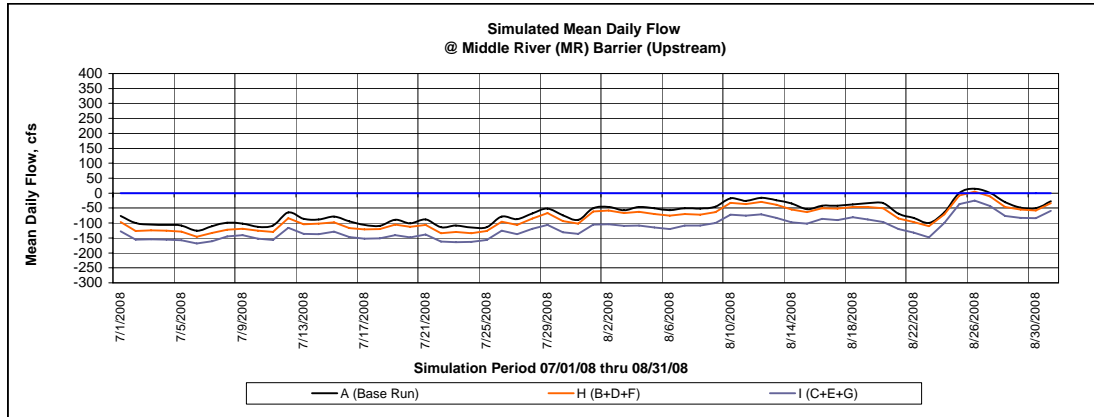
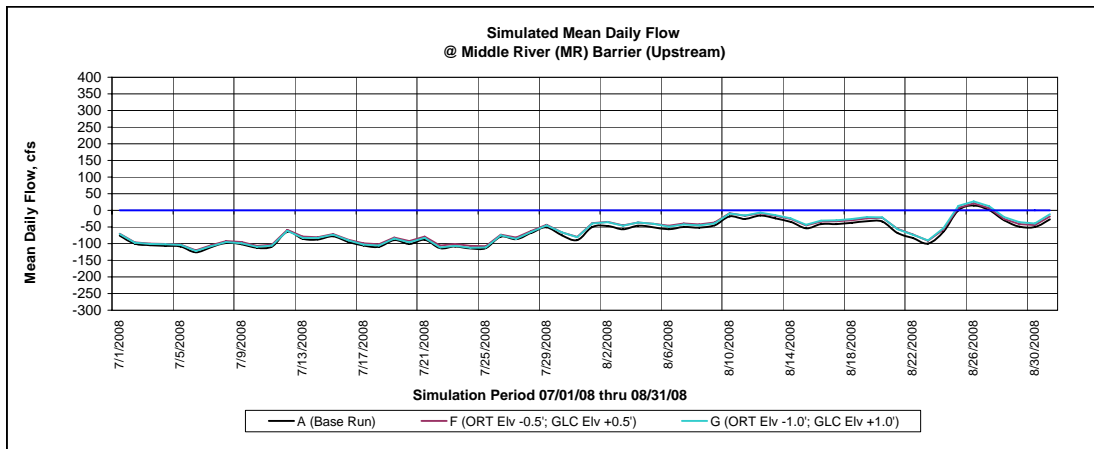
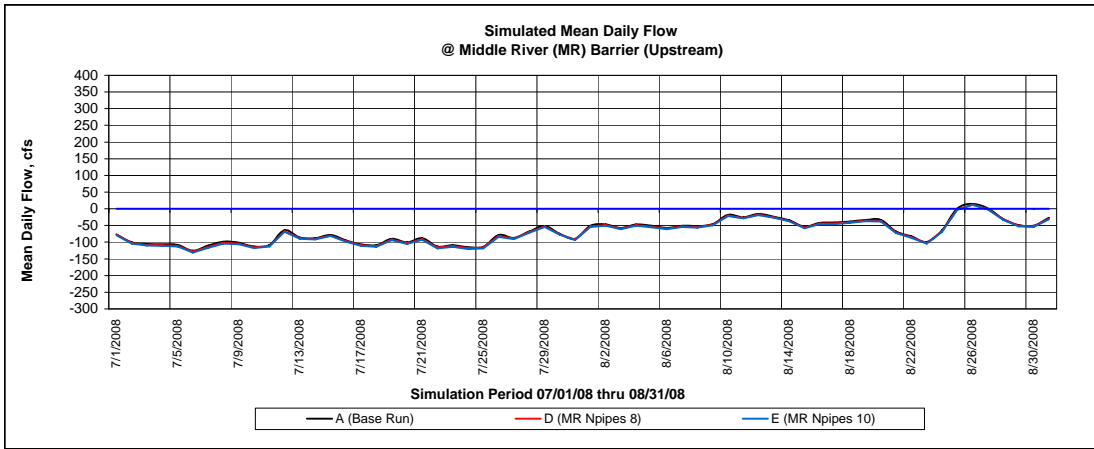
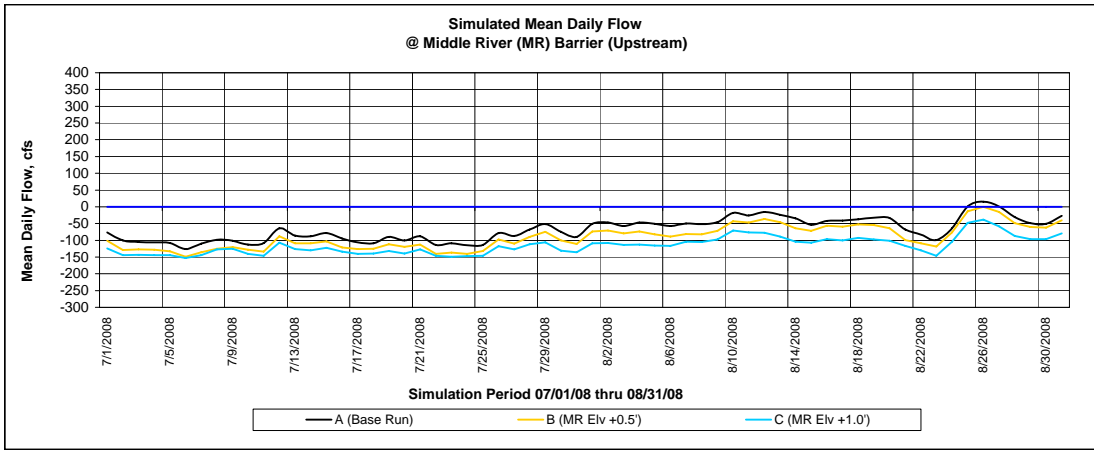


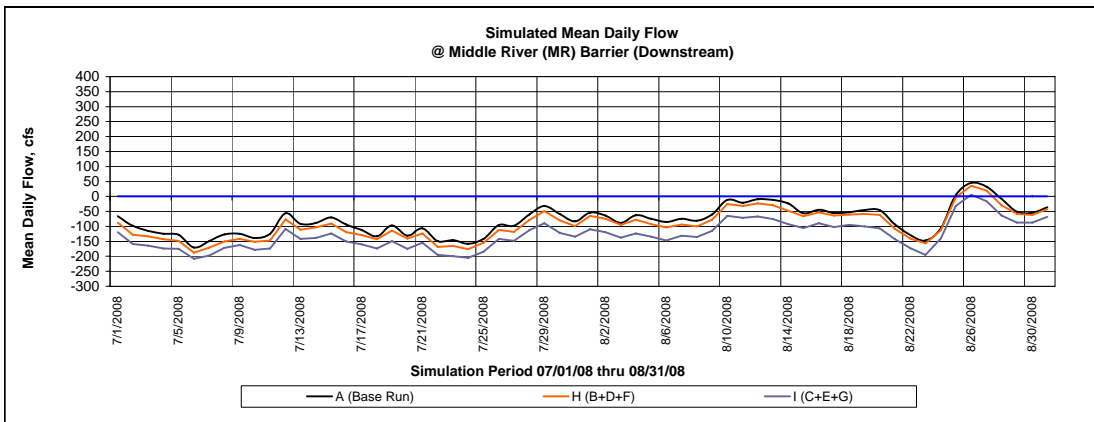
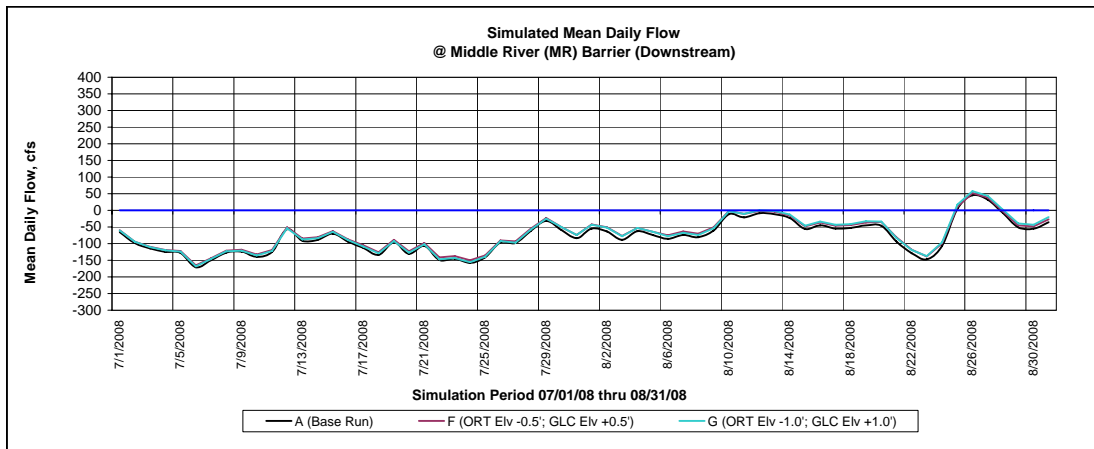
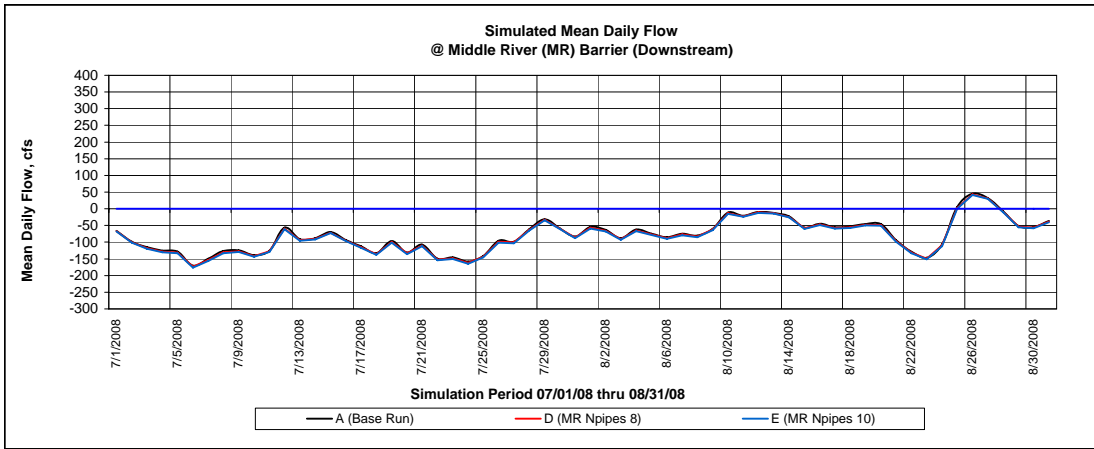
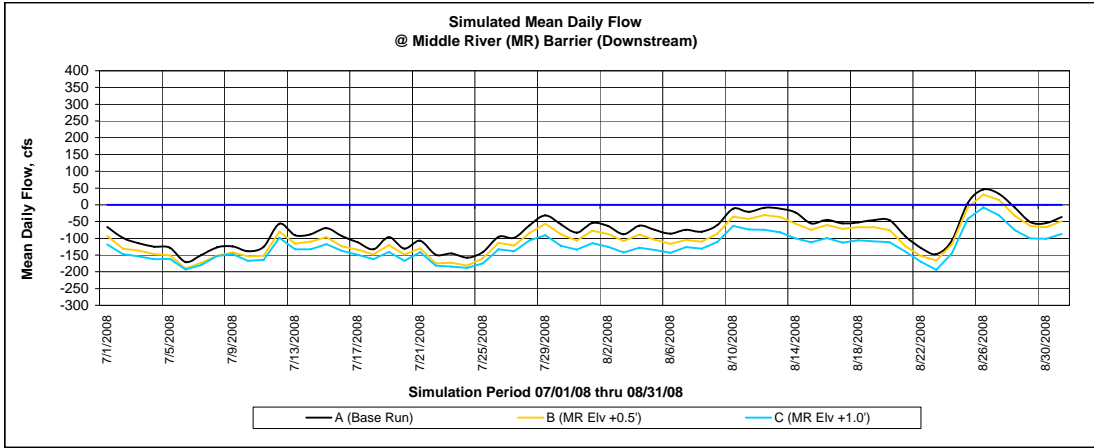


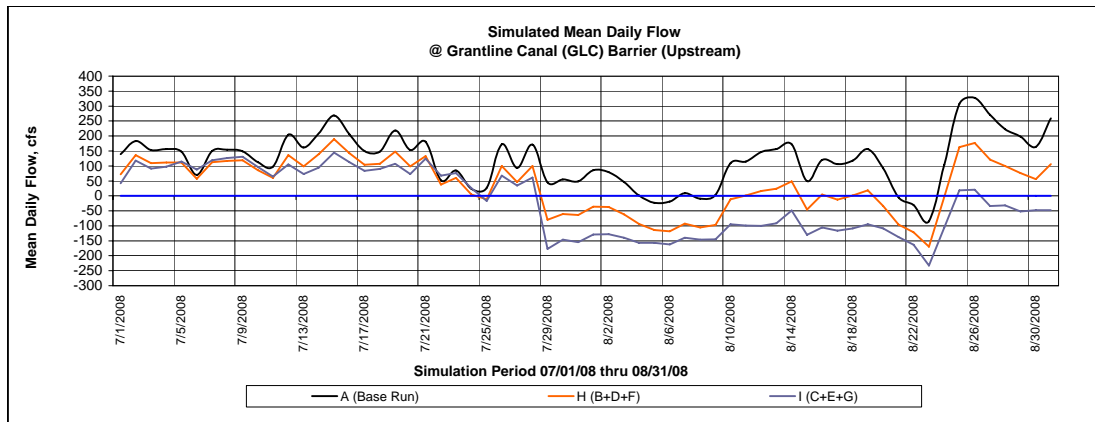
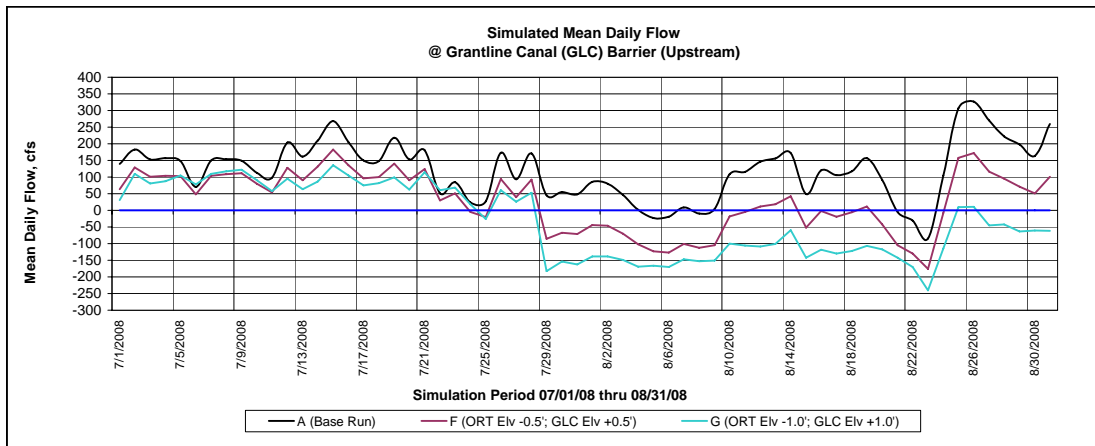
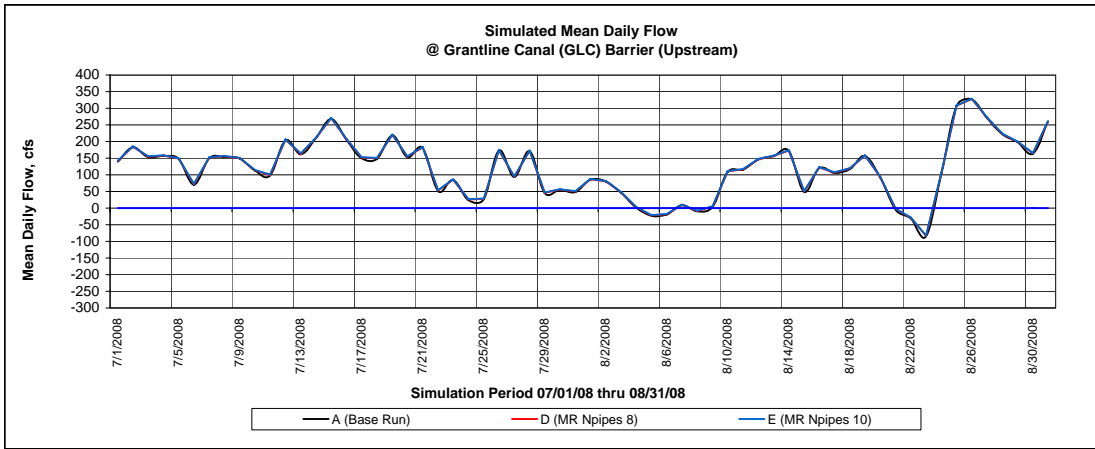
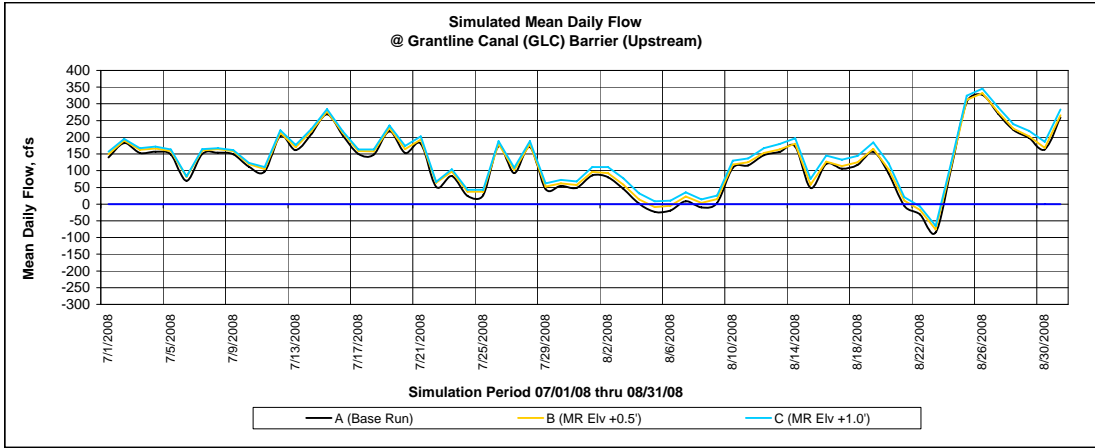


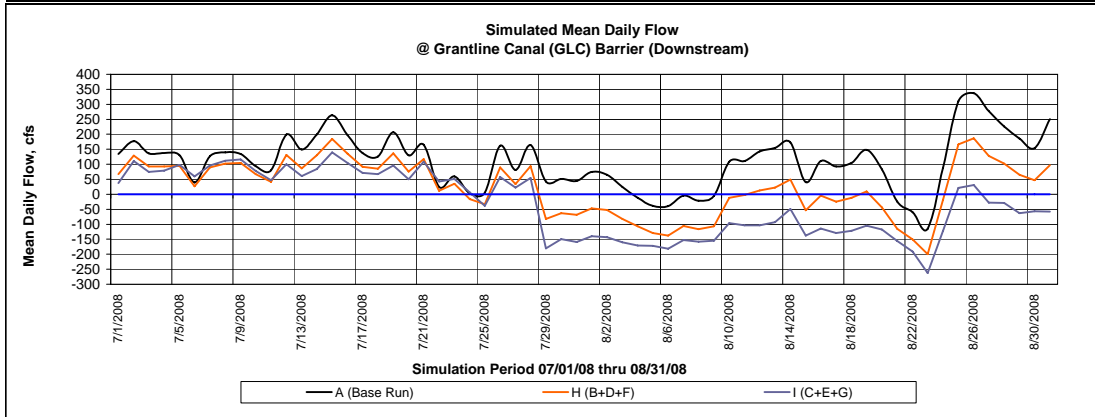
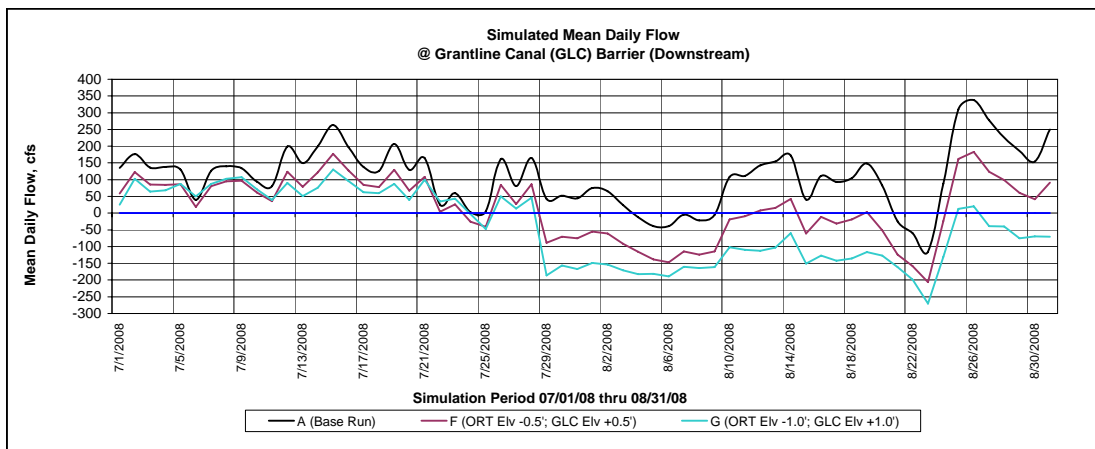
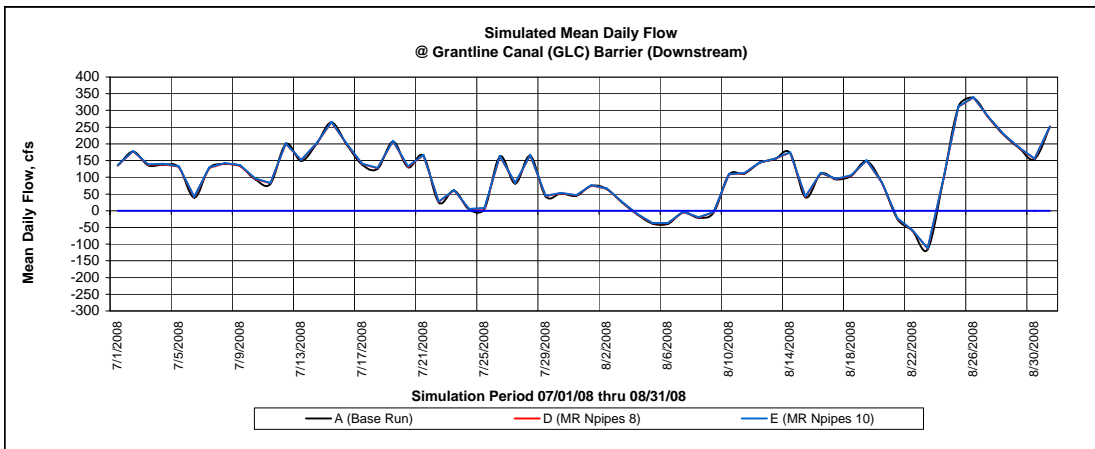
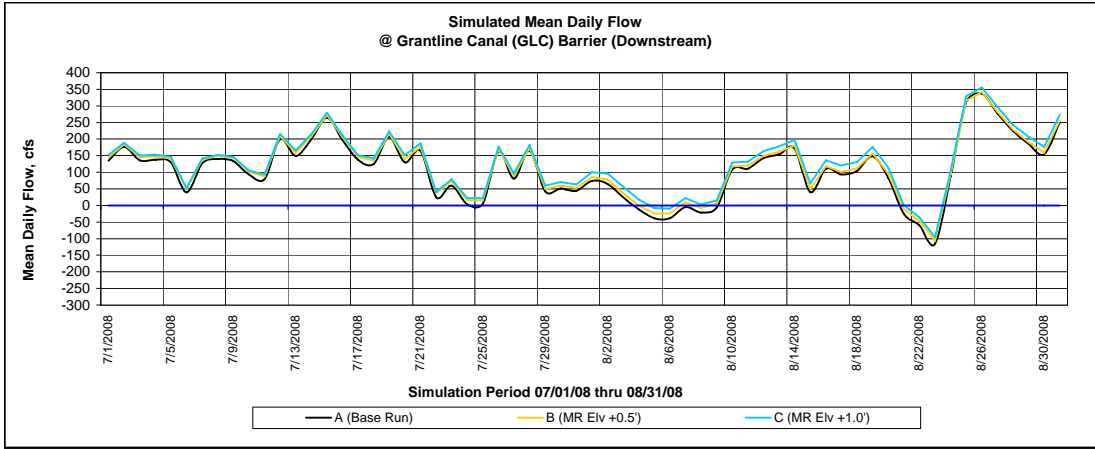












**COMPARISON OF RESULTS
UNDER BASELINE AND
ALTERNATIVE LEVELS OF
PUMPING FOR SJ RIVER TO
PARADISE CUT**

South Delta Alternatives Analysis Study Using DSM2 Simulations

Paradise Cut Alternatives Analyzed:

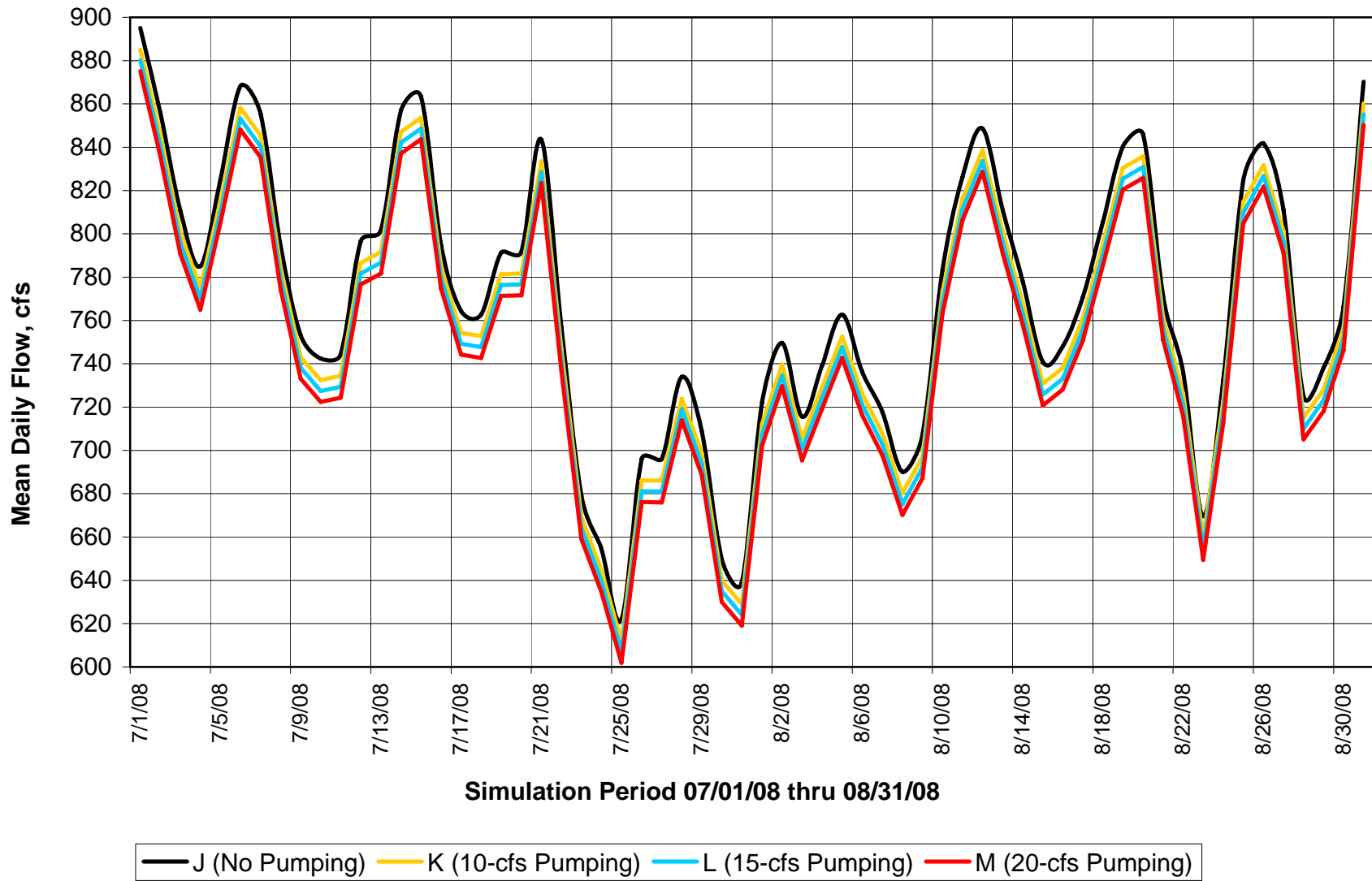
1. Scenario J: Baseline run based on historical data. No pumping from San Joaquin River to Paradise Cut.
2. Scenario K: 10 cfs pumping from San Joaquin River to Paradise Cut.
2. Scenario L: 15 cfs pumping from San Joaquin River to Paradise Cut.
2. Scenario M: 20 cfs pumping from San Joaquin River to Paradise Cut.

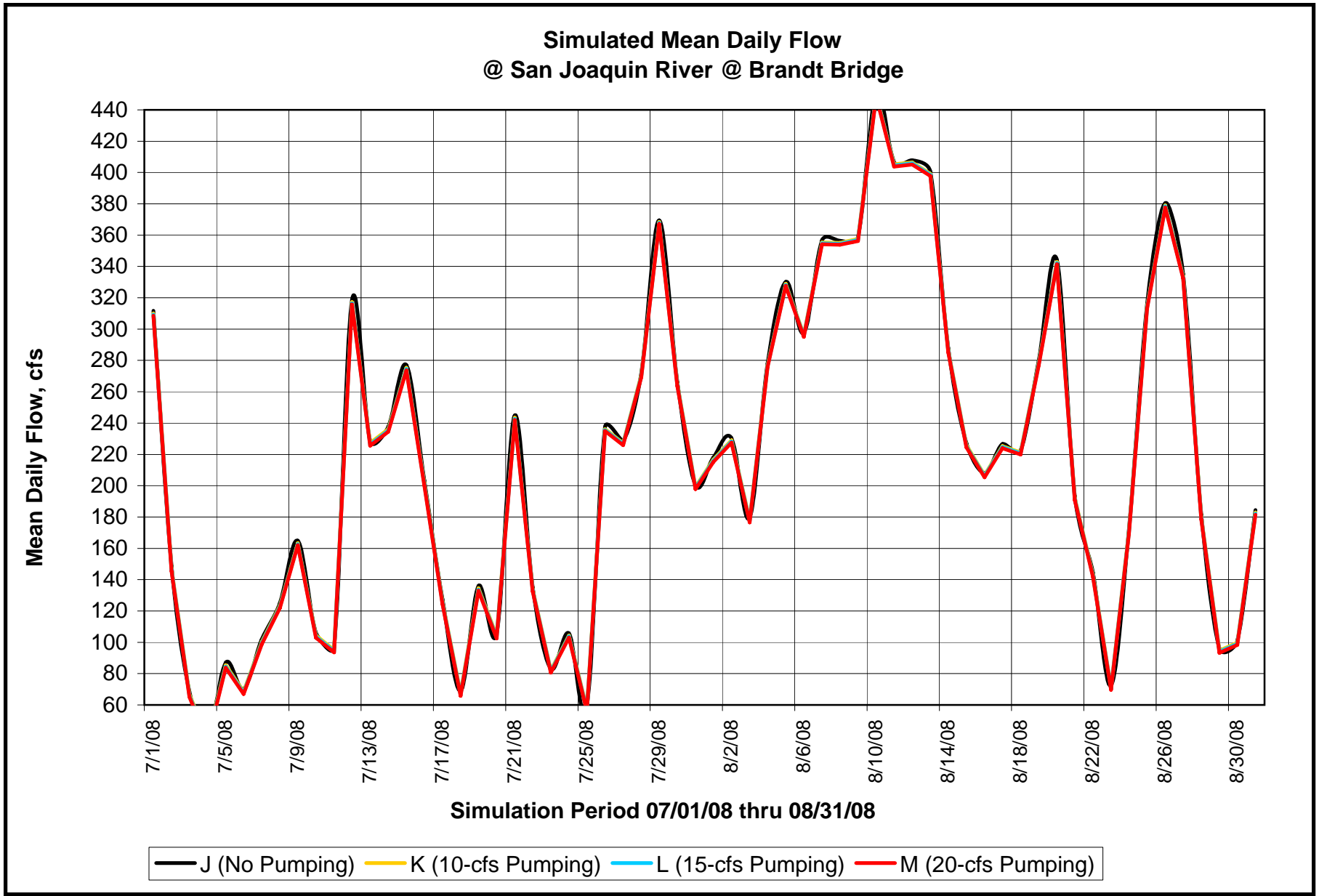
DSM2 Station Locations

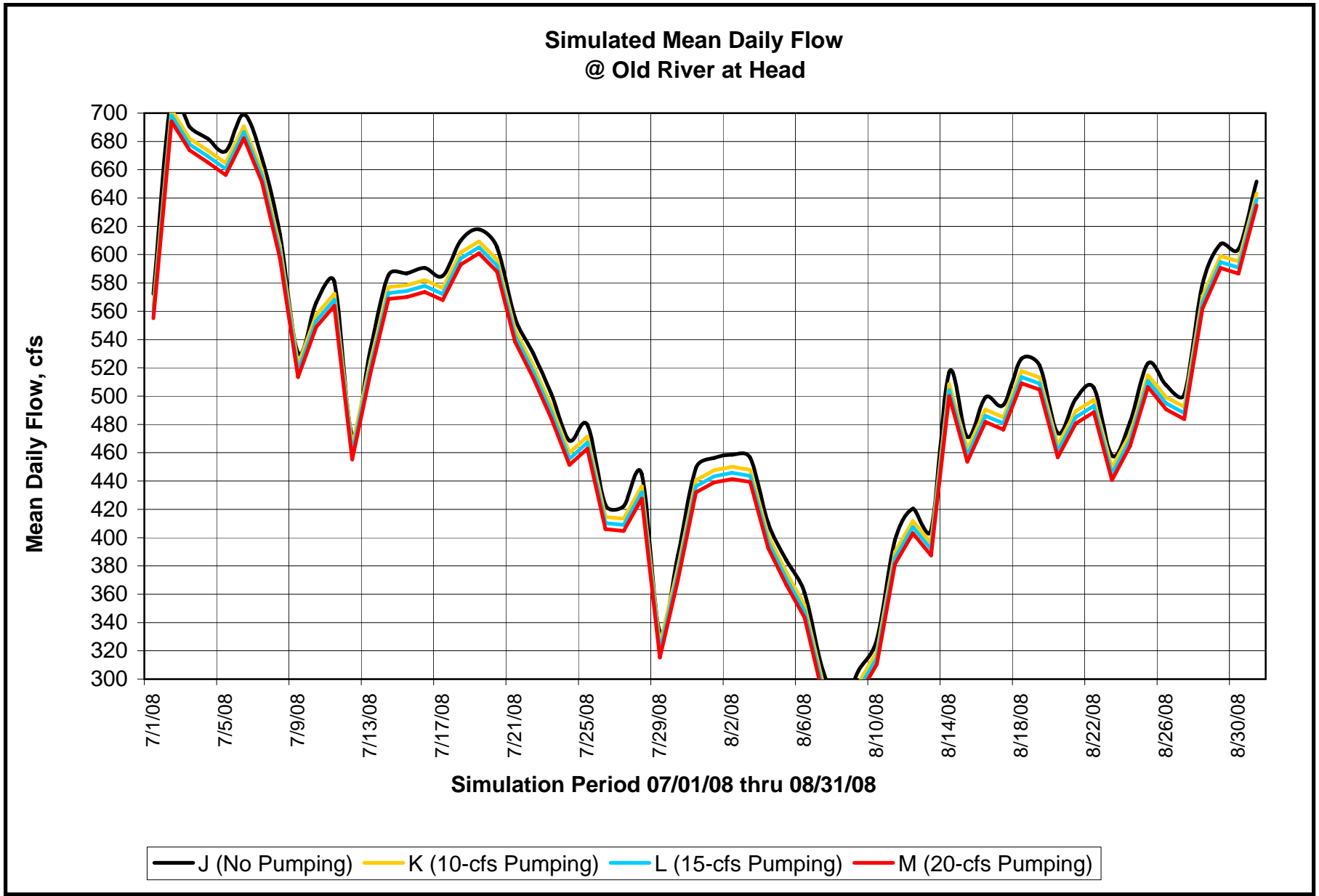
| DSM2 ID | Description |
|----------|---|
| RSAN087 | San Joaquin River @ Mossdale |
| RSAN072 | San Joaquin River near Brandt Bridge |
| ROLD074 | Old River @ Head |
| RMID041 | Middle River near Old River |
| ROLD059 | Old River @ Tracy Road |
| ROLD047 | Old River @ Delta Mendota Canal |
| 60_5875 | Old River upstream of Paradise Cut |
| 61_6003 | Old River downstream of Paradise Cut |
| 199_6662 | Paradise Cut just upstream of Old River |
| 198_7231 | Paradise Cut 20% upstream of Old River |
| 197_7205 | Paradise Cut mid upstream of Old River |
| 196_8526 | Paradise Cut 80% upstream of Old River |
| 195_3045 | Paradise Cut most upstream of Old River |

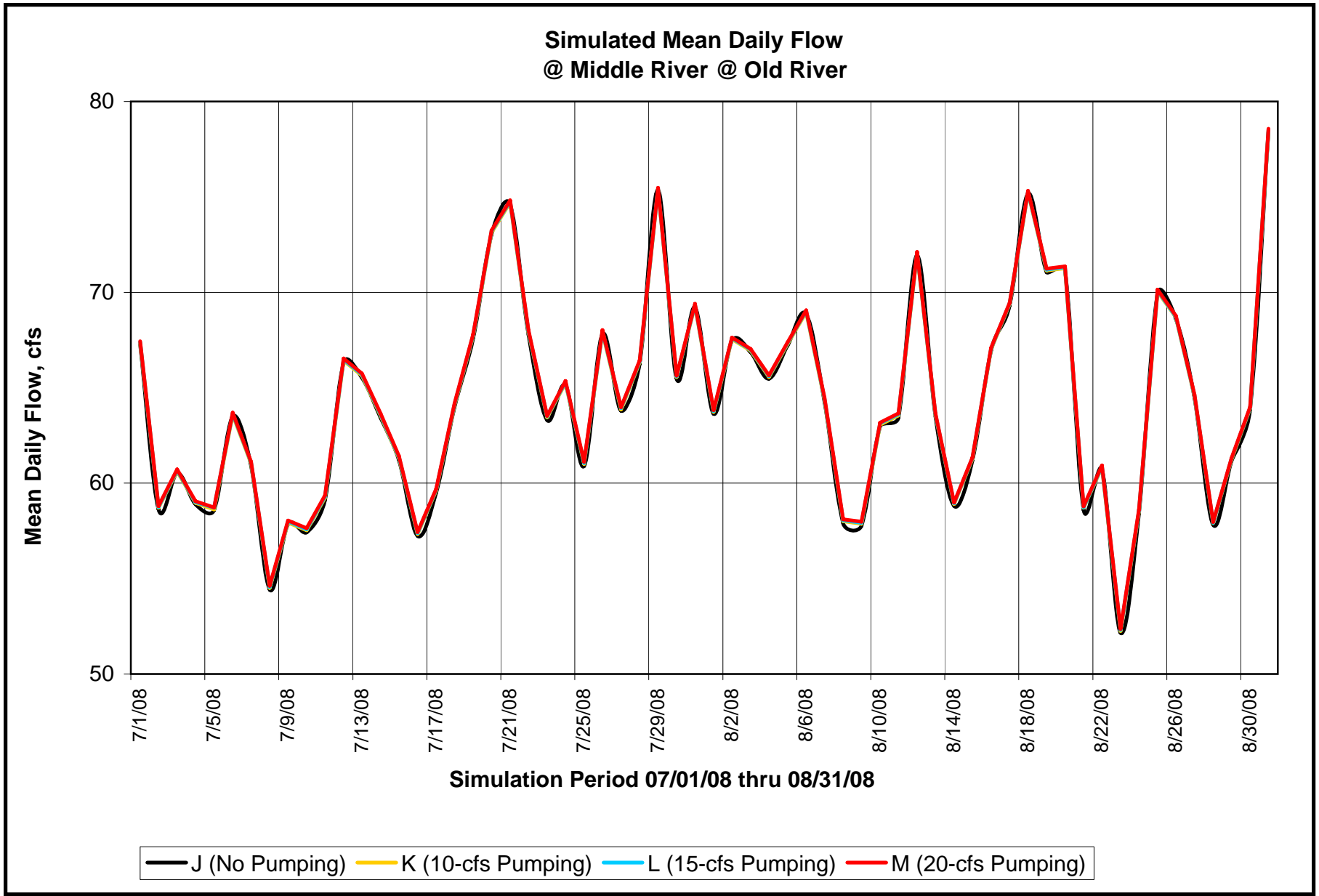


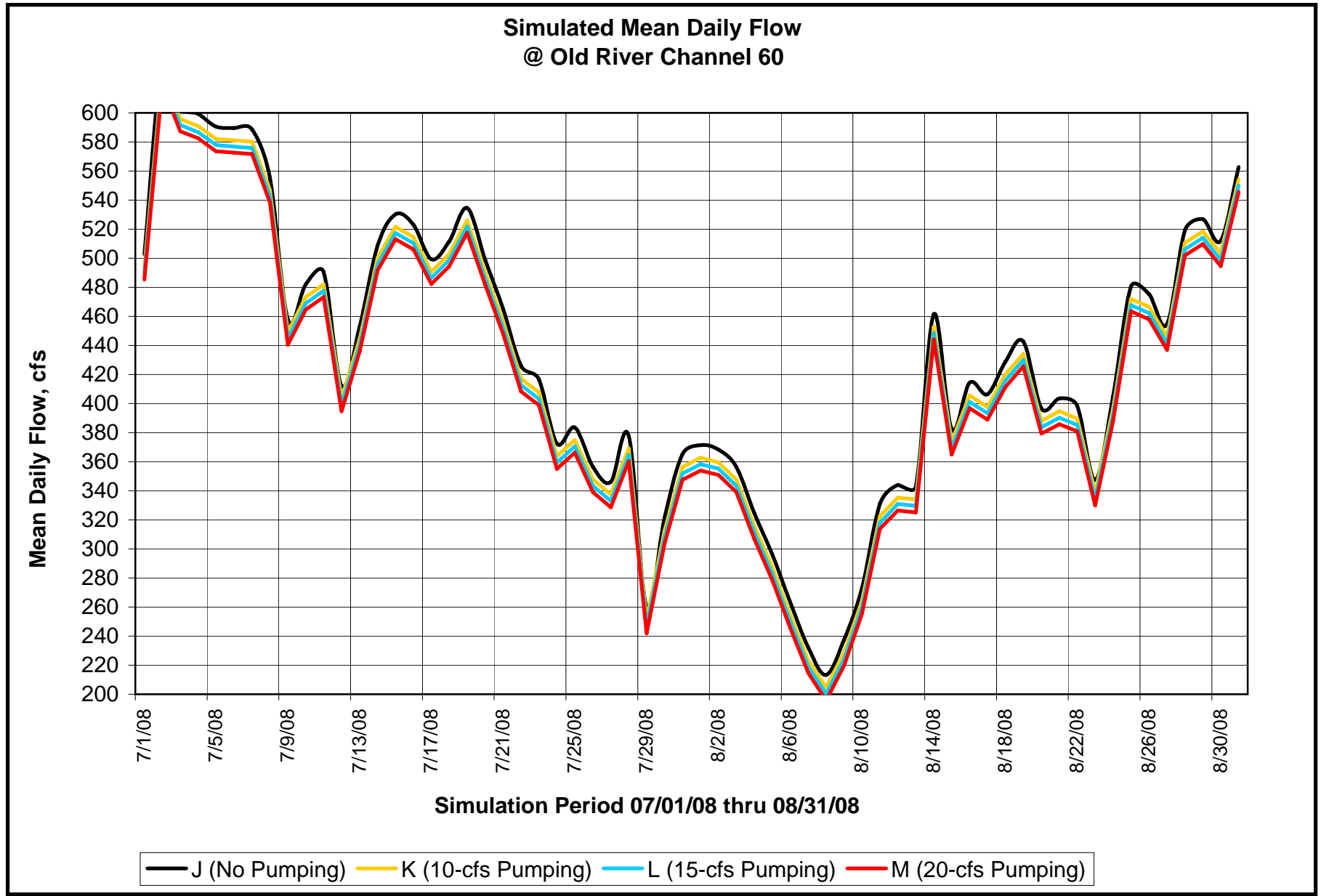
Simulated Mean Daily Flow @ San Joaquin River @ Mossdale

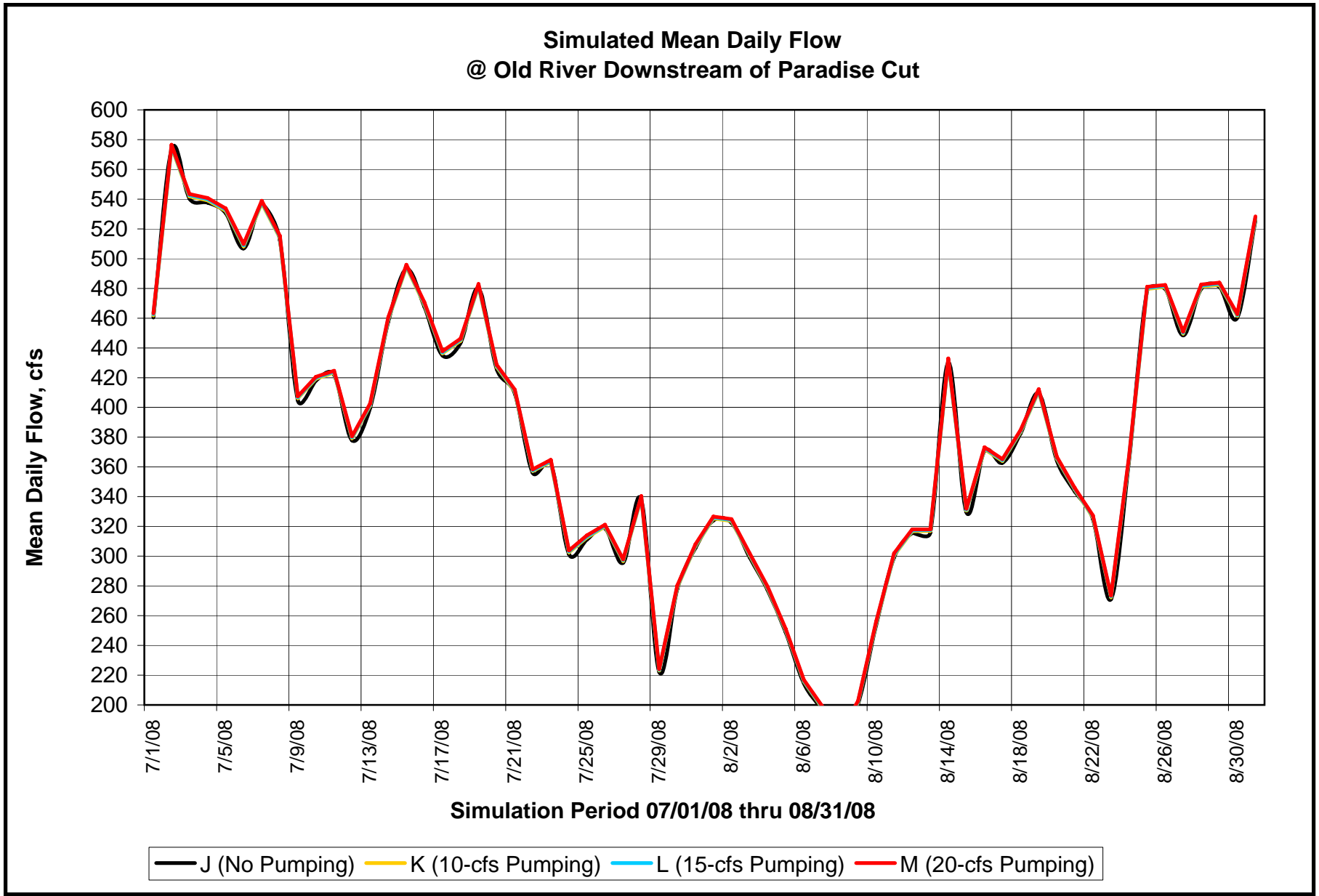


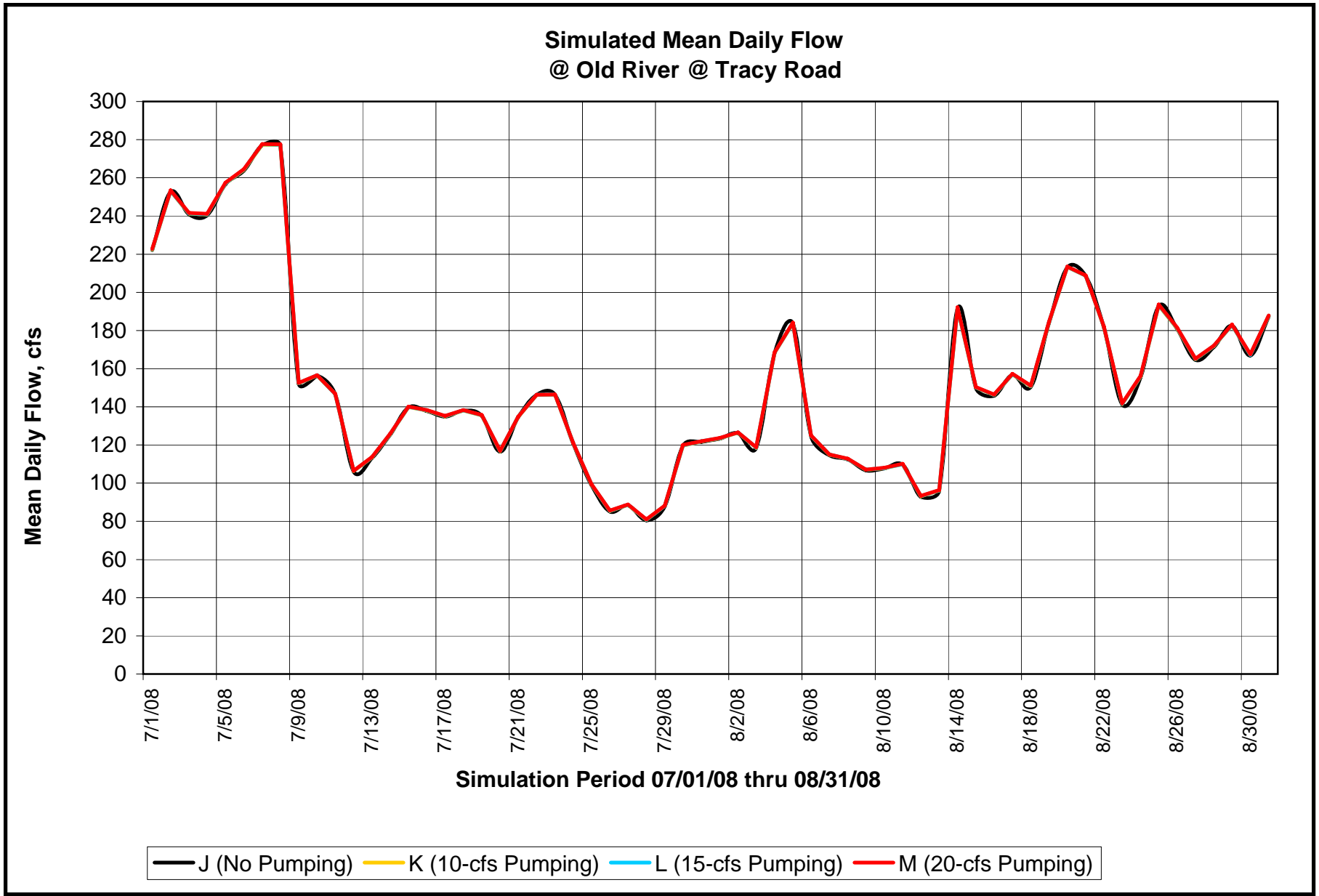


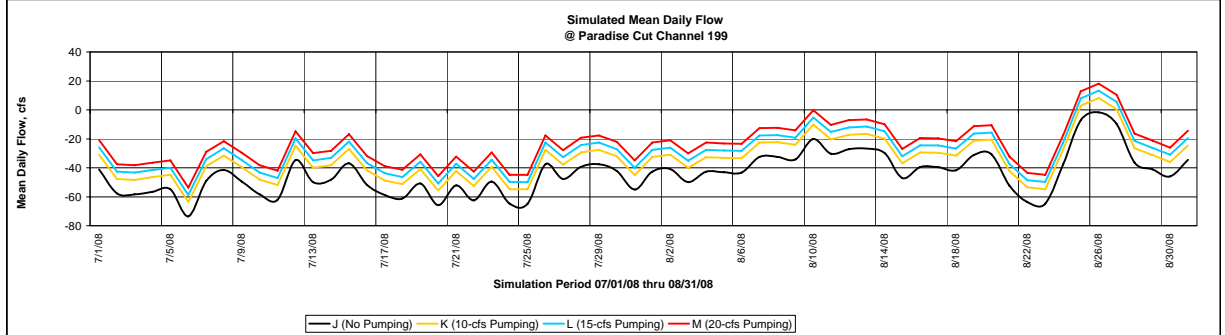
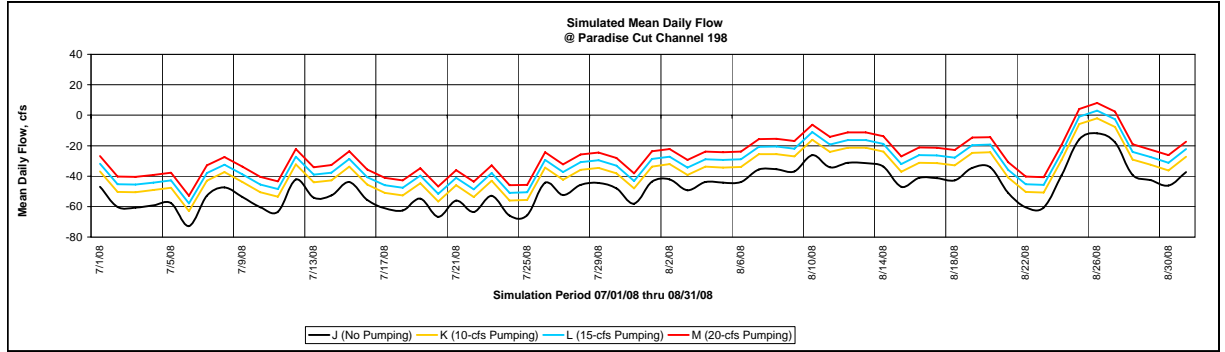
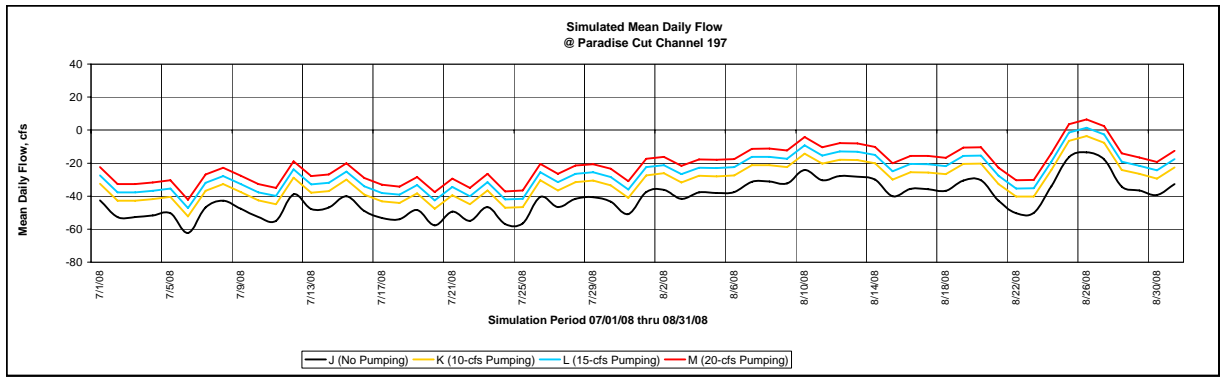
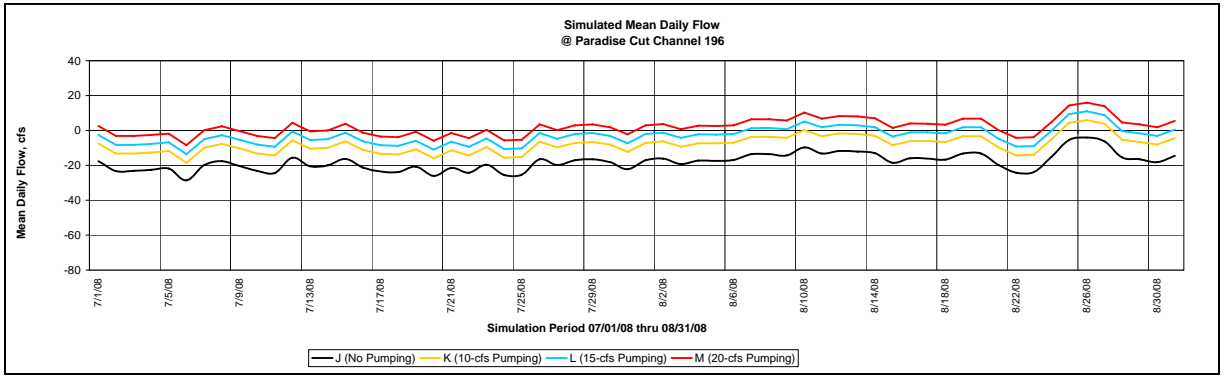
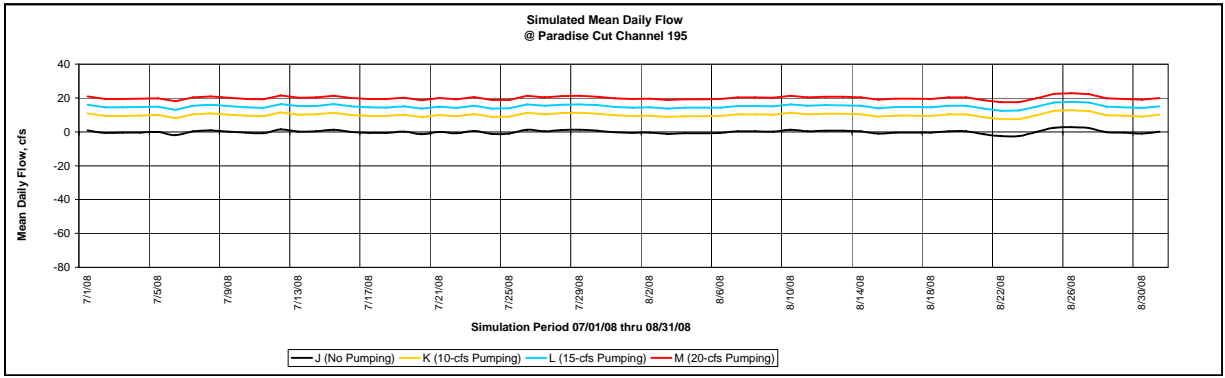


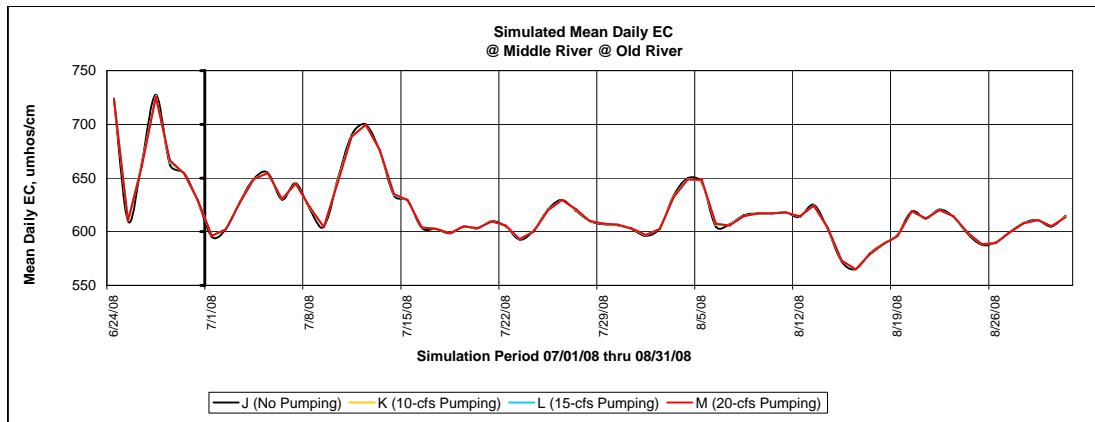
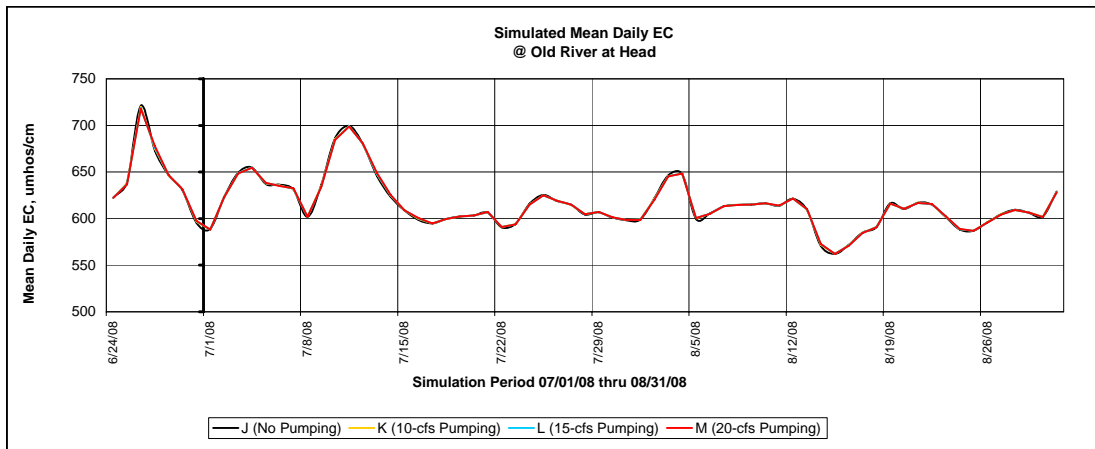
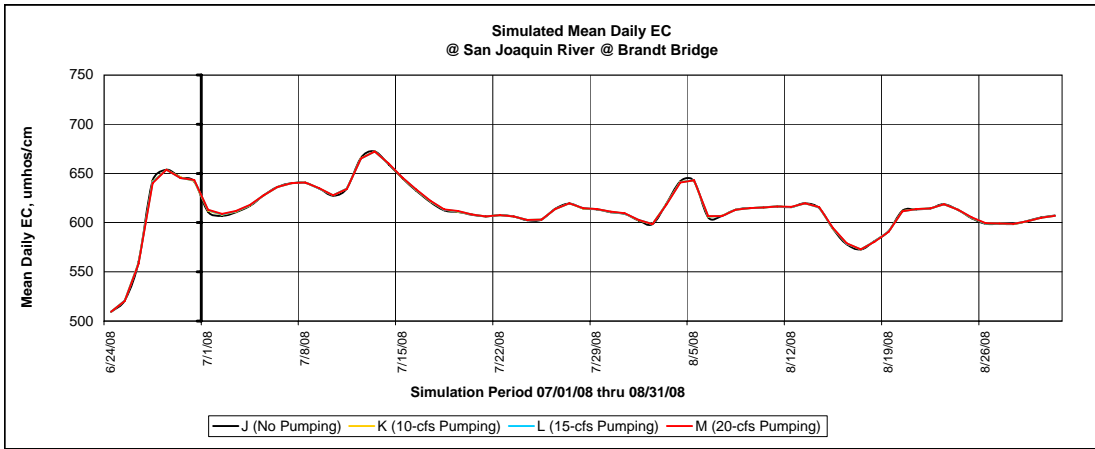
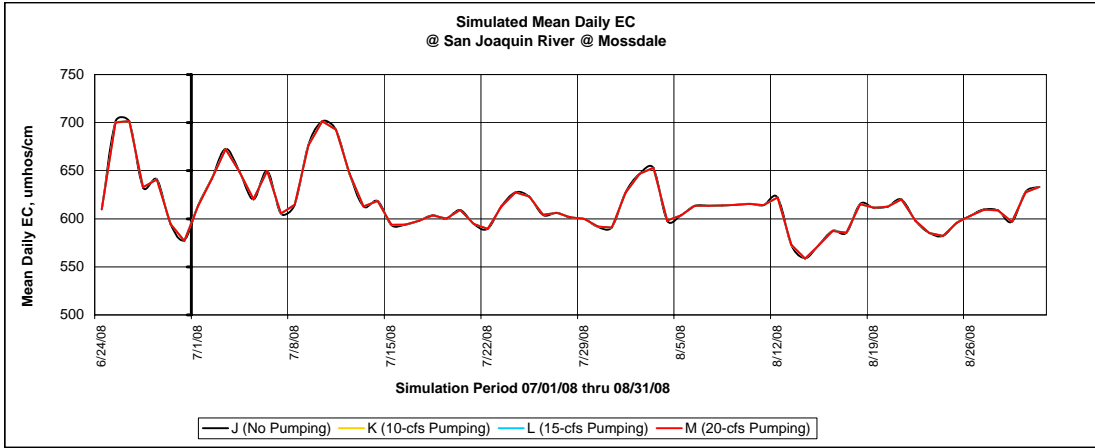


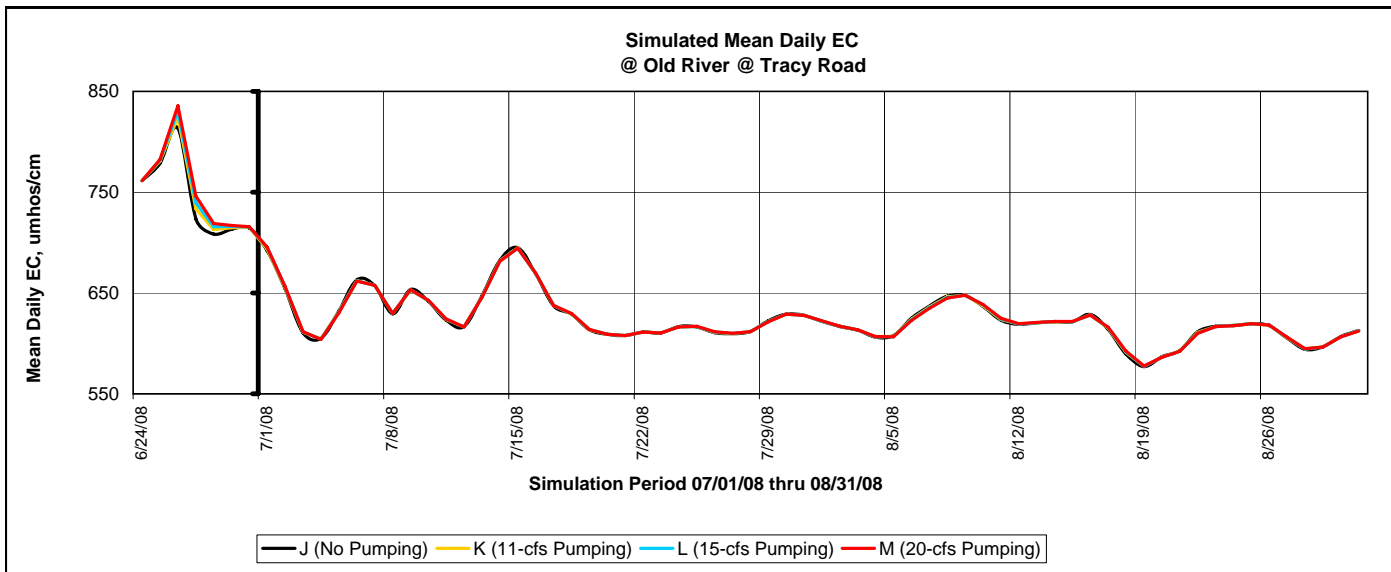
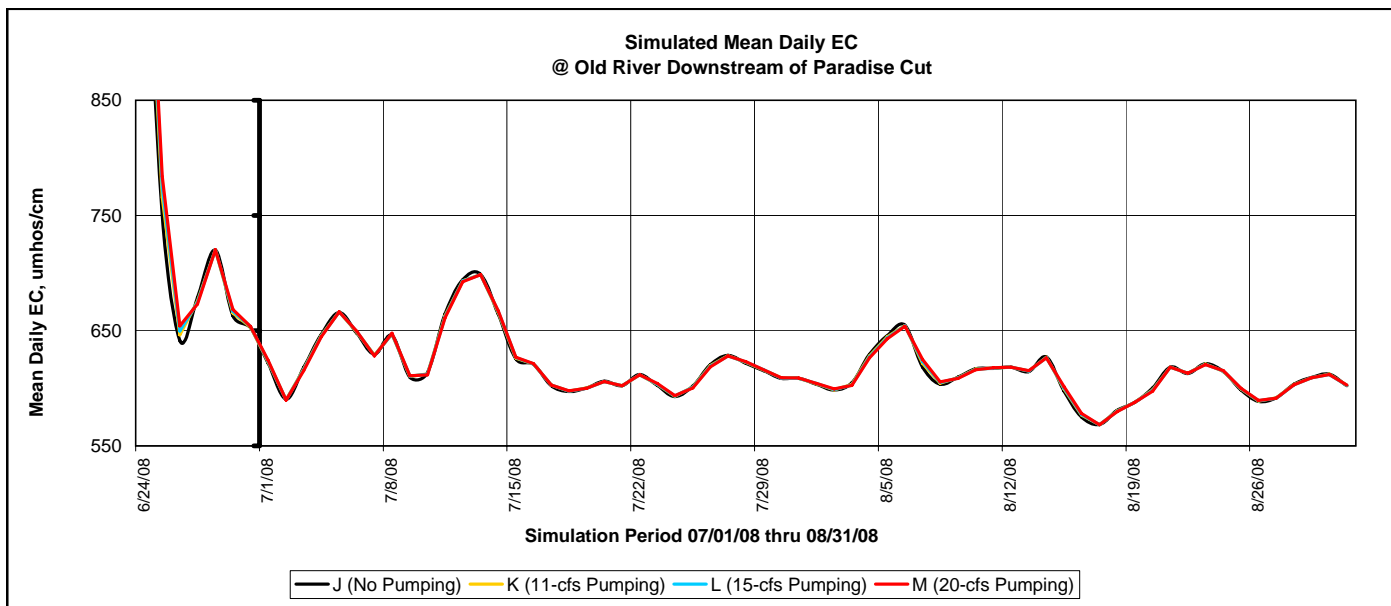
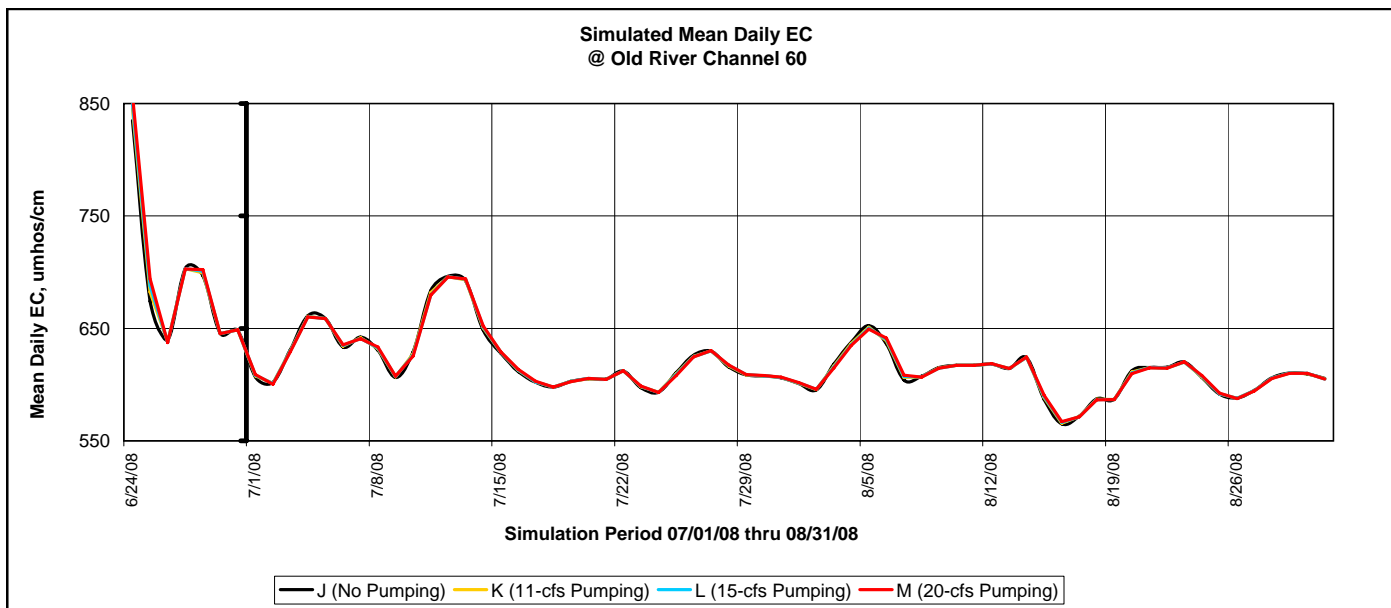


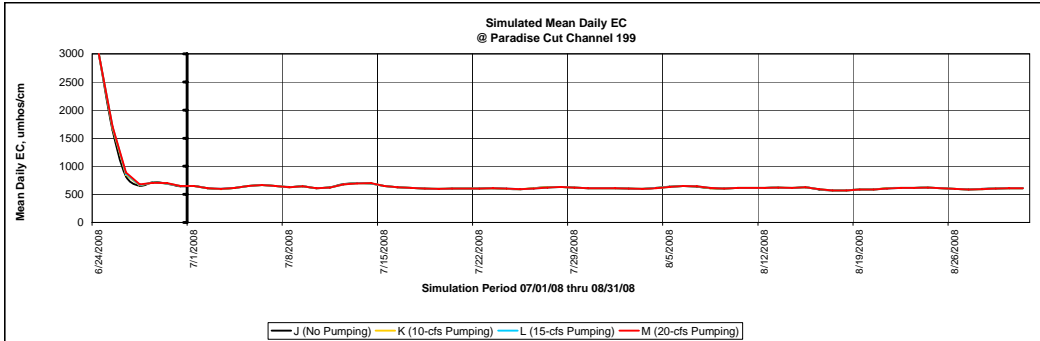
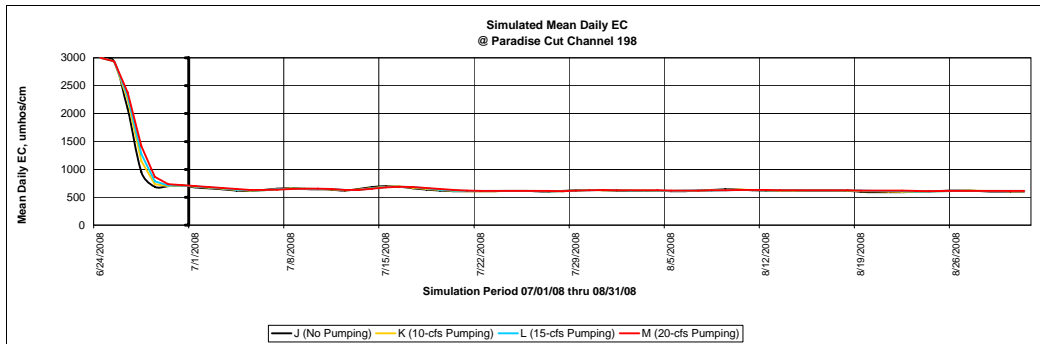
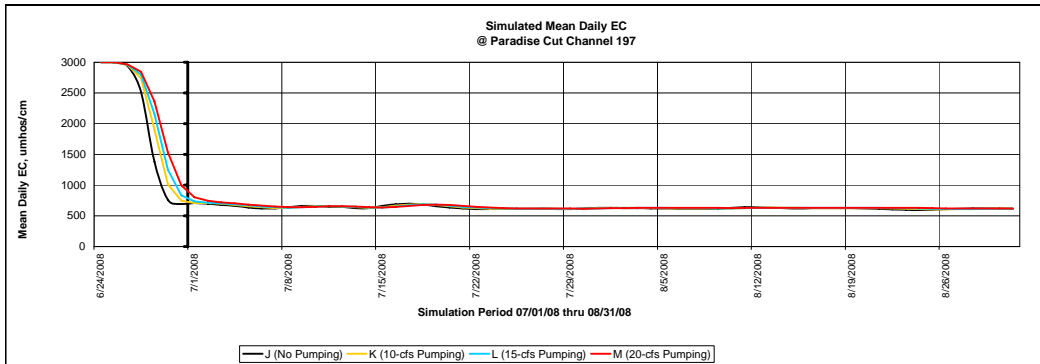
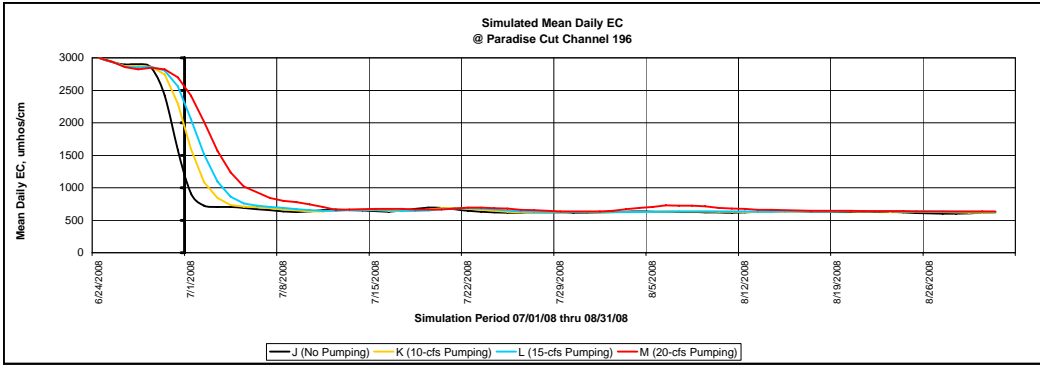
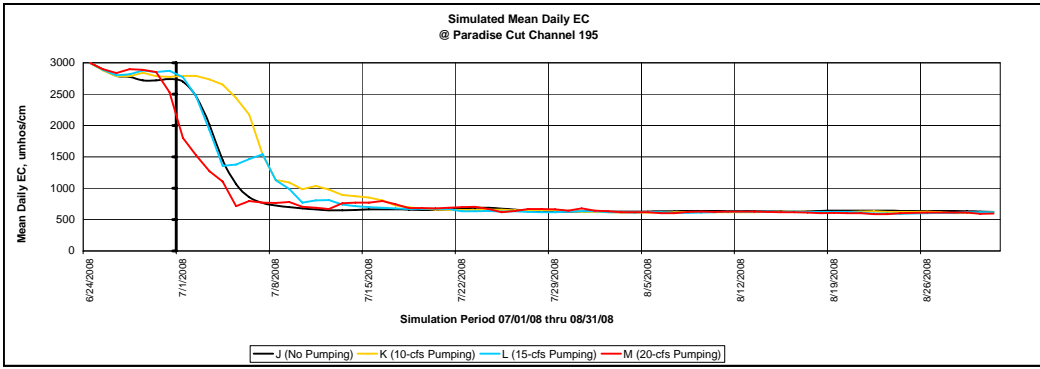


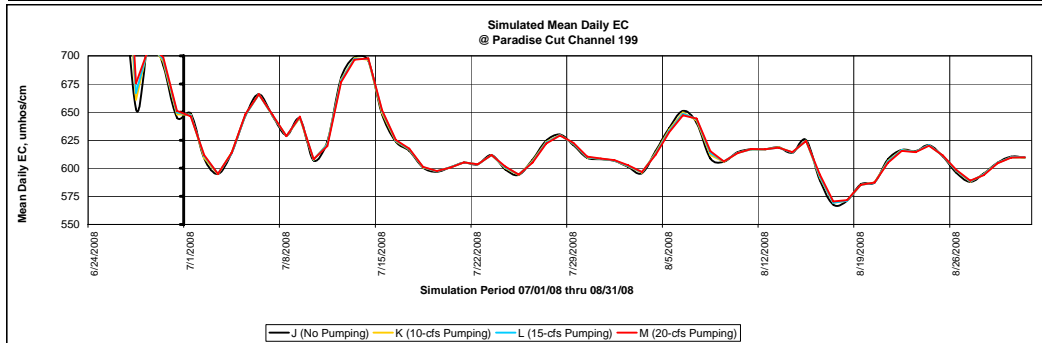
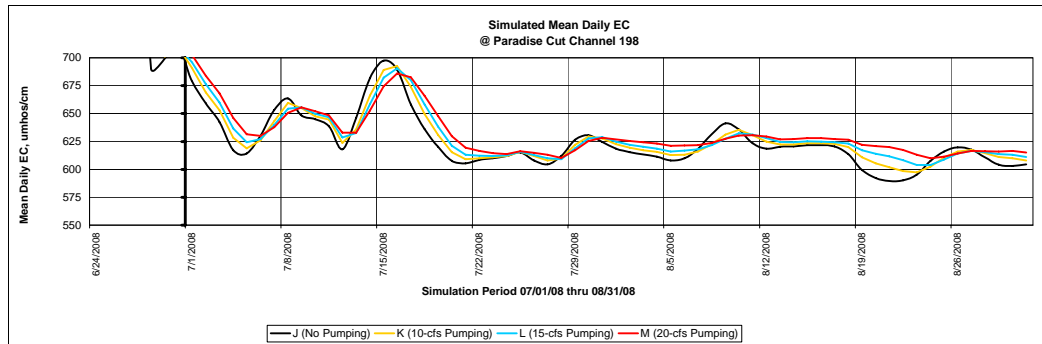
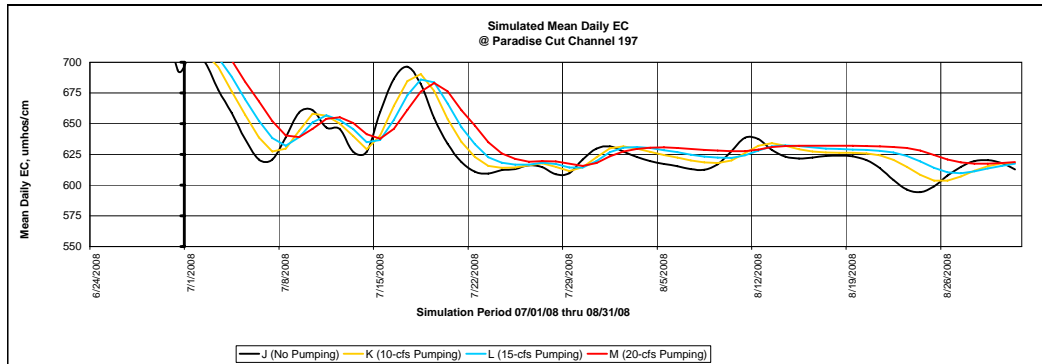
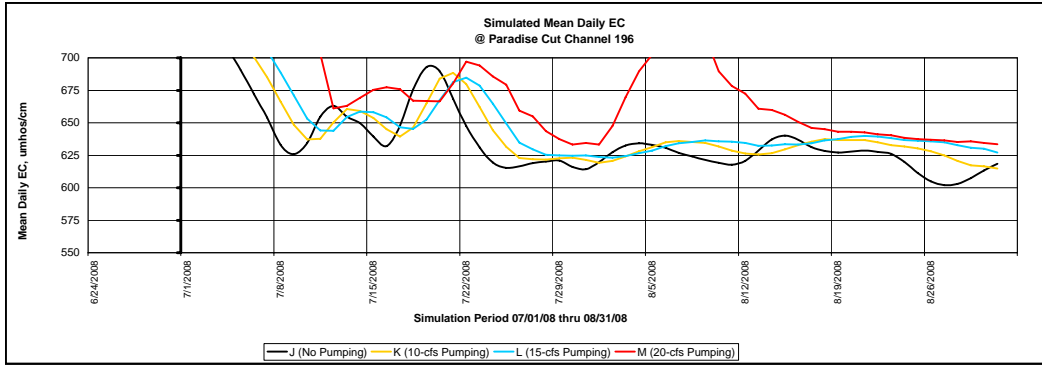
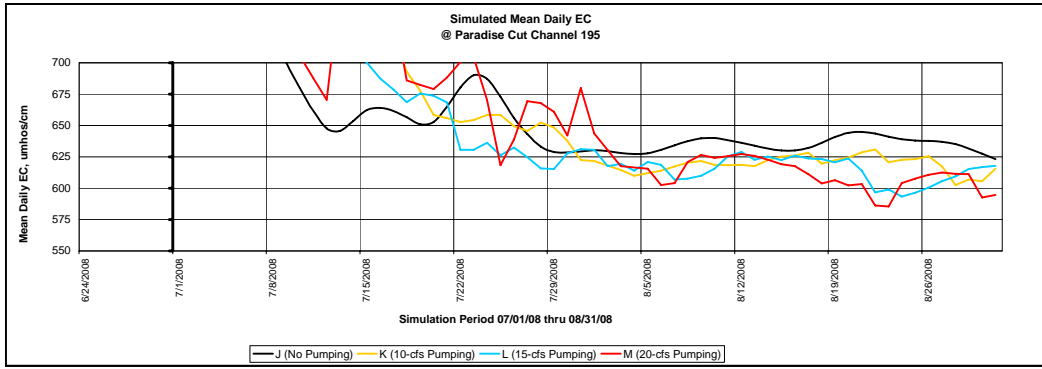






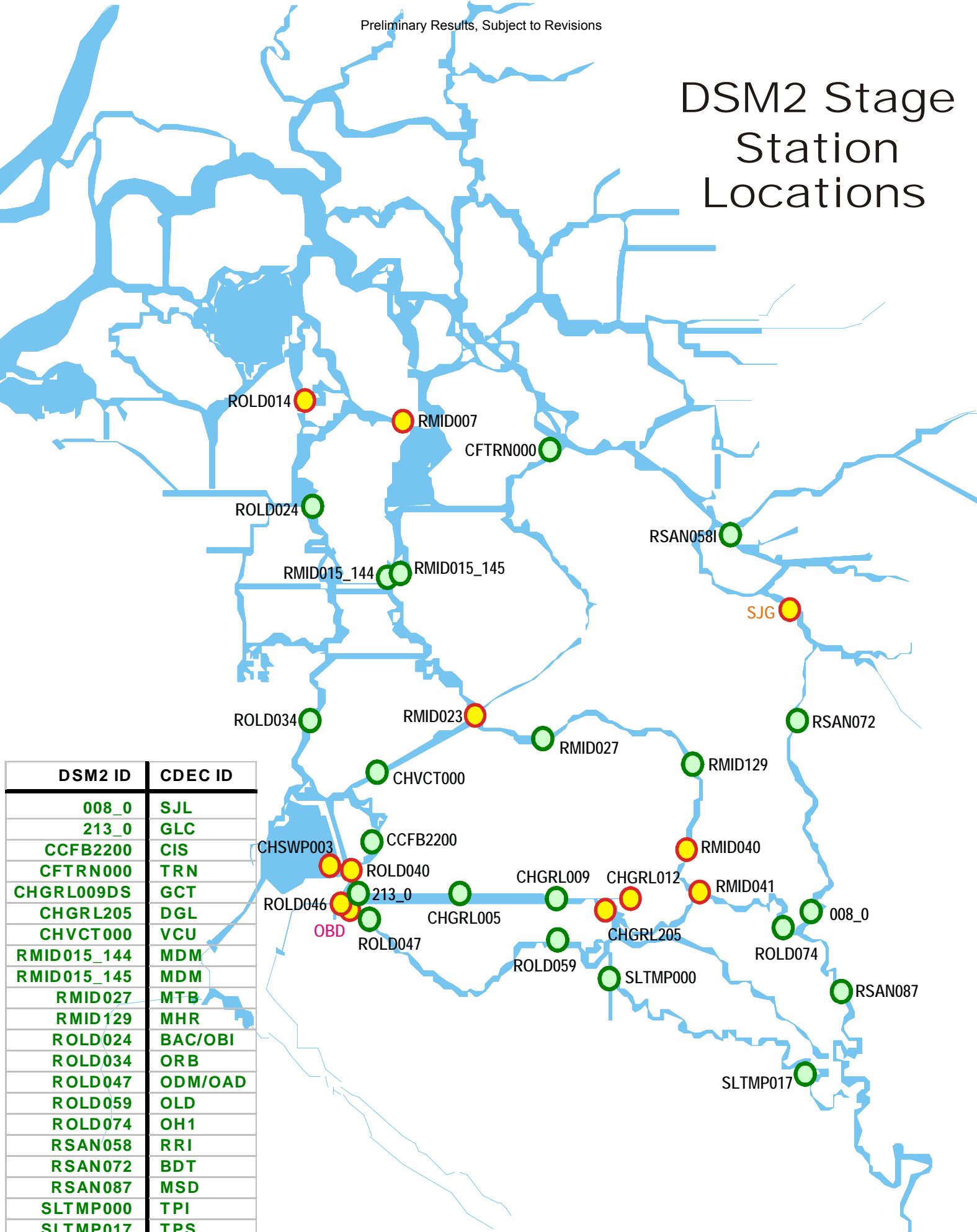






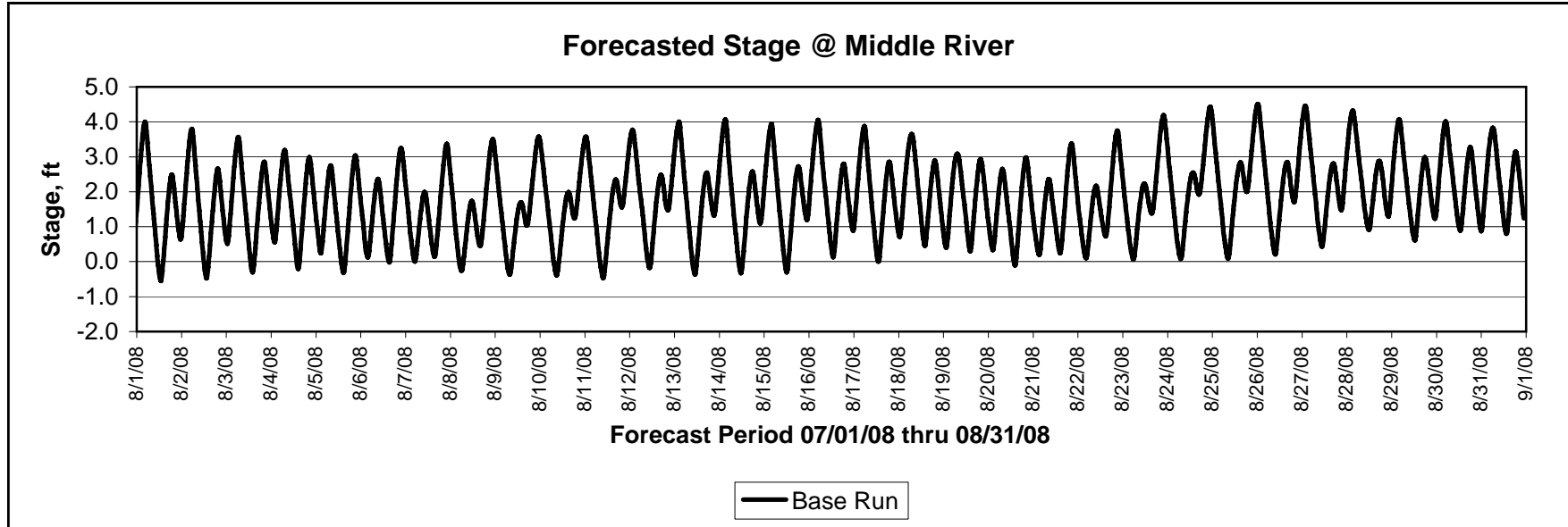
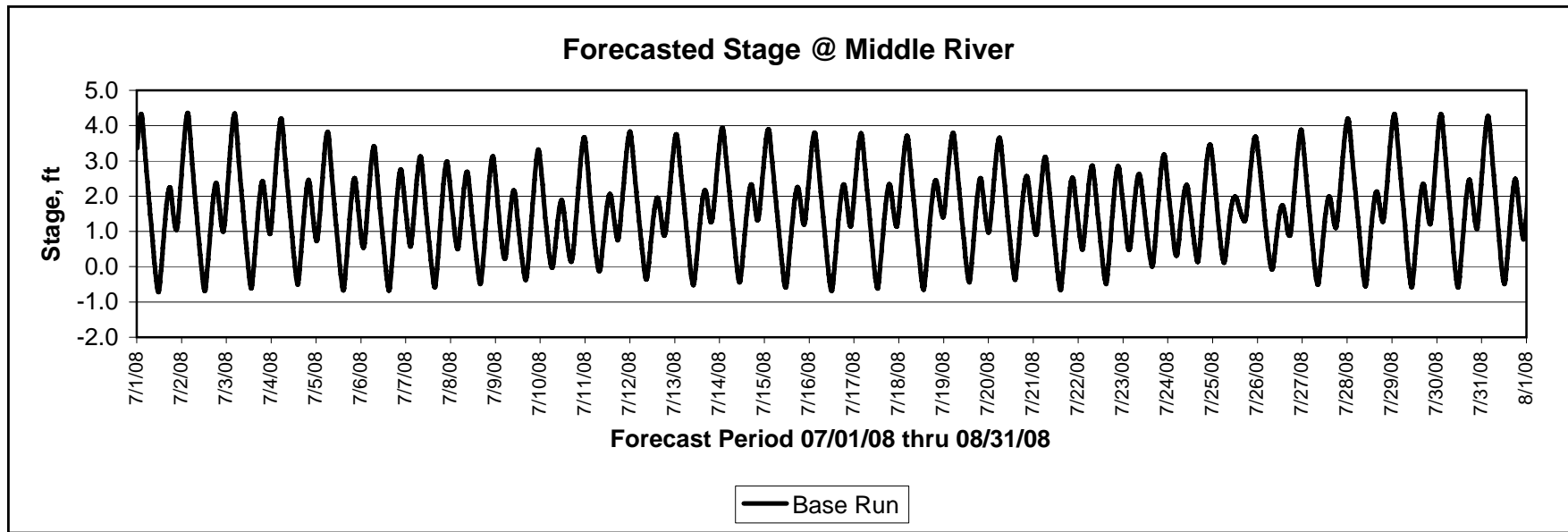
**COMPARISON OF BASELINE &
HISTORICAL STAGE
(15-MINUTE)**

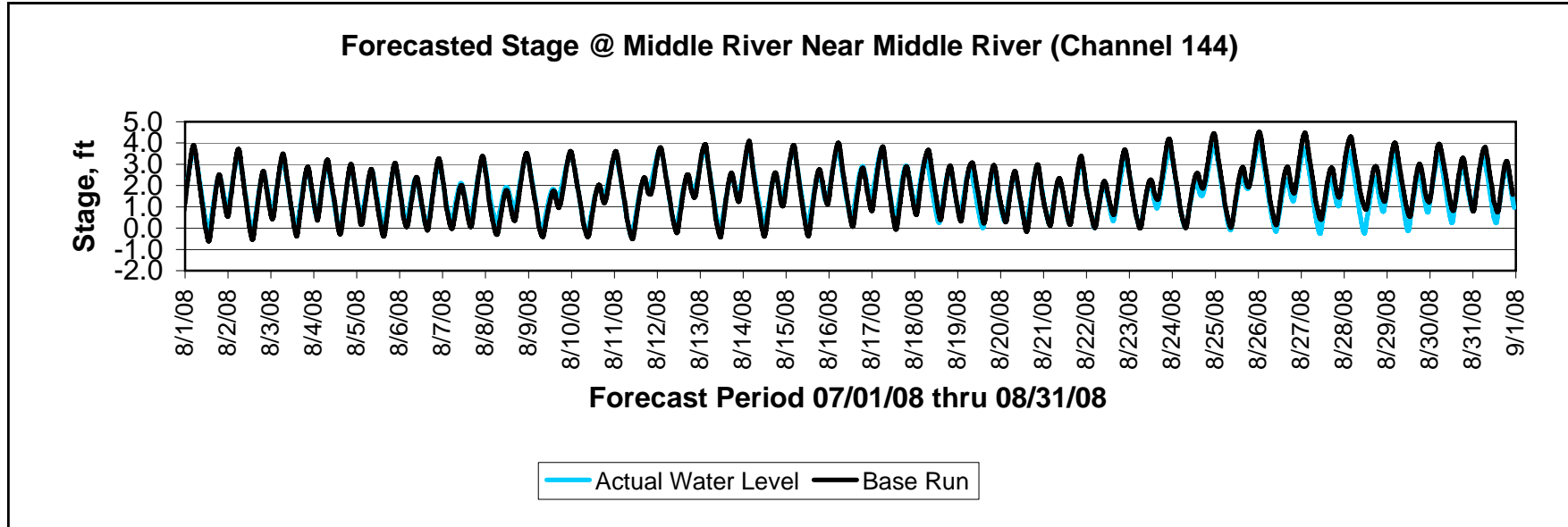
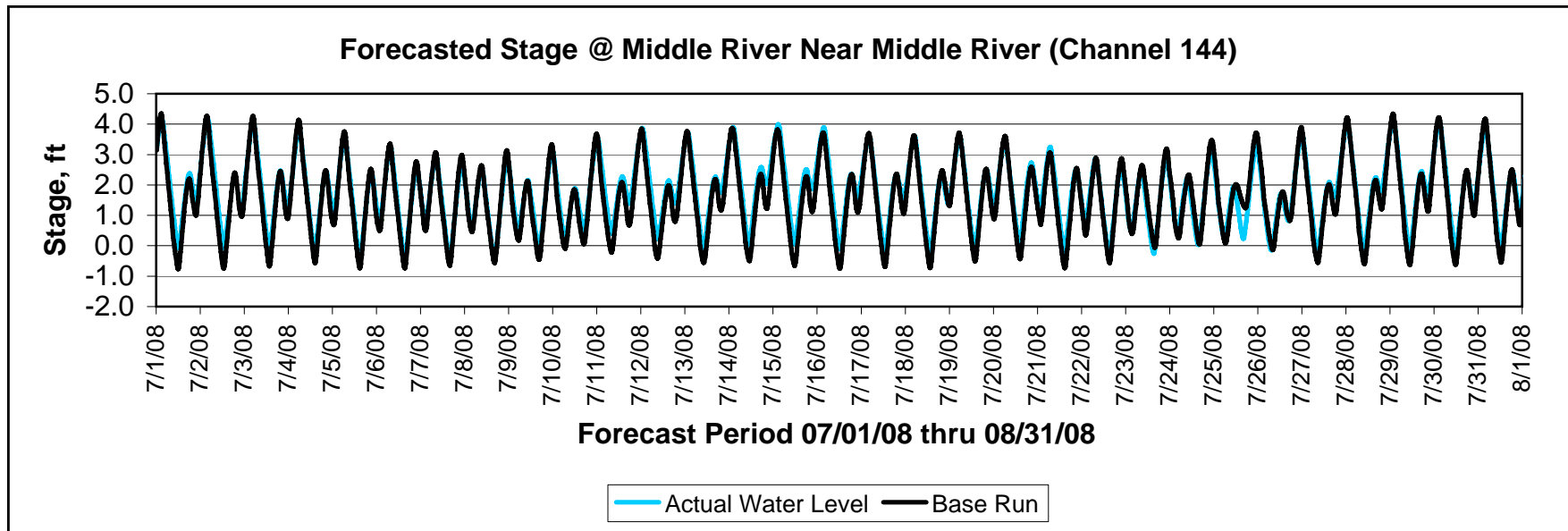
DSM2 Stage Station Locations

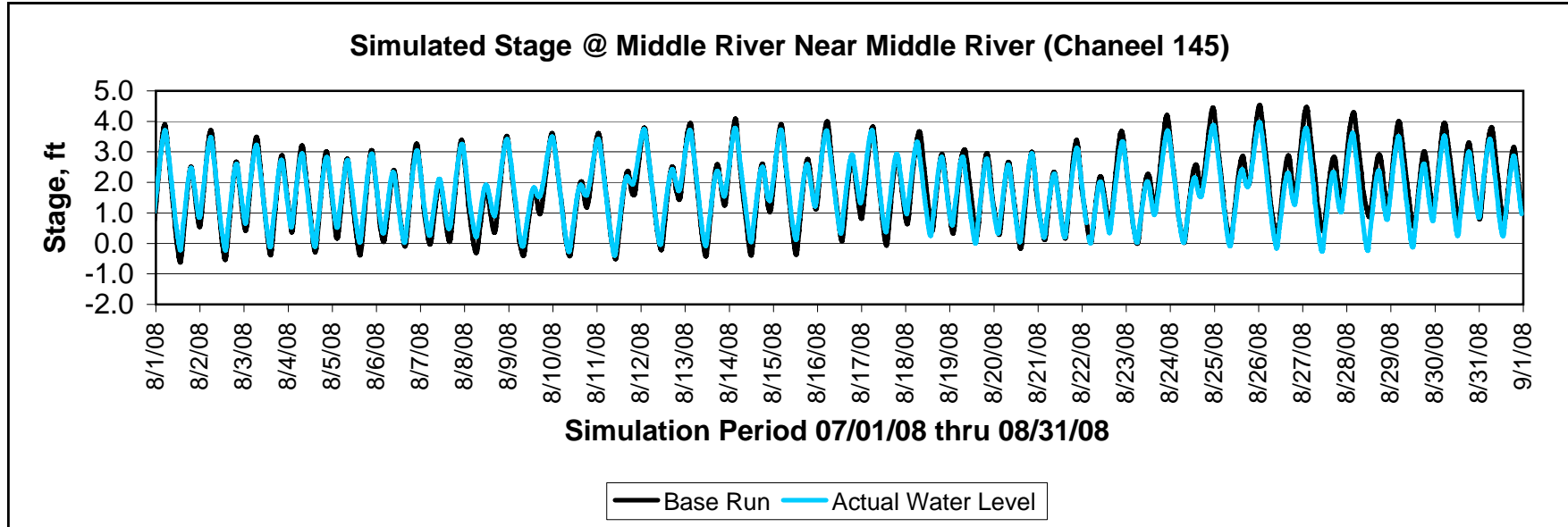
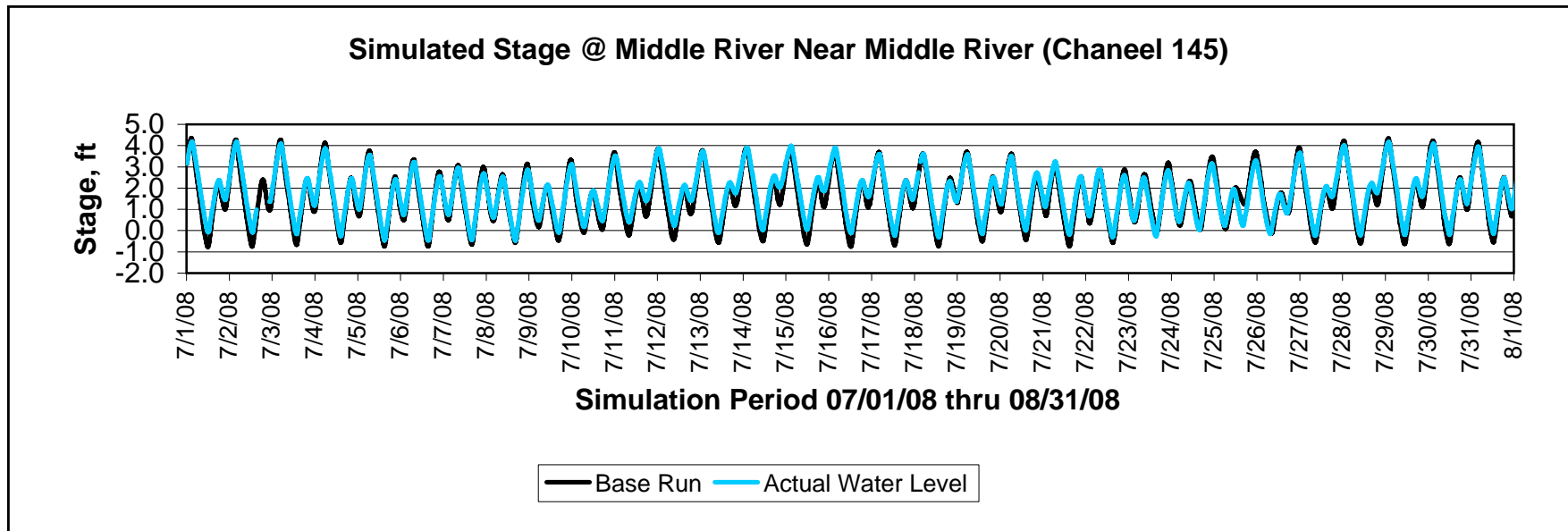


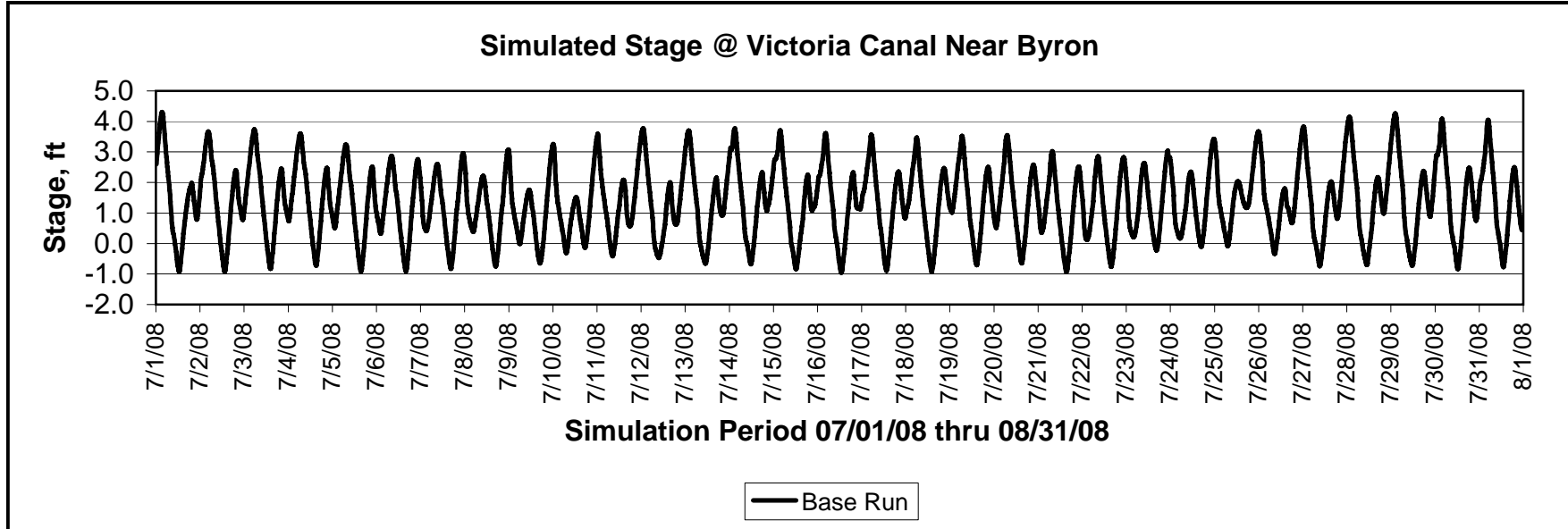
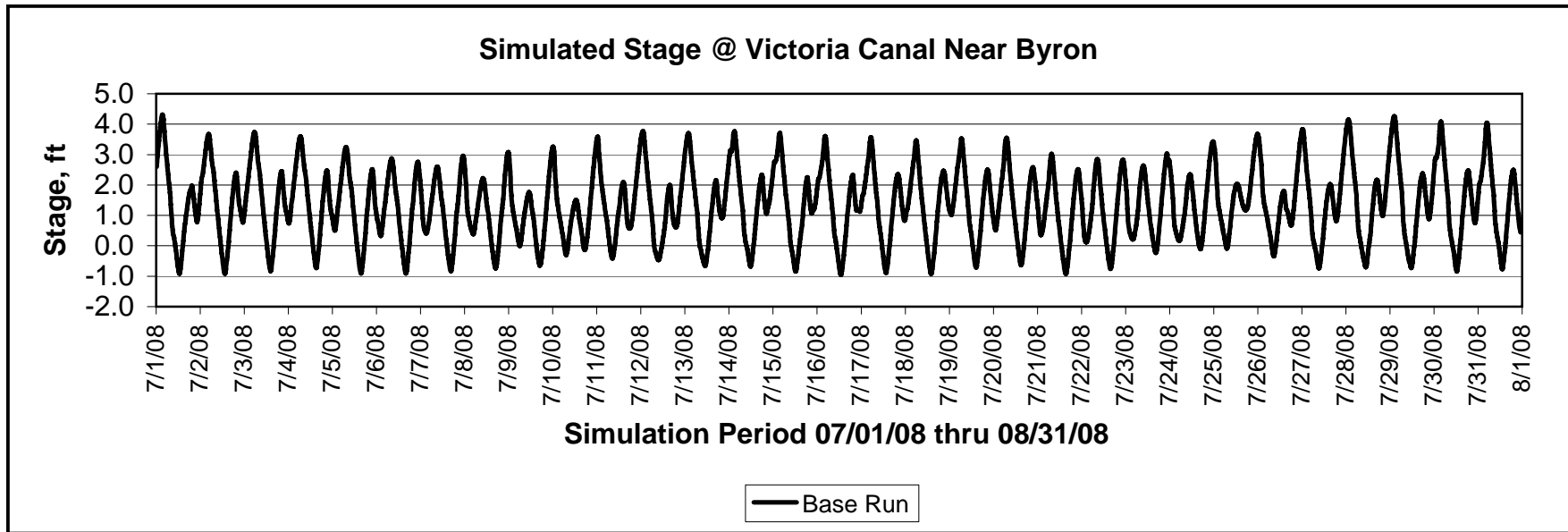
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|-------------|---------|
| 008_0 | SJL |
| 213_0 | GLC |
| CCFB2200 | CIS |
| CFTRN000 | TRN |
| CHGRL009DS | GCT |
| CHGRL205 | DGL |
| CHVCT000 | VCU |
| RMID015_144 | MDM |
| RMID015_145 | MDM |
| RMID027 | MTB |
| RMID129 | MHR |
| ROLD024 | BAC/OBI |
| ROLD034 | ORB |
| ROLD047 | ODM/OAD |
| ROLD059 | OLD |
| ROLD074 | OH1 |
| RSAN058 | RRI |
| RSAN072 | BDT |
| RSAN087 | MSD |
| SLTMP000 | TPI |
| SLTMP017 | TPS |

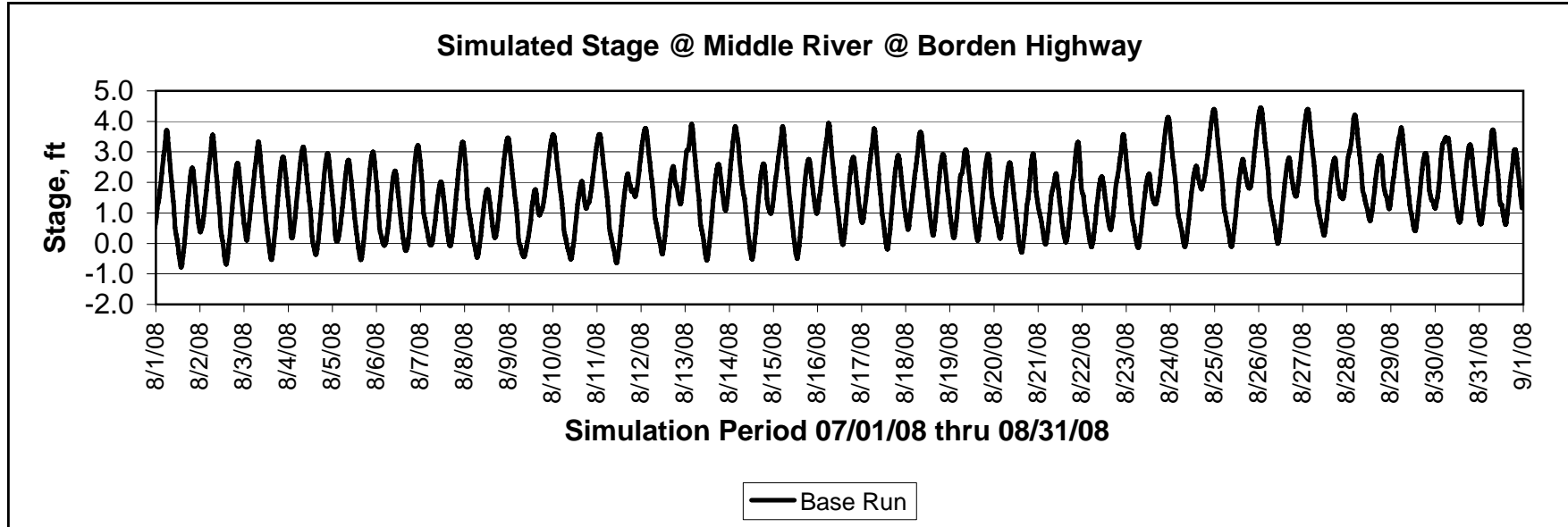
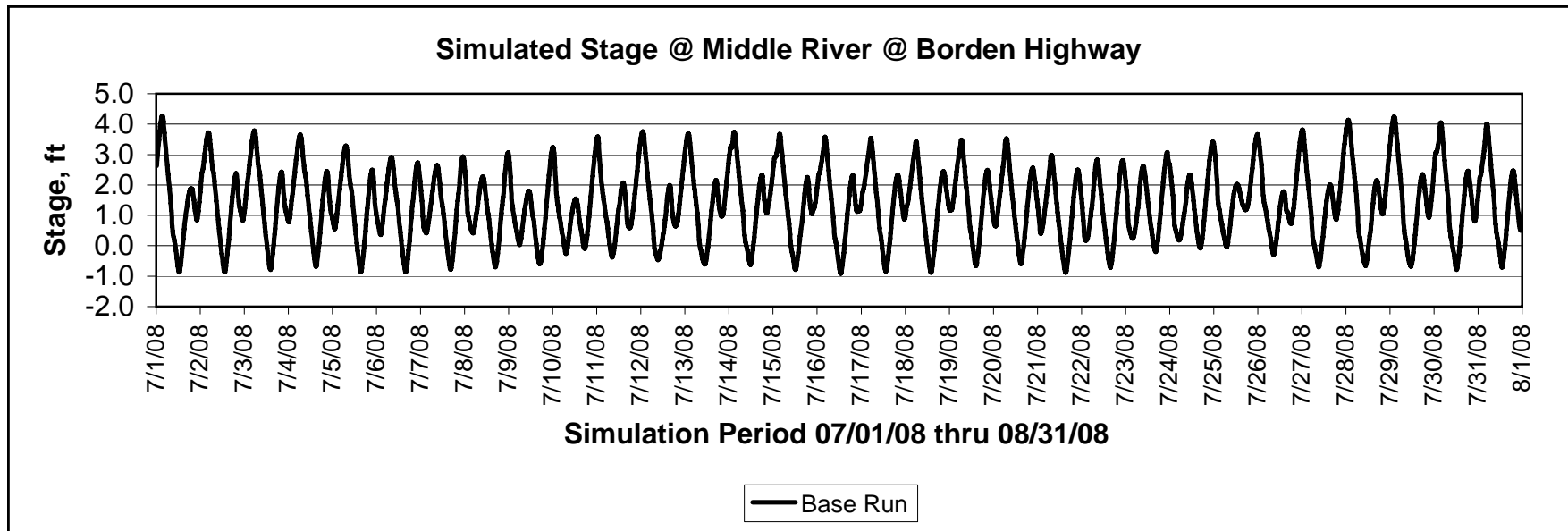
MIDDLE RIVER - STAGE

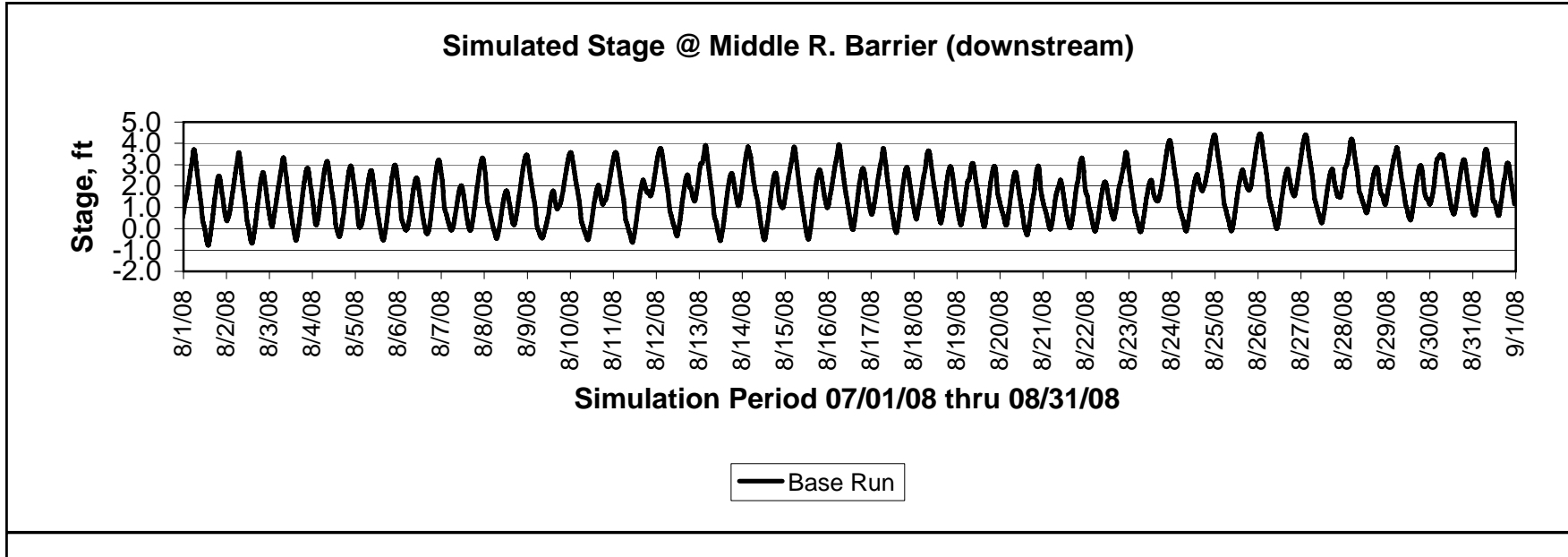
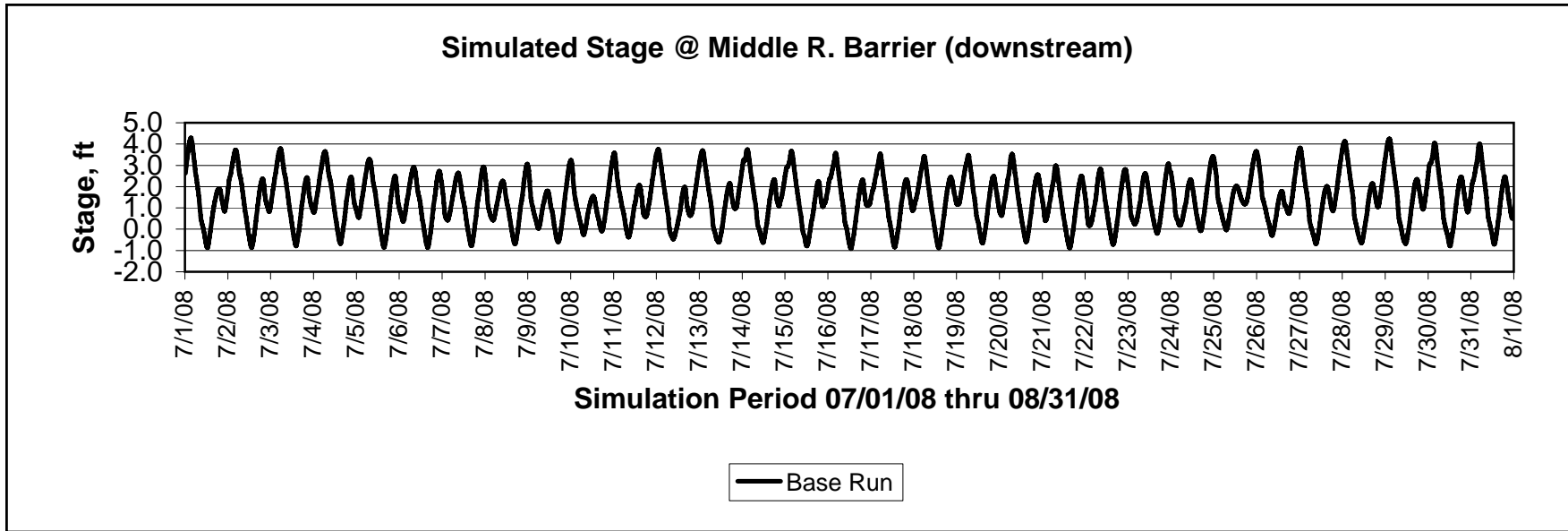


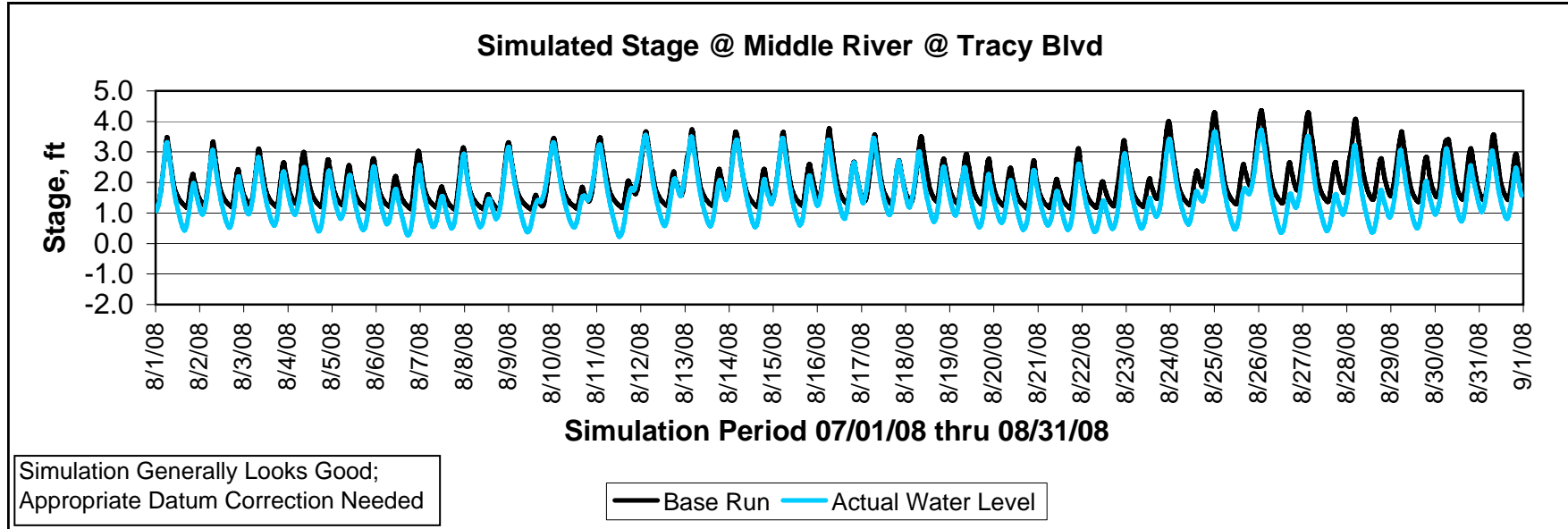
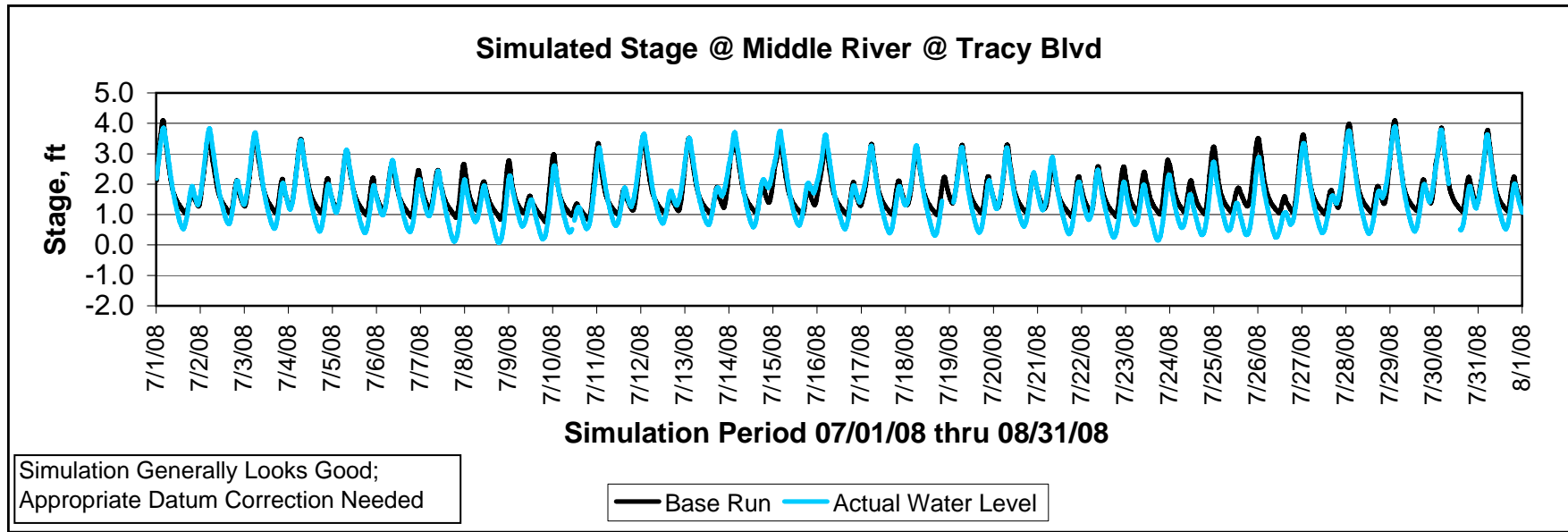


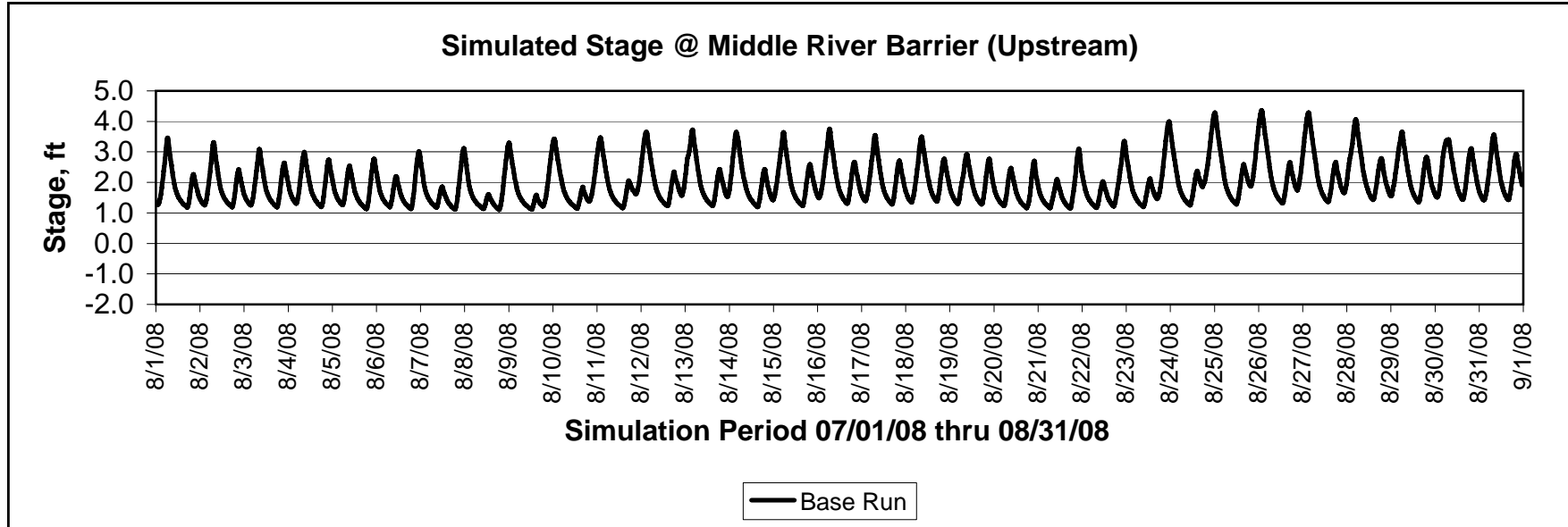
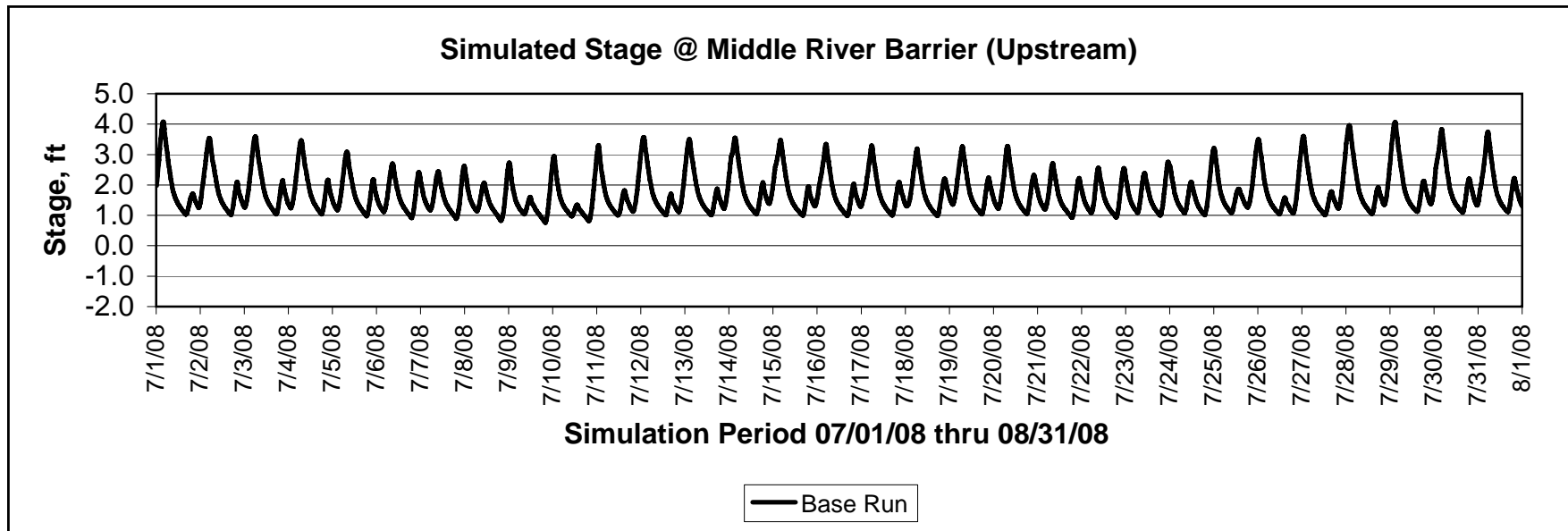


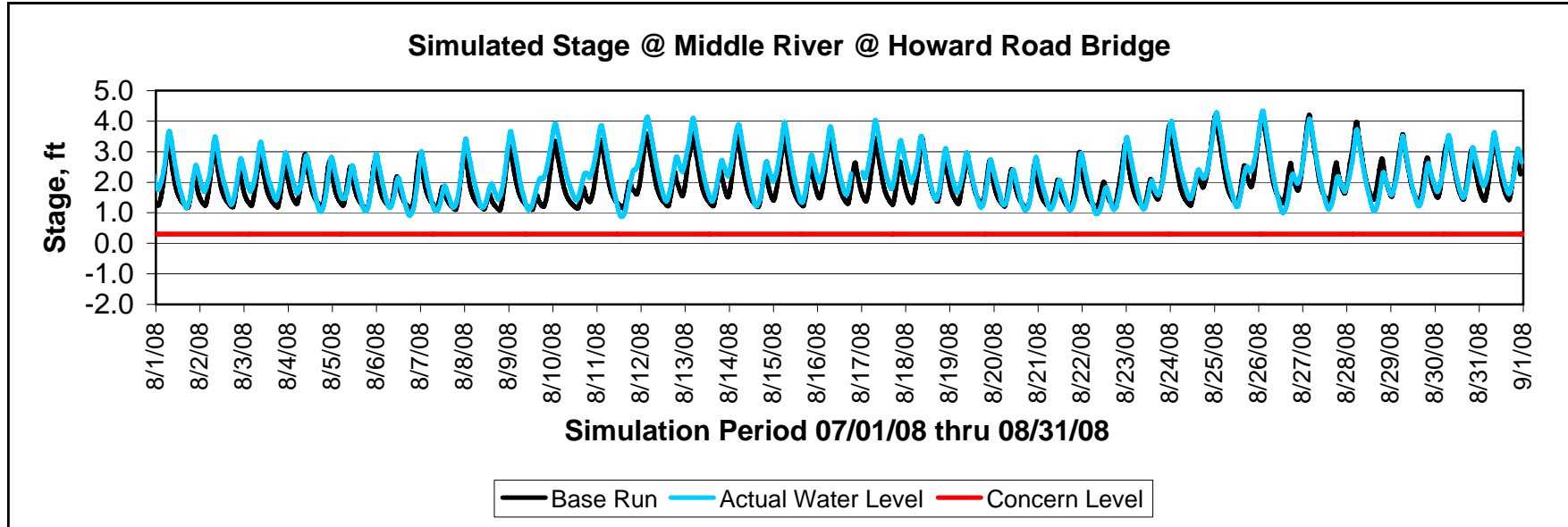
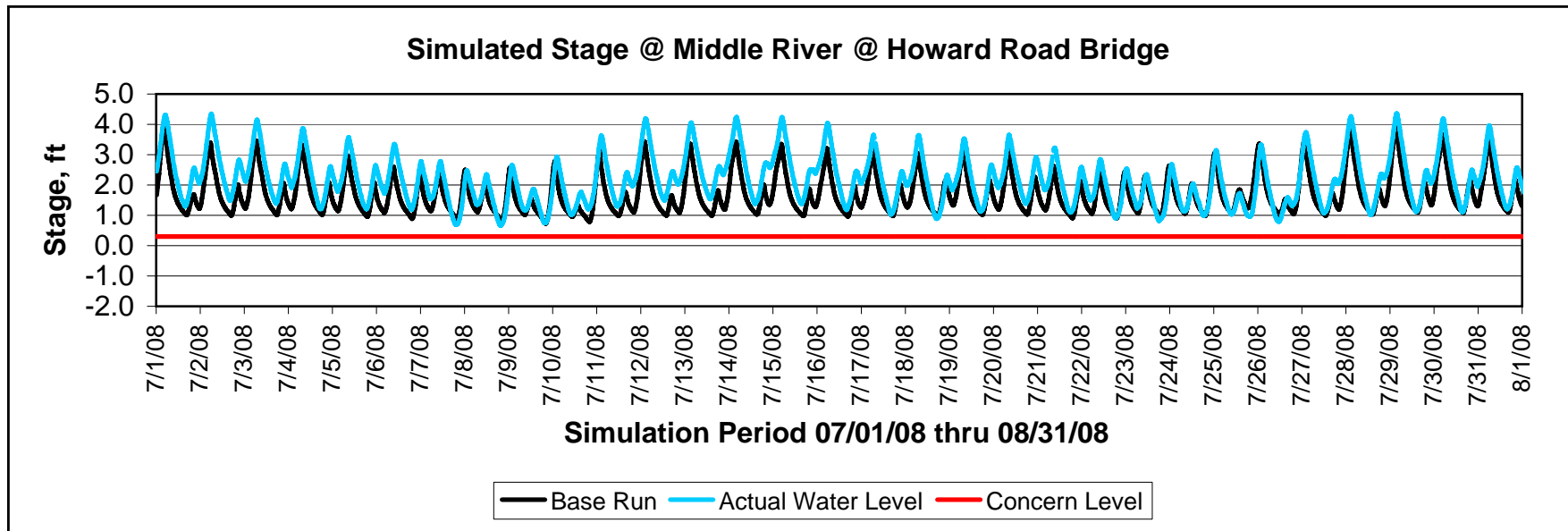


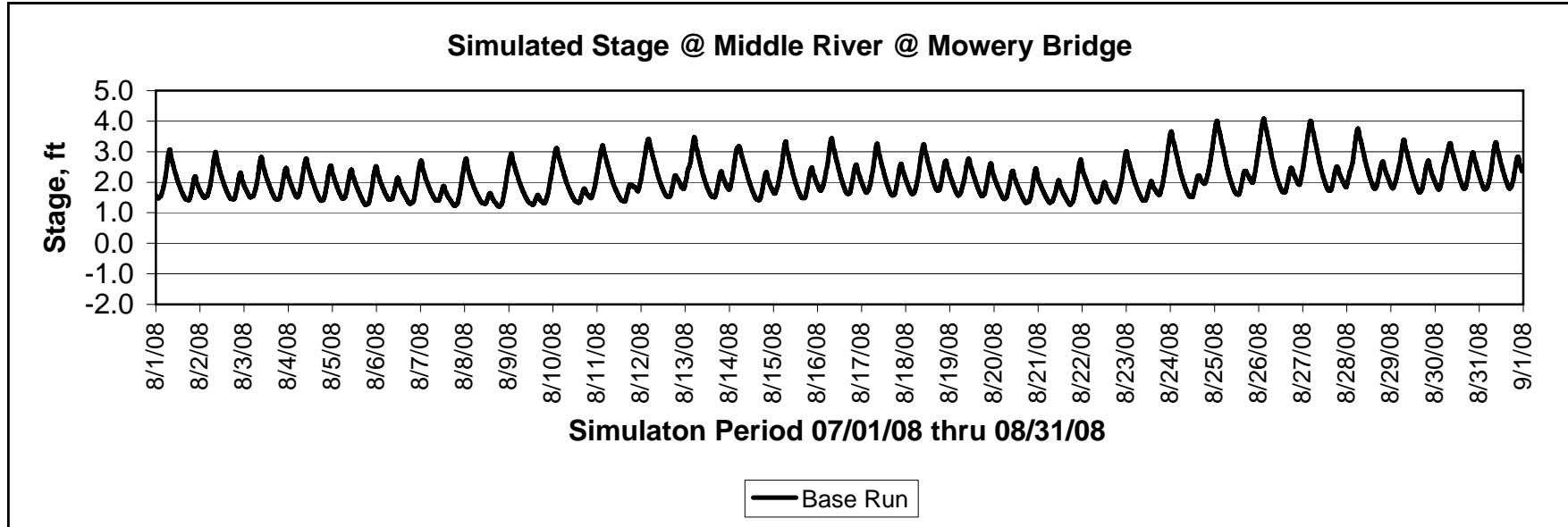
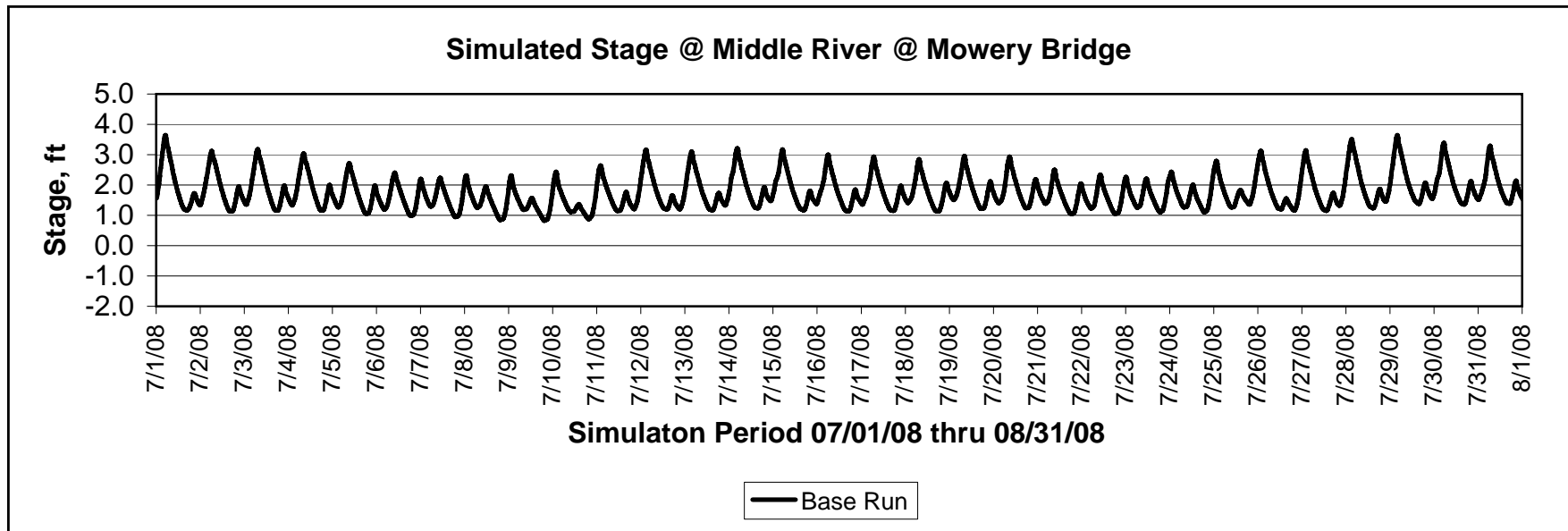


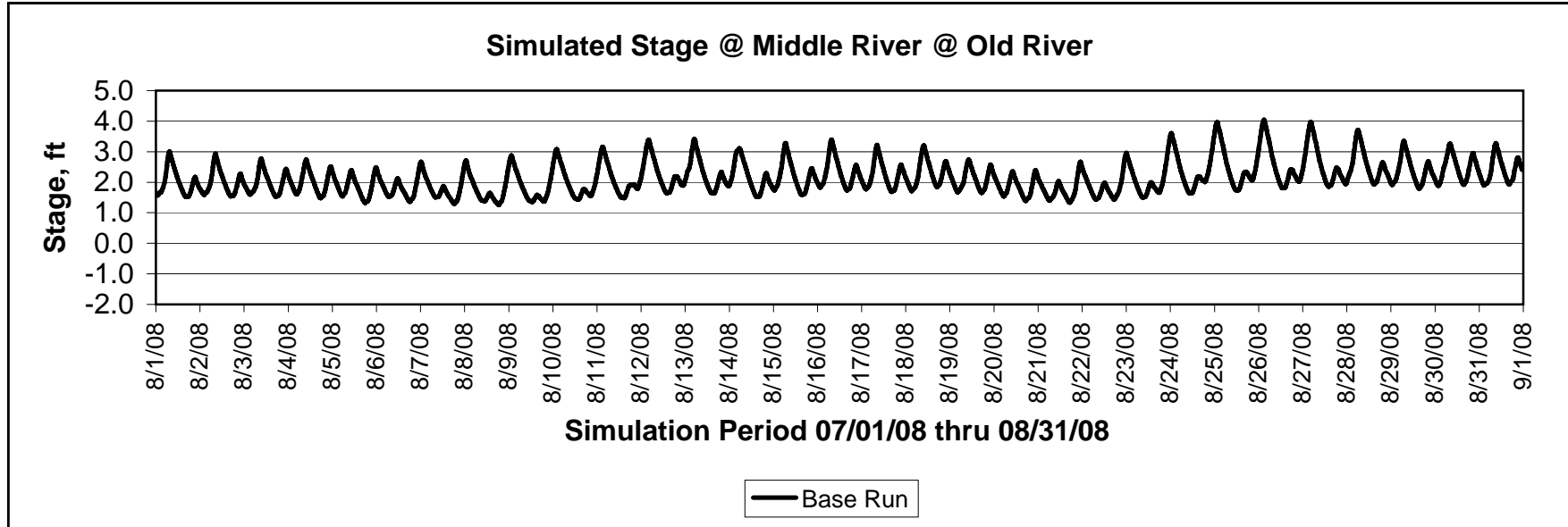
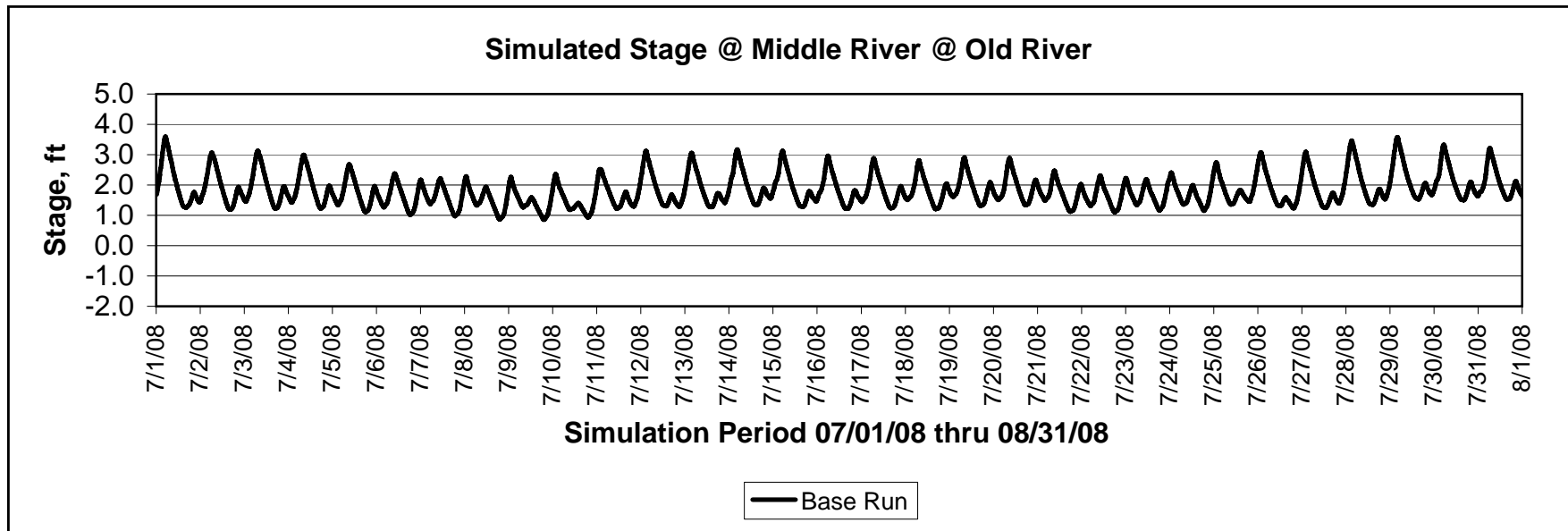




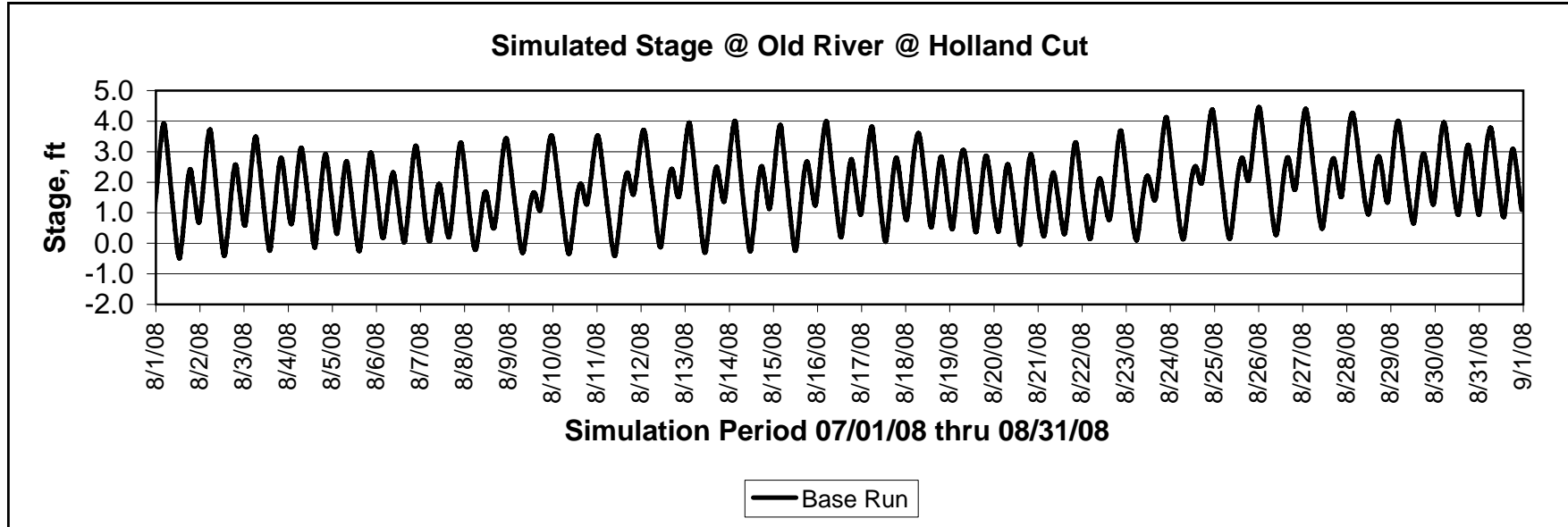
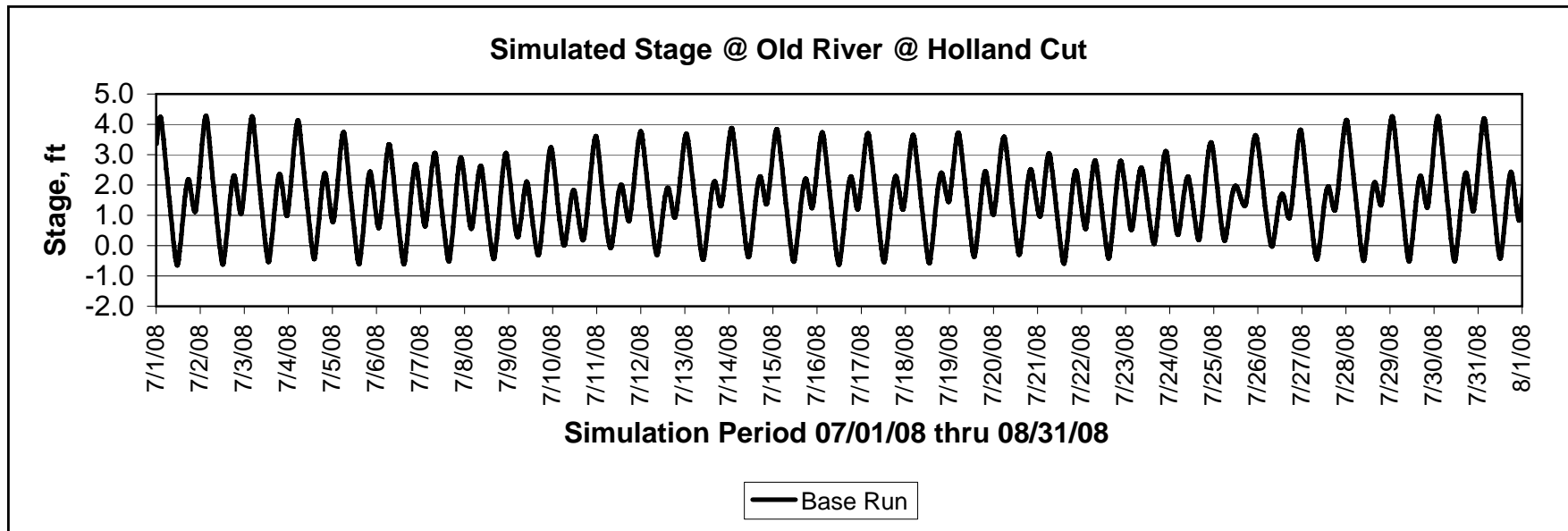


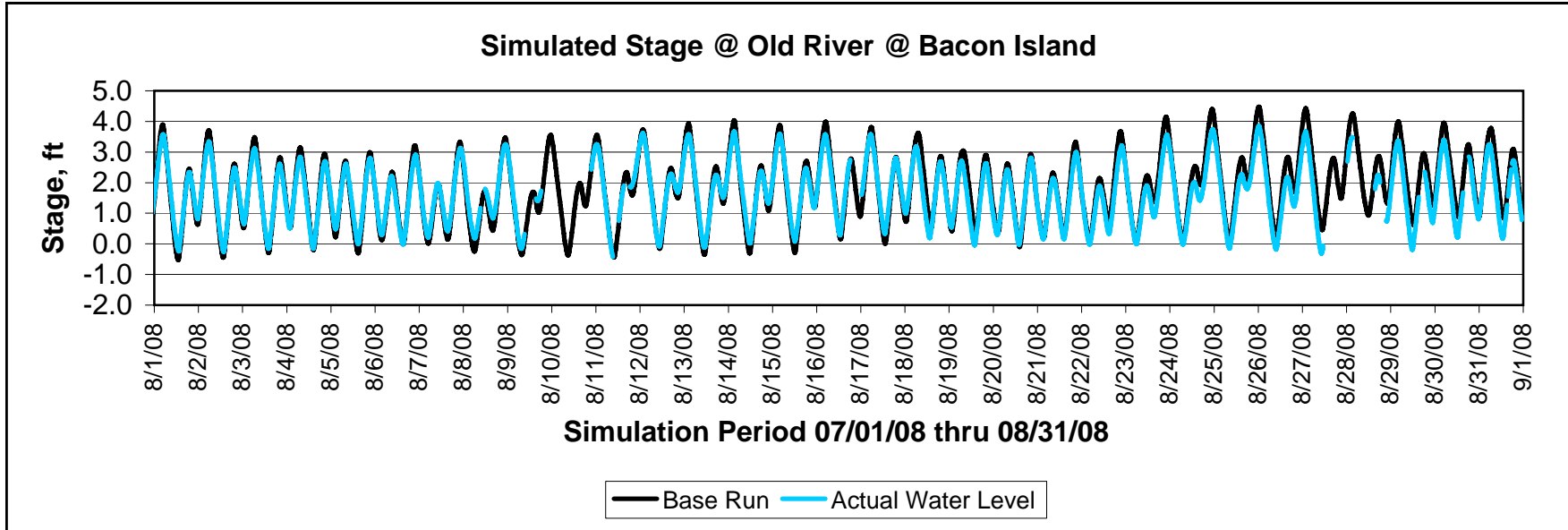
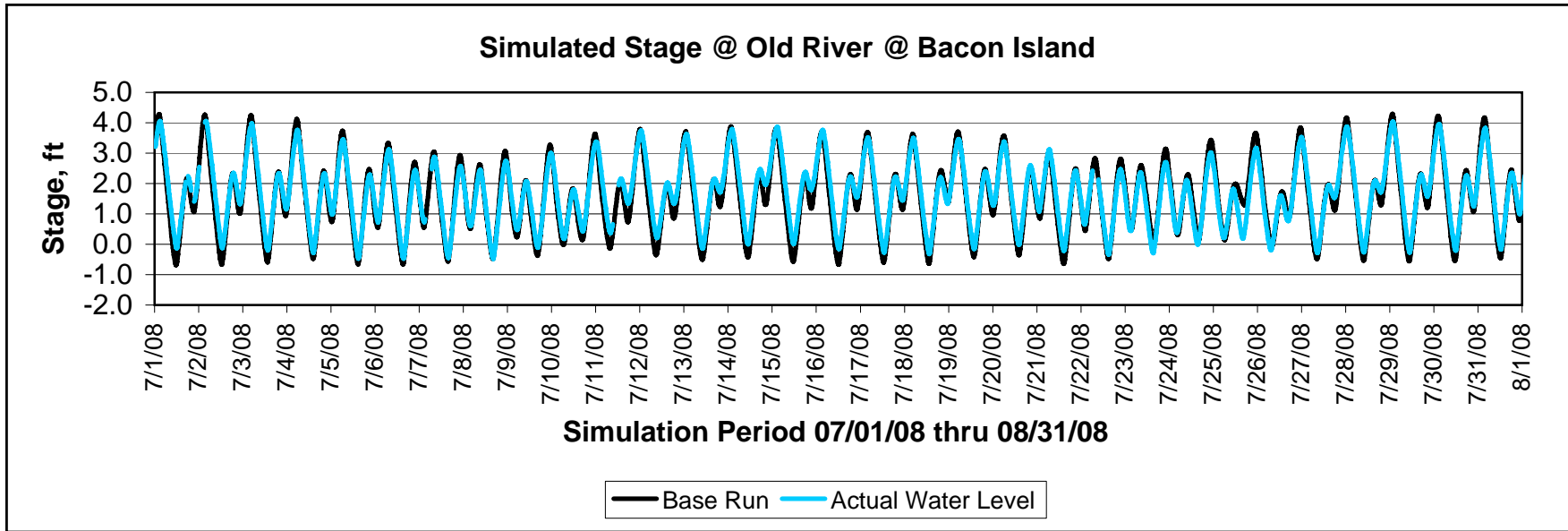


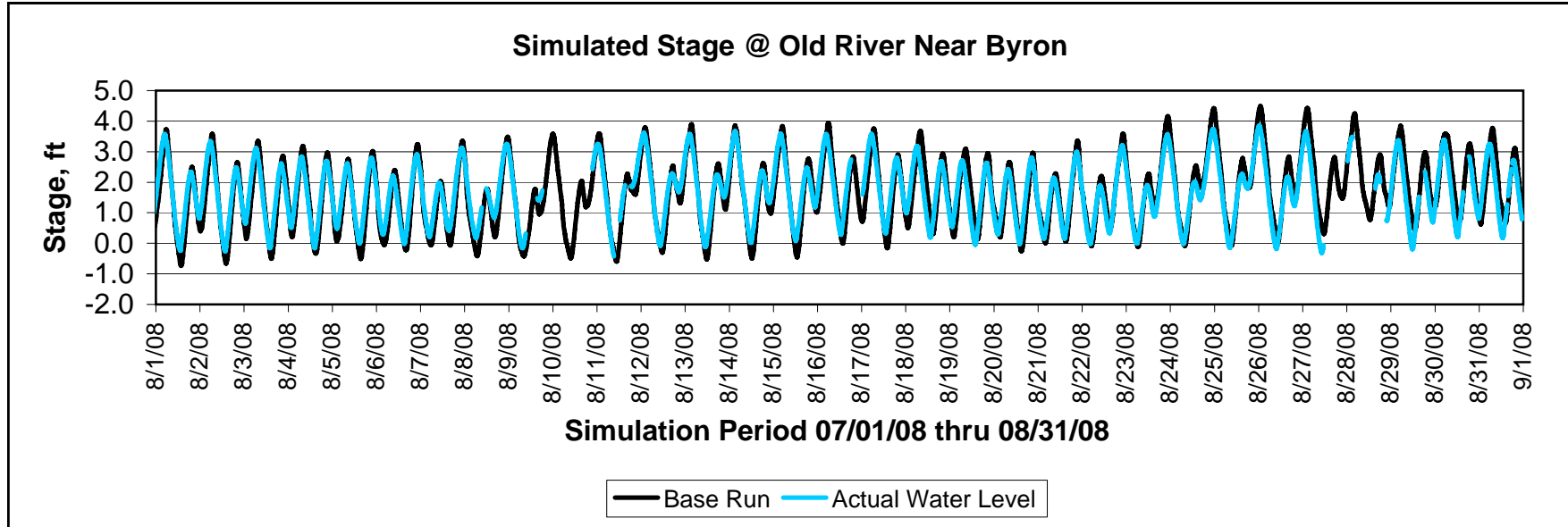
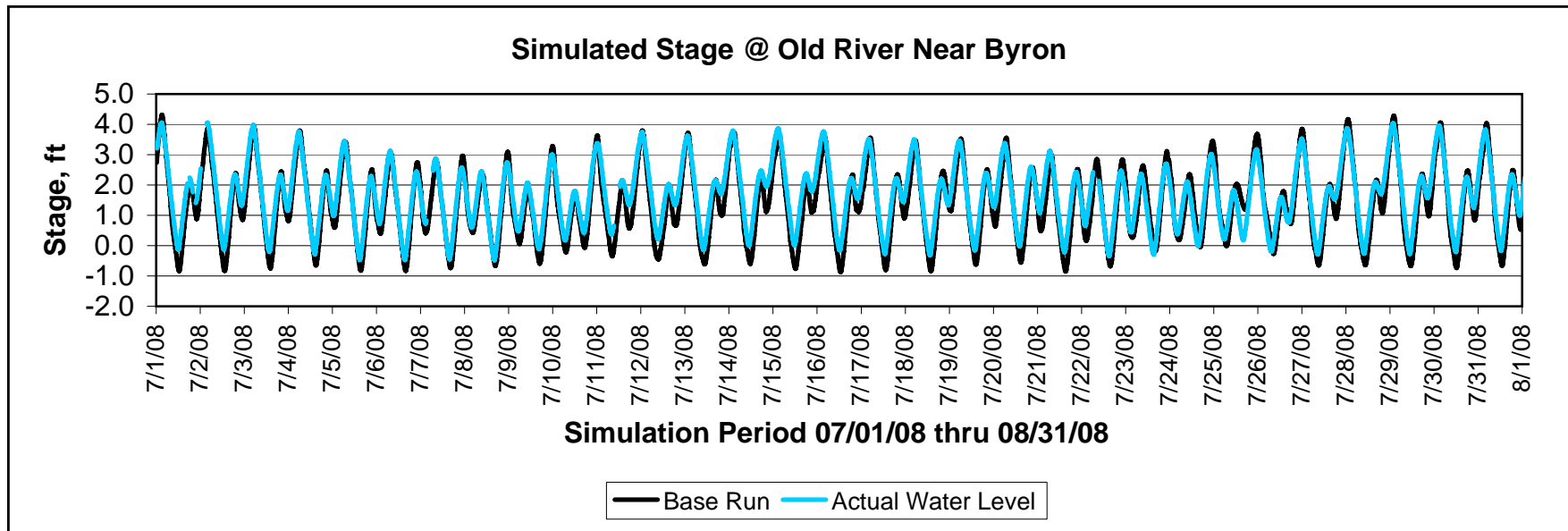


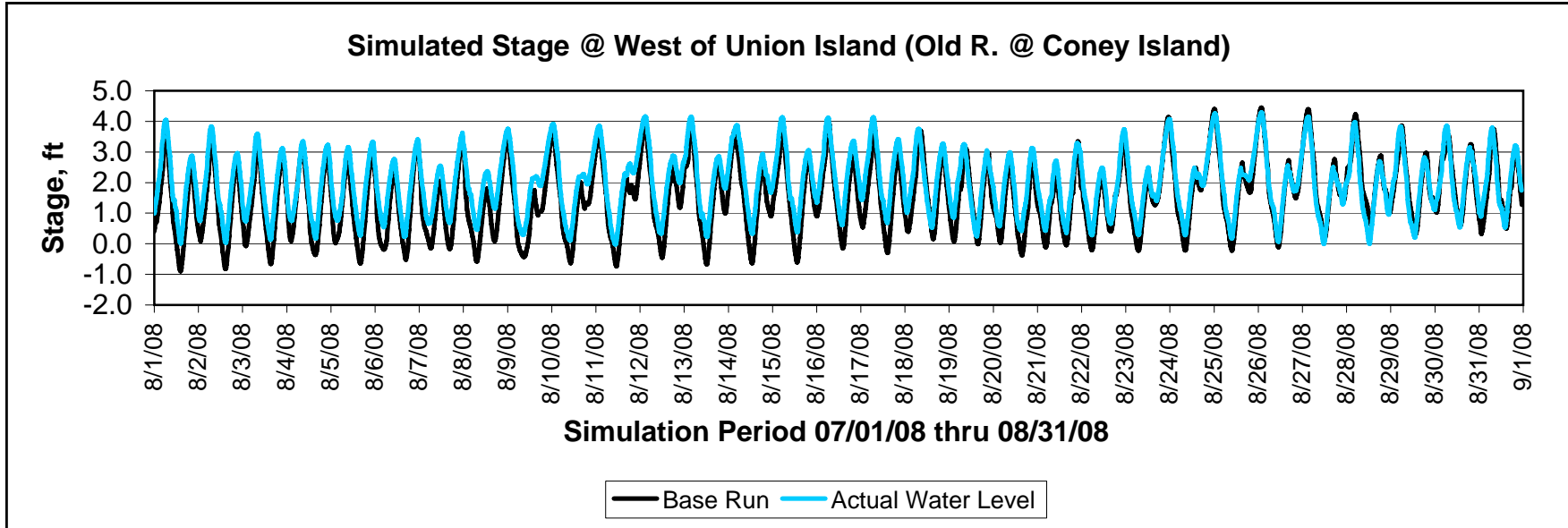
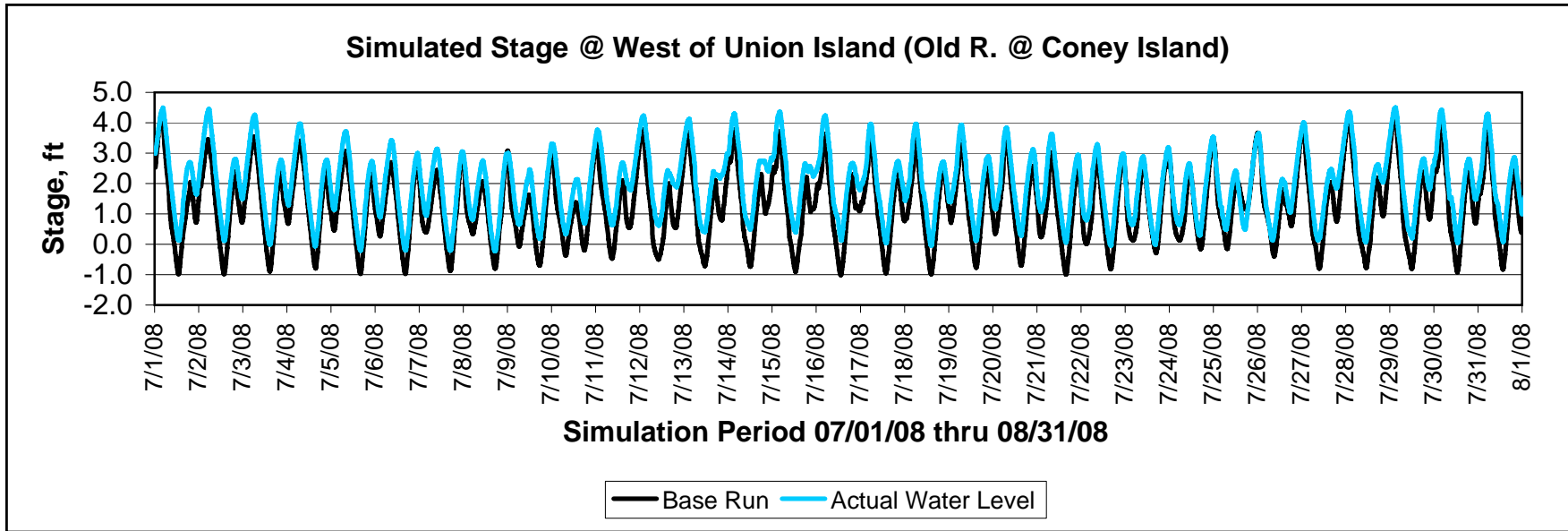


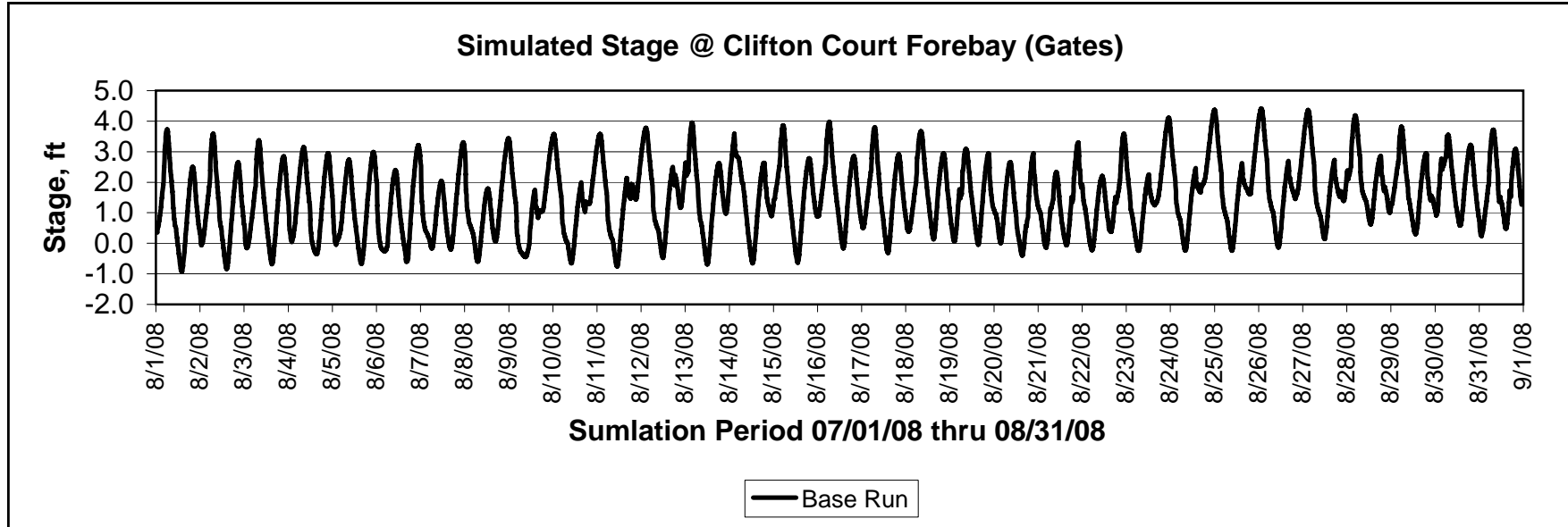
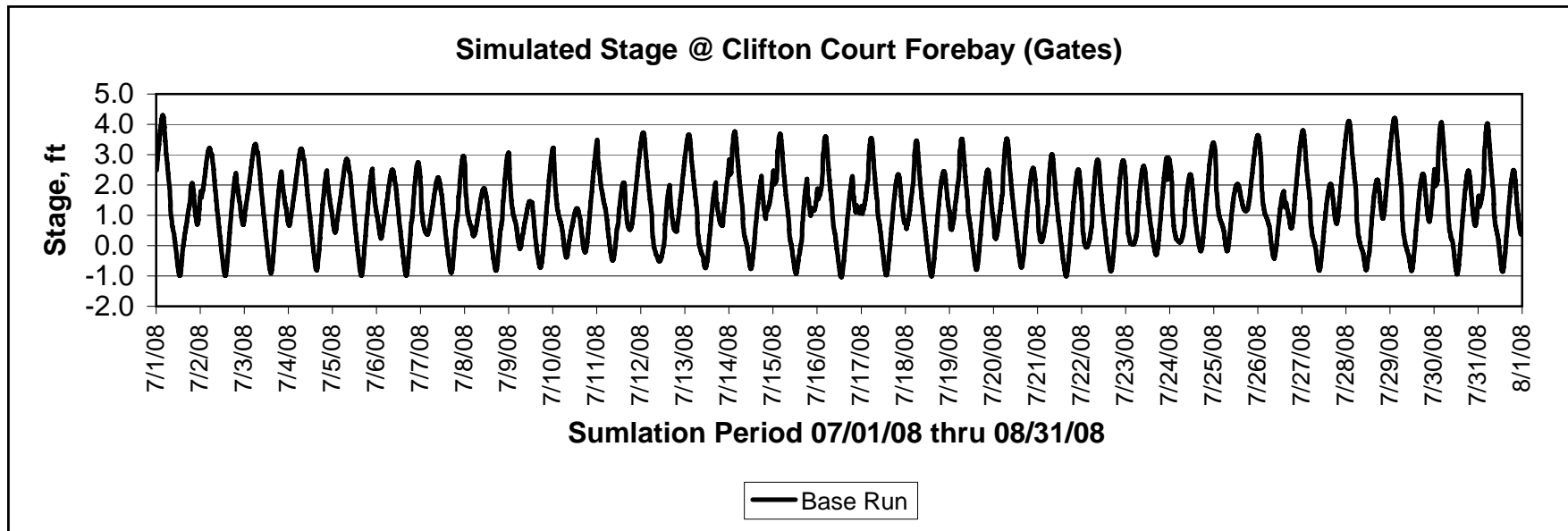
OLD RIVER - STAGE

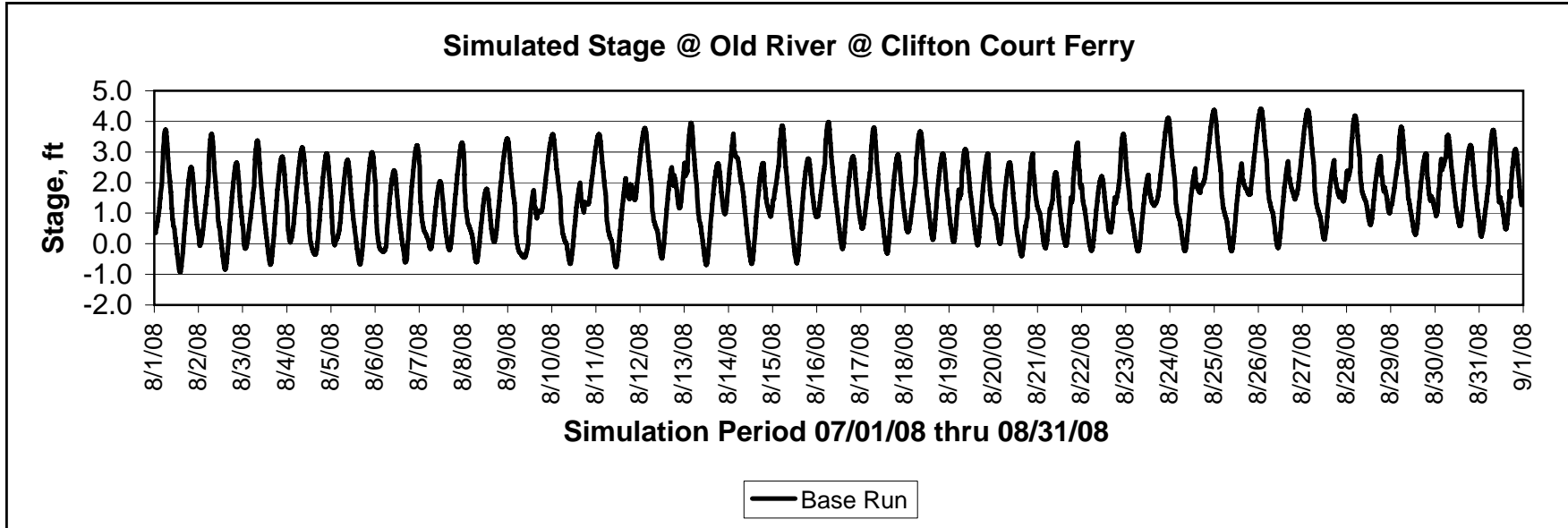
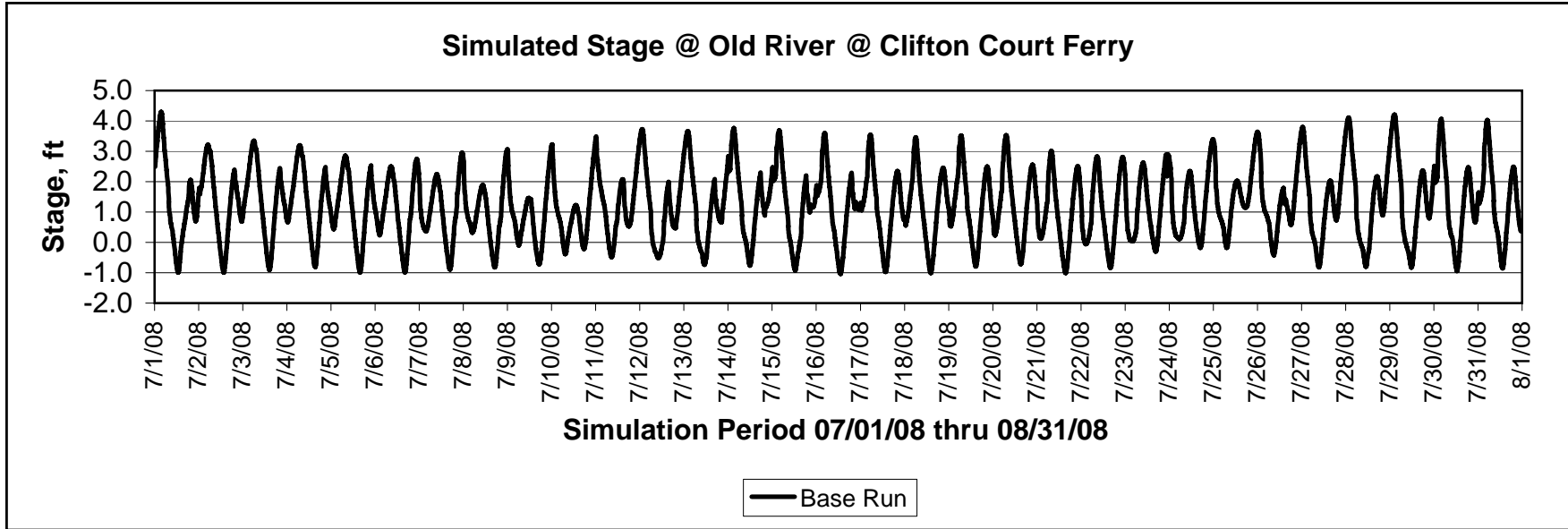


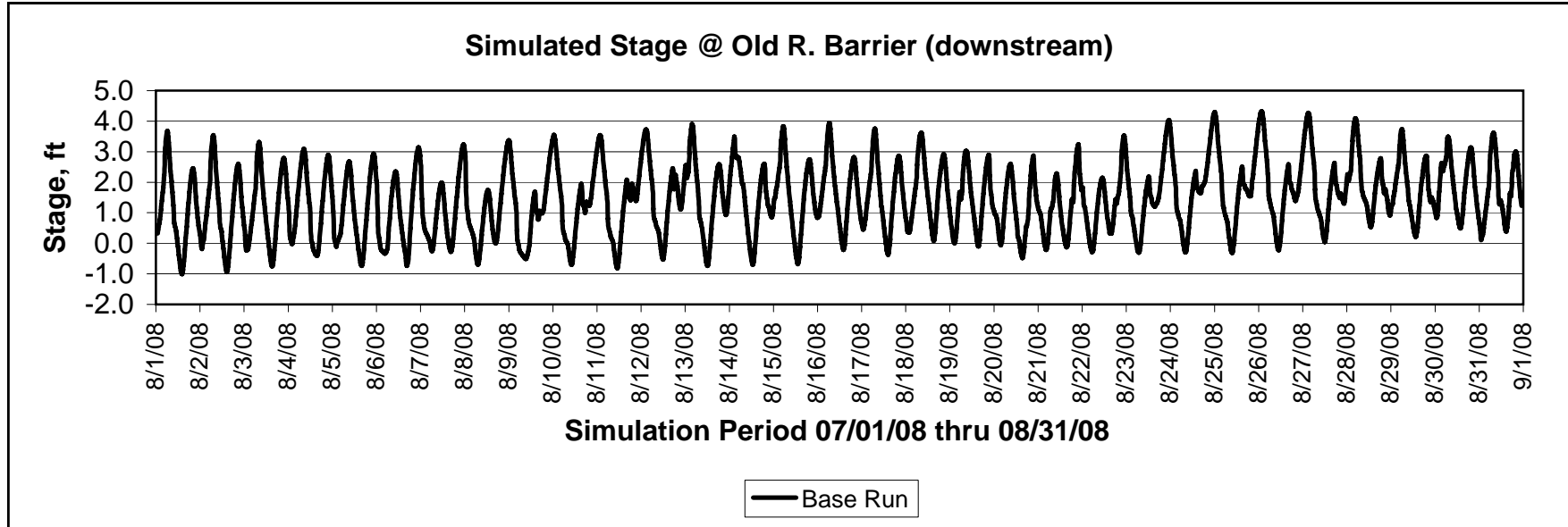
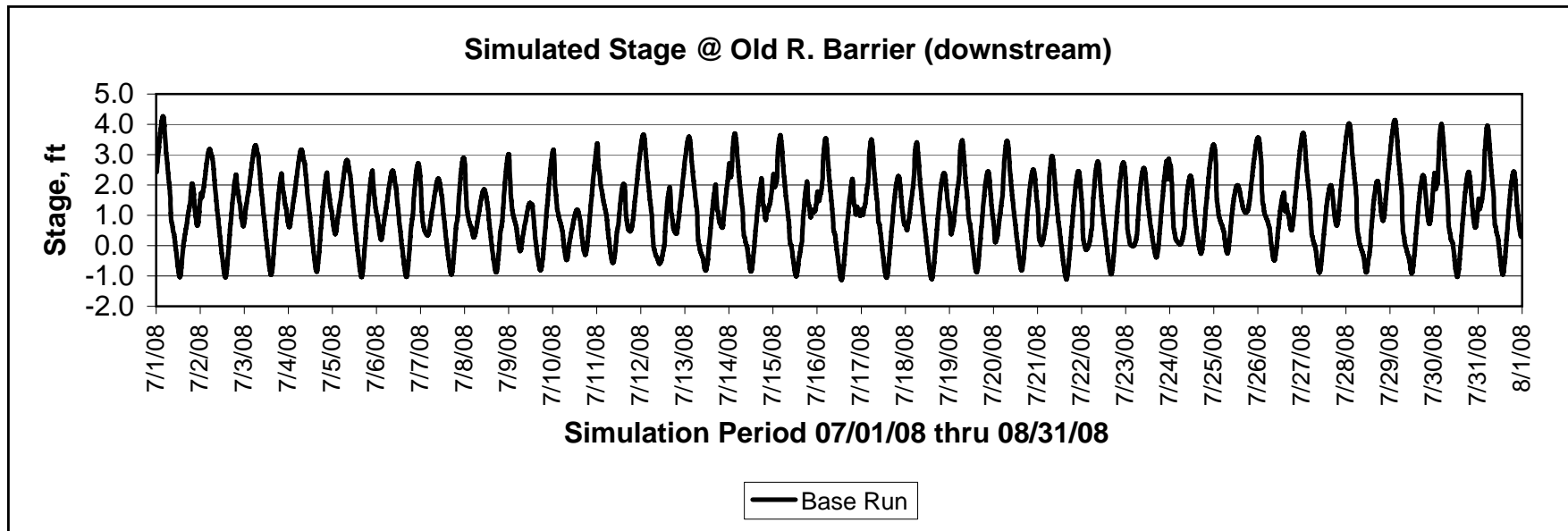


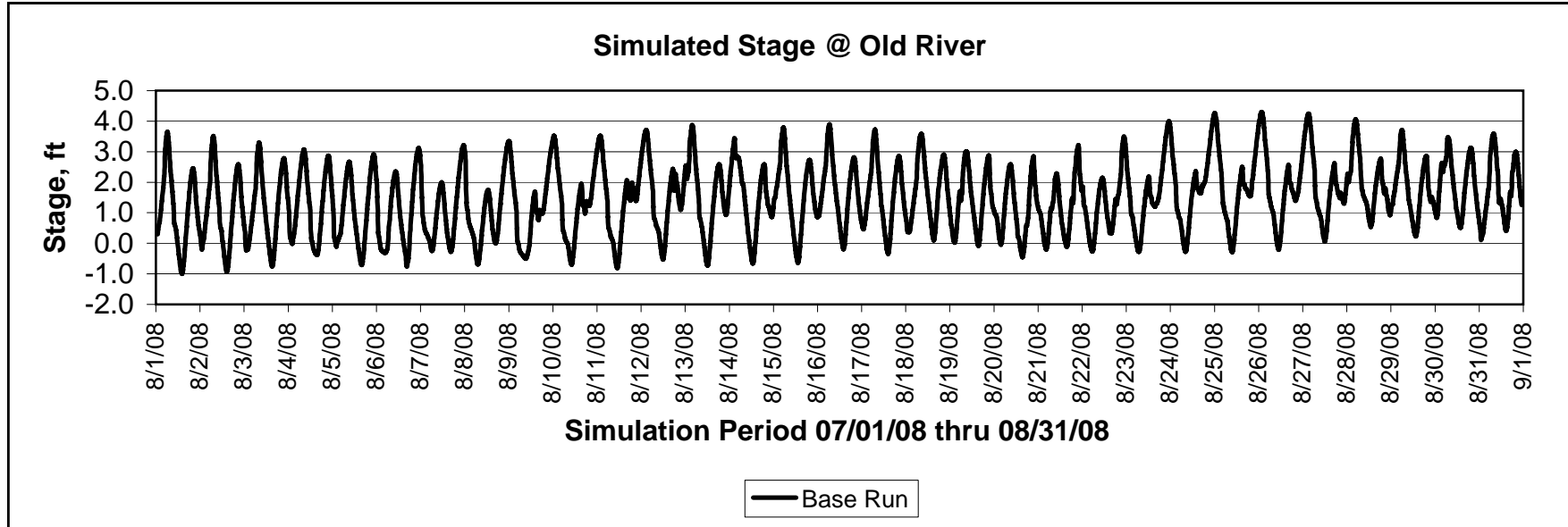
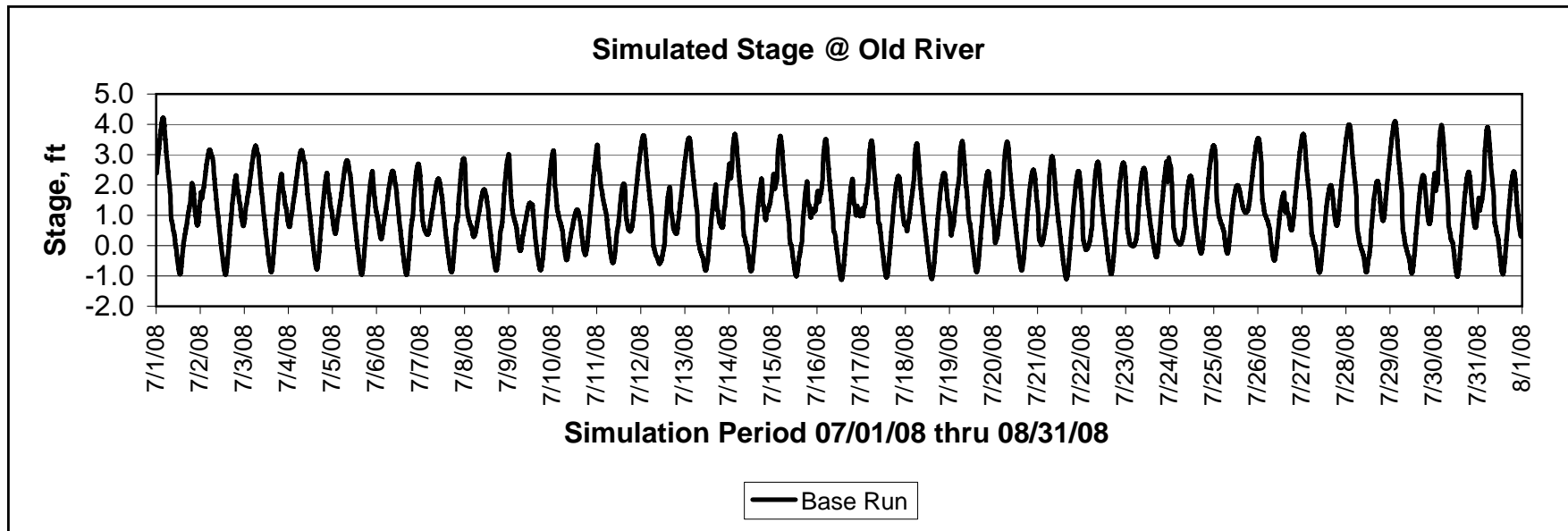


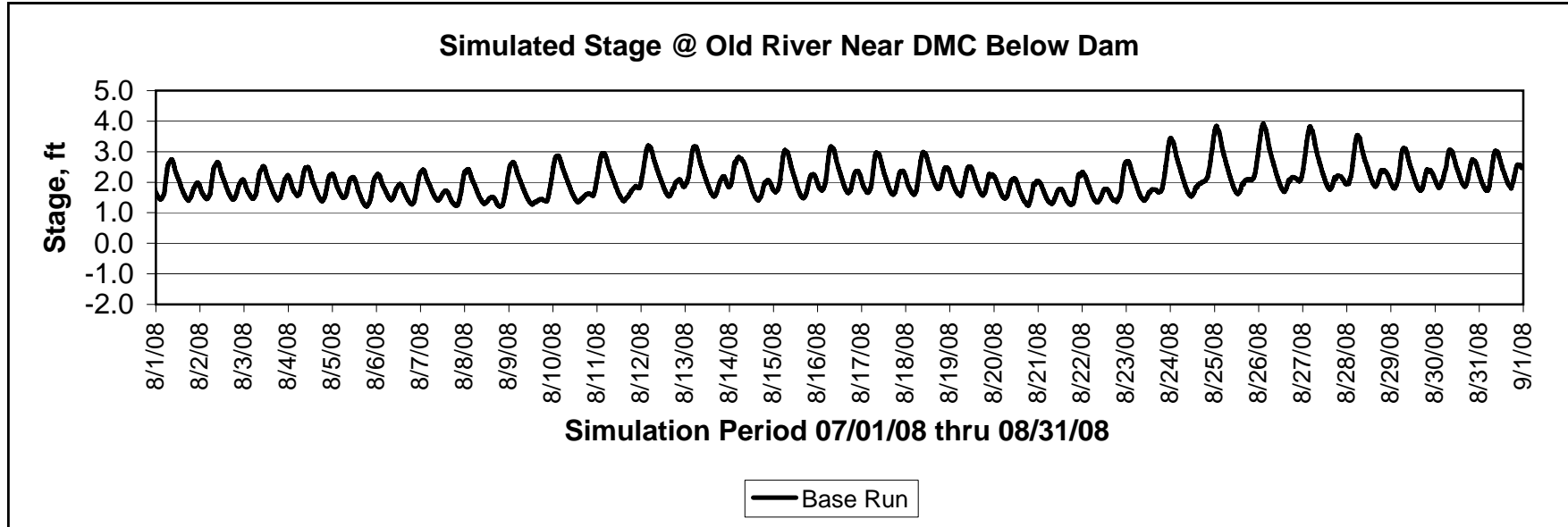
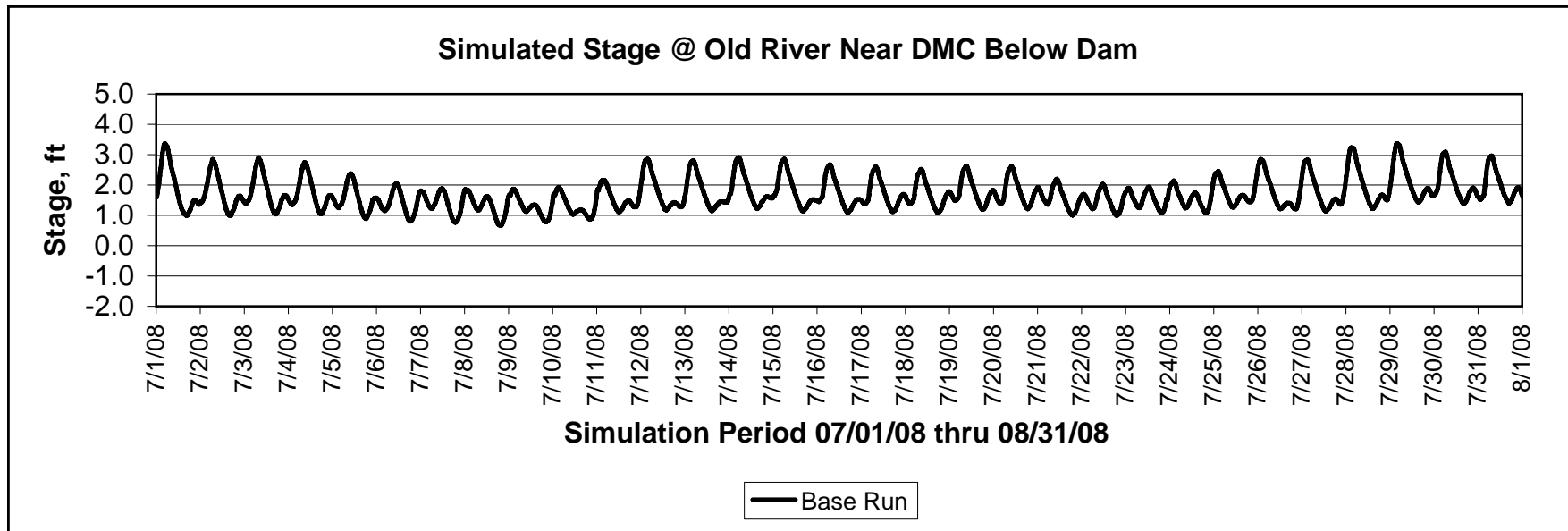


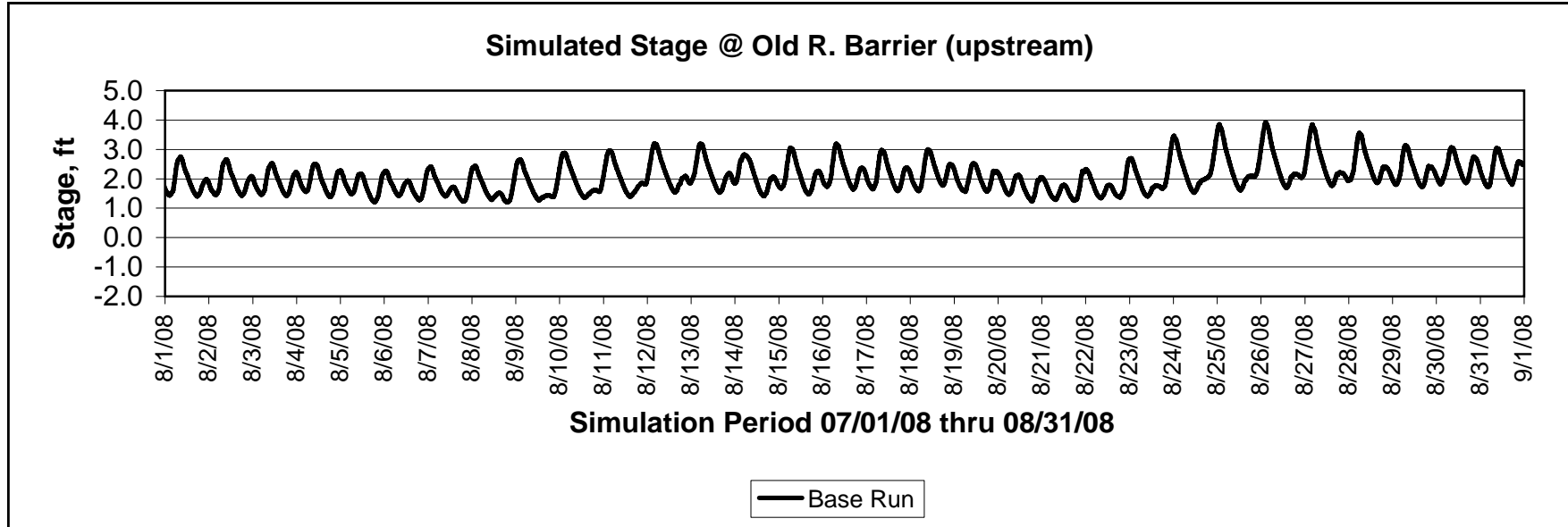
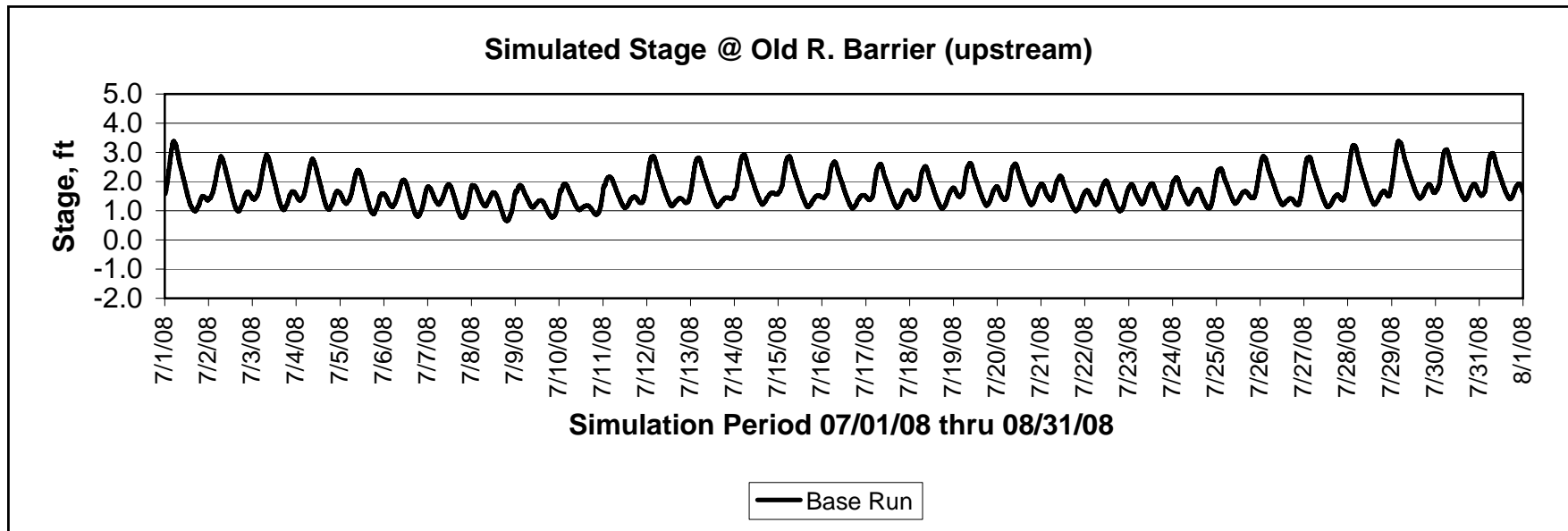


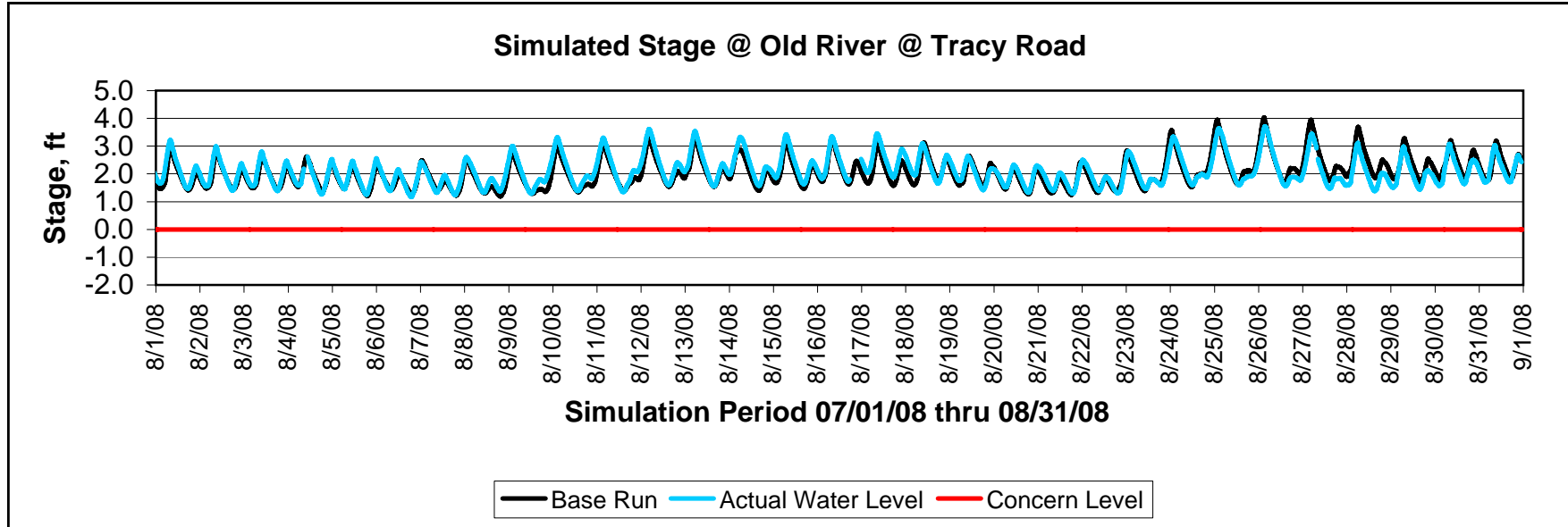
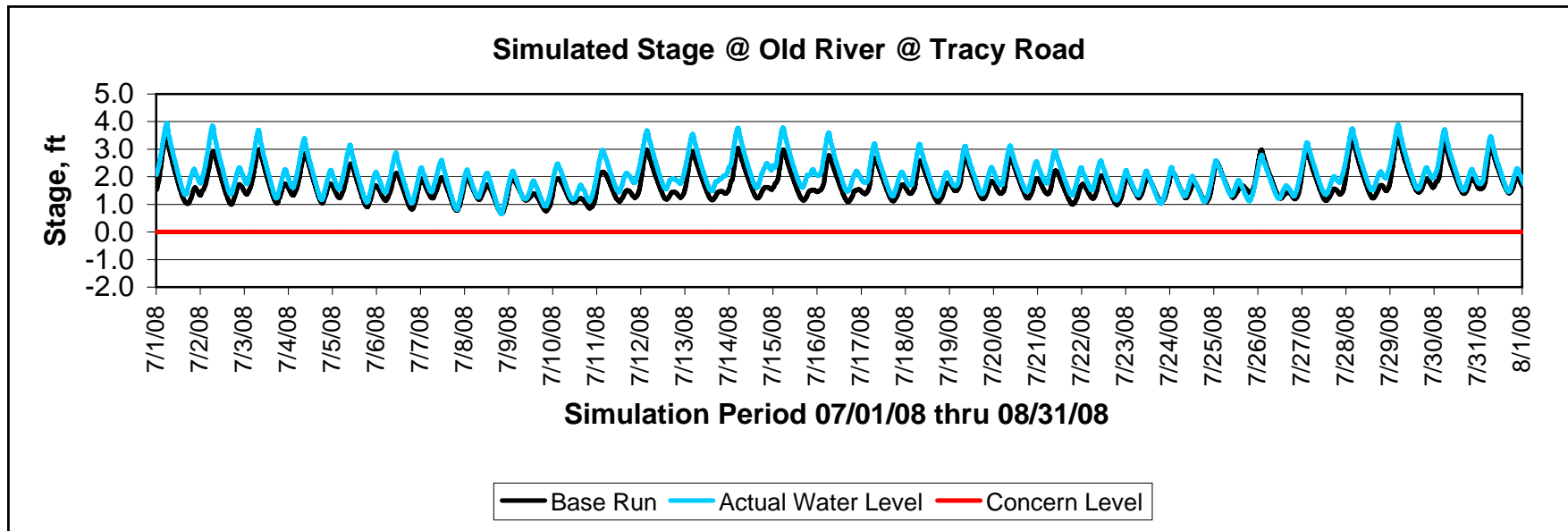


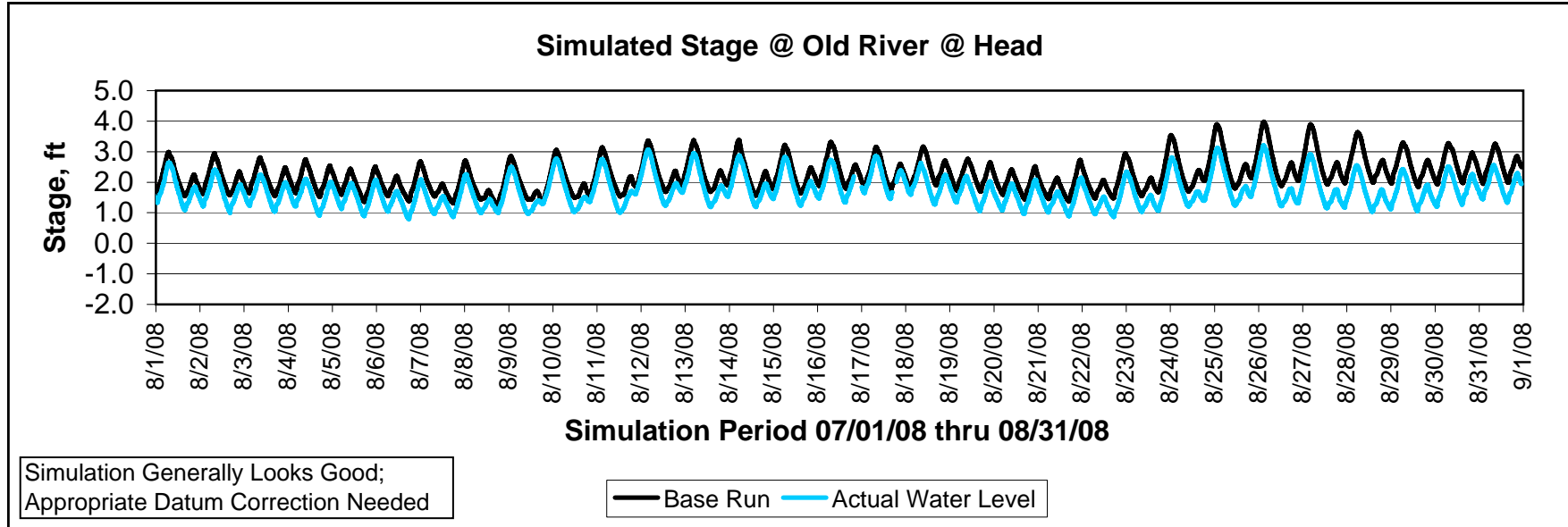
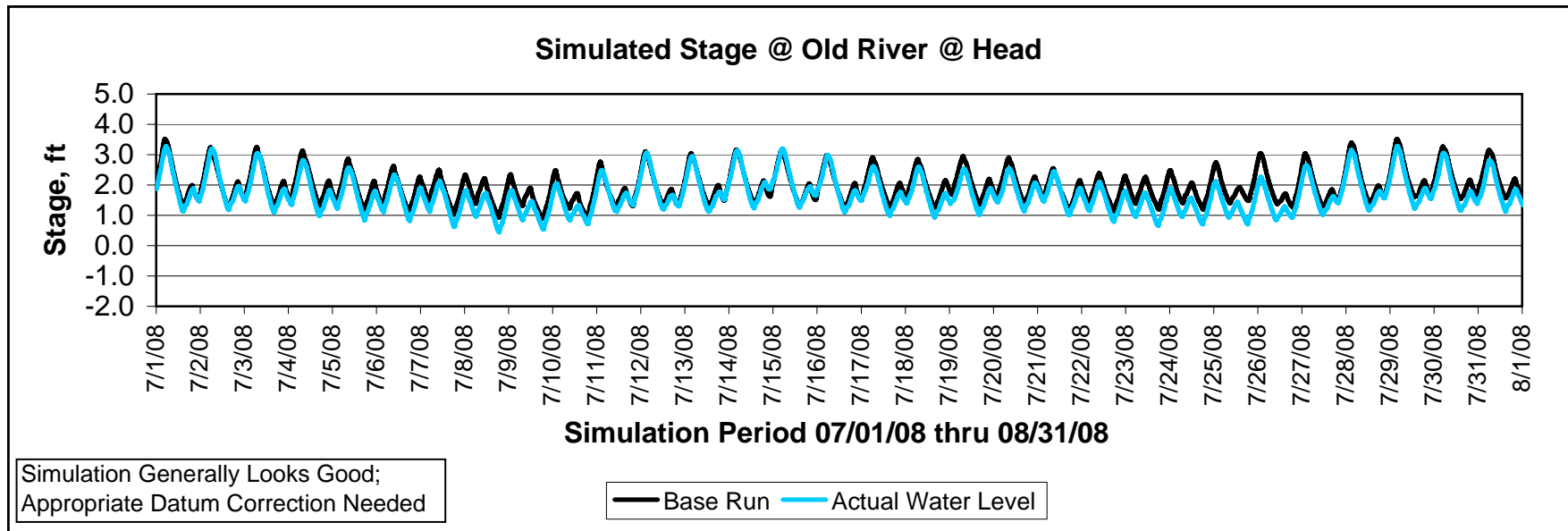


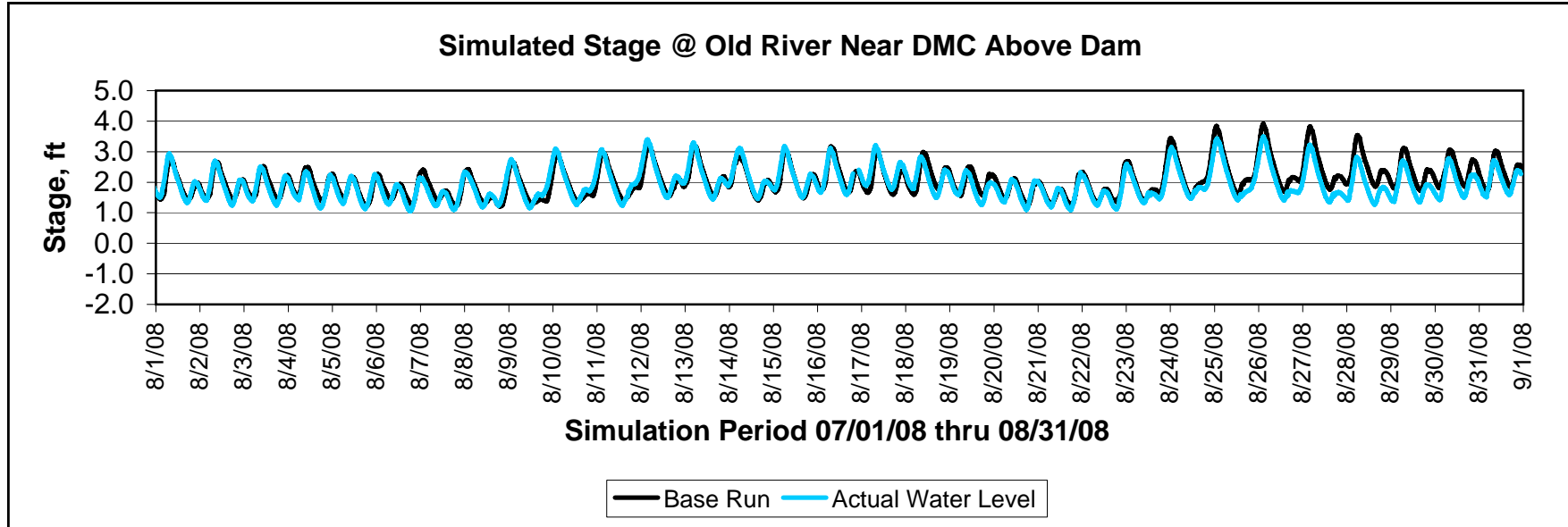
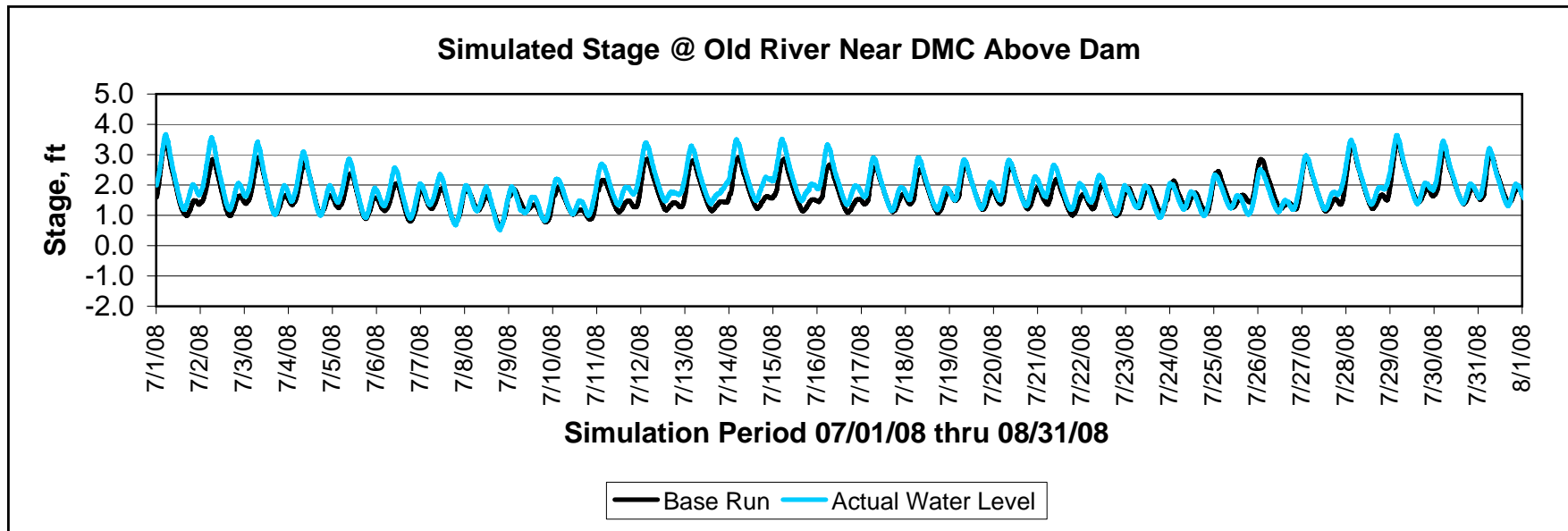


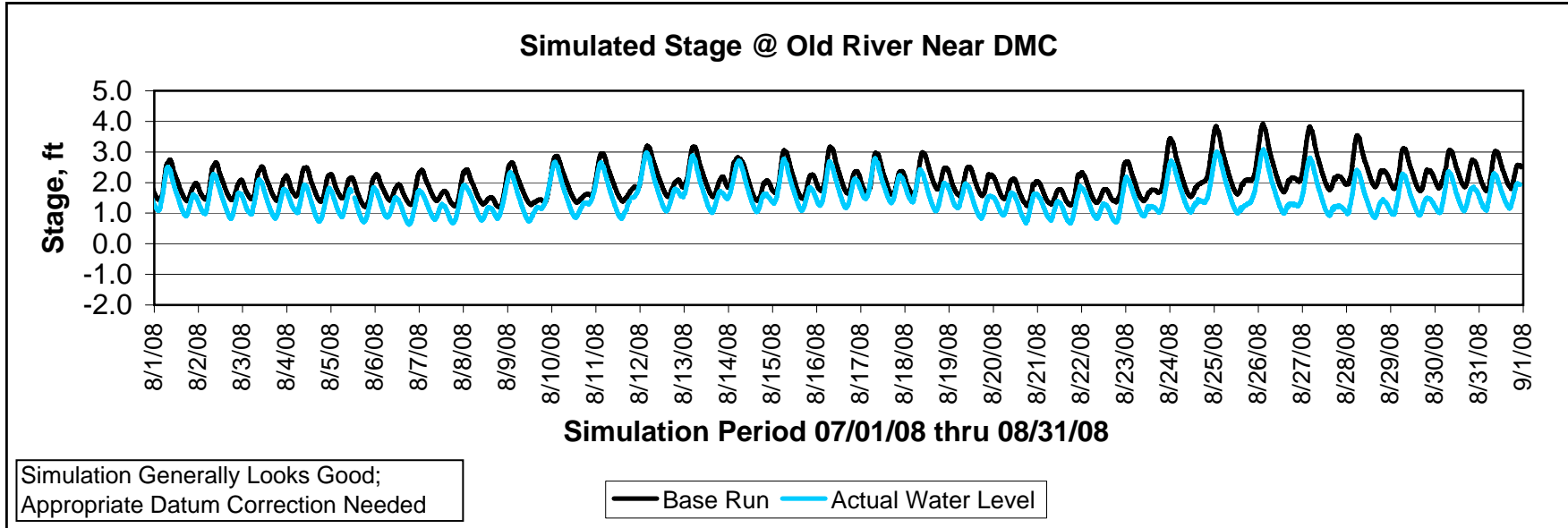
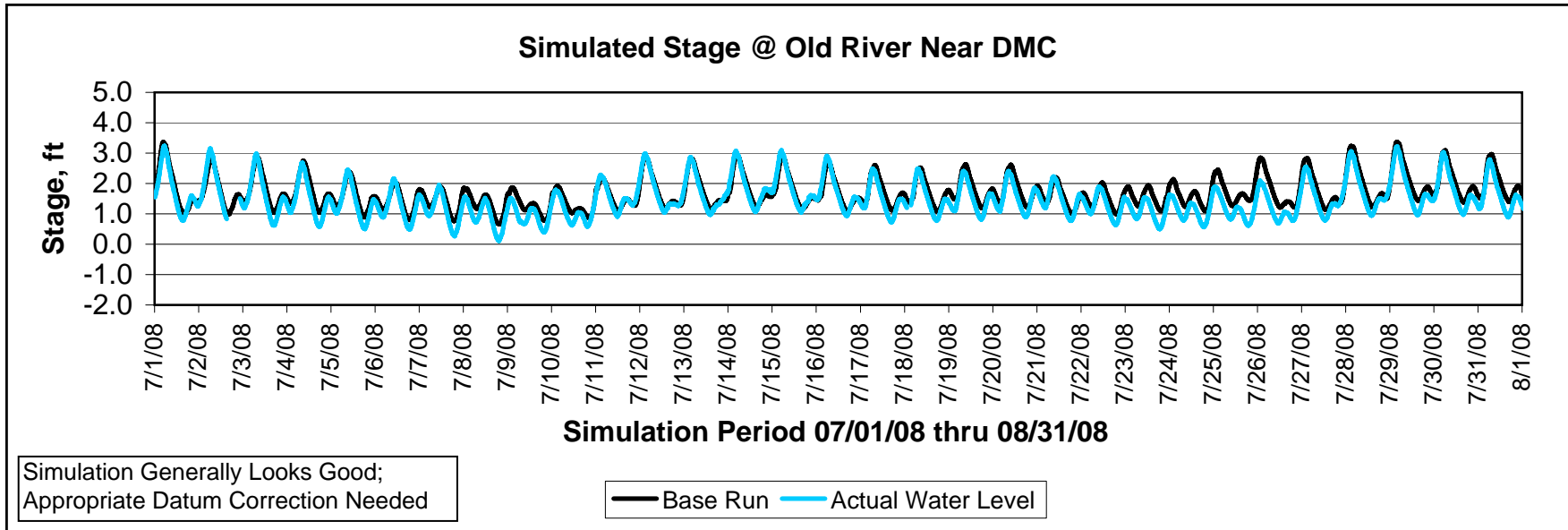




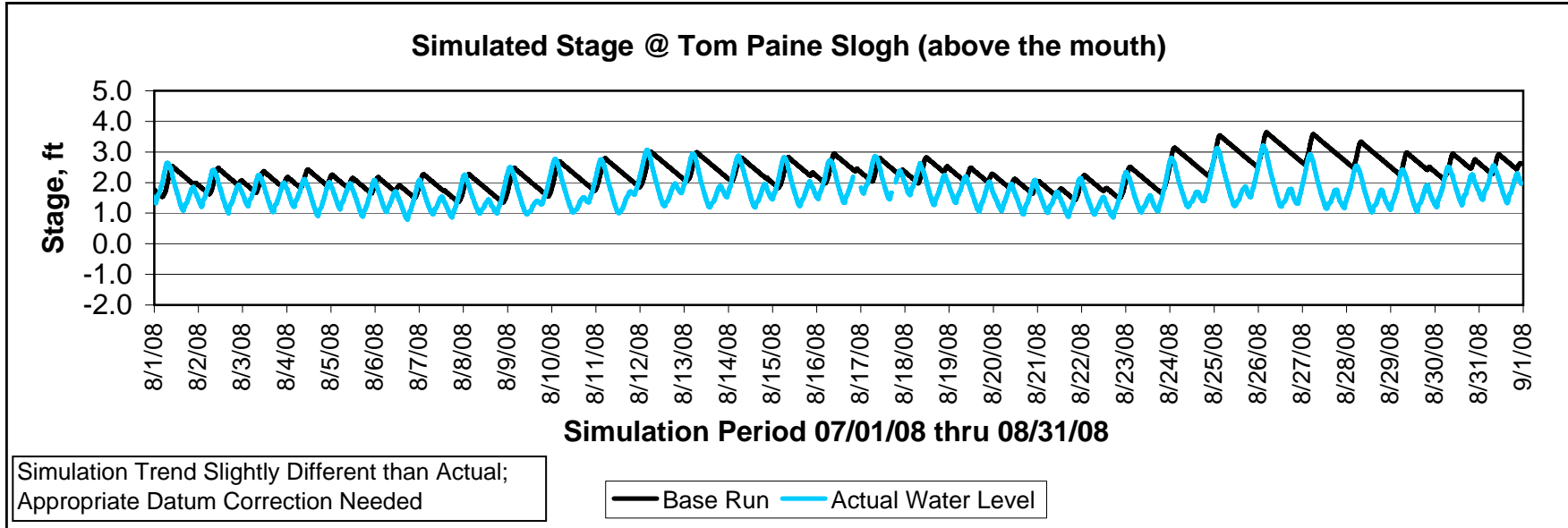
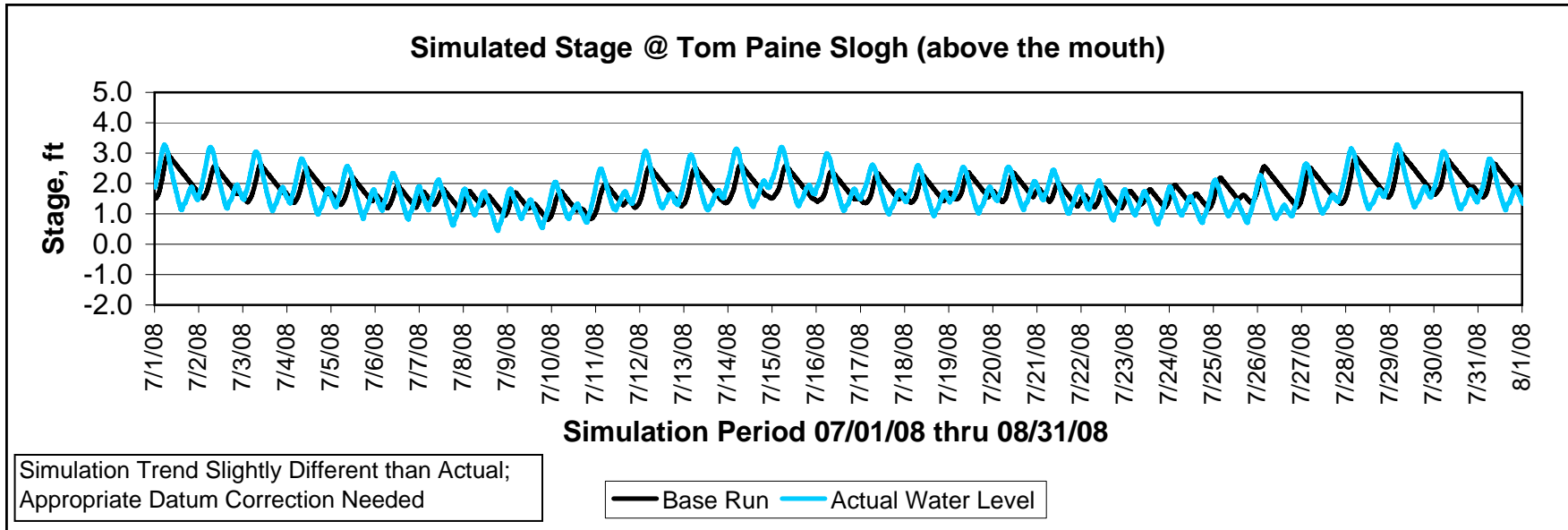


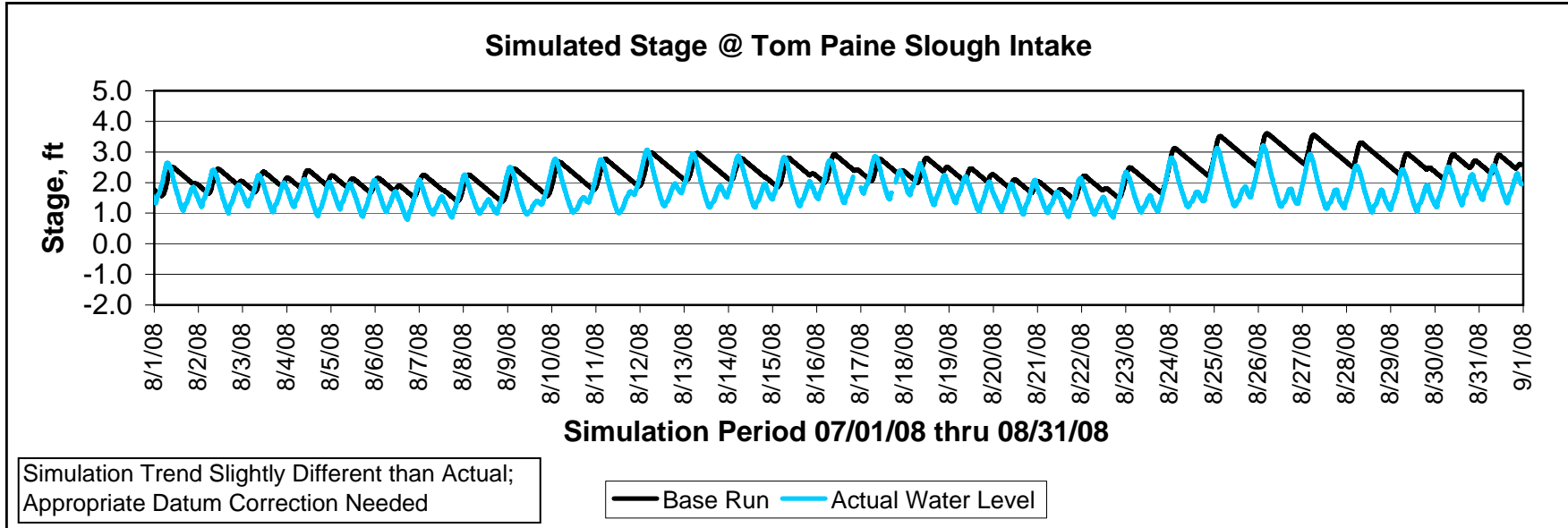
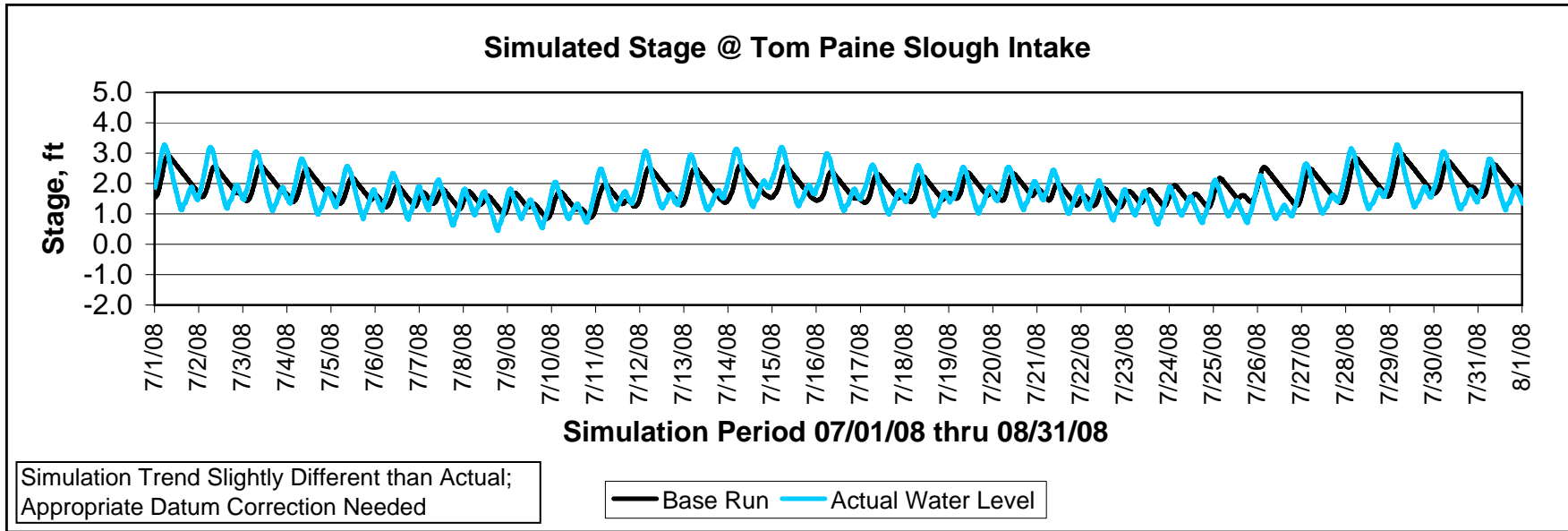




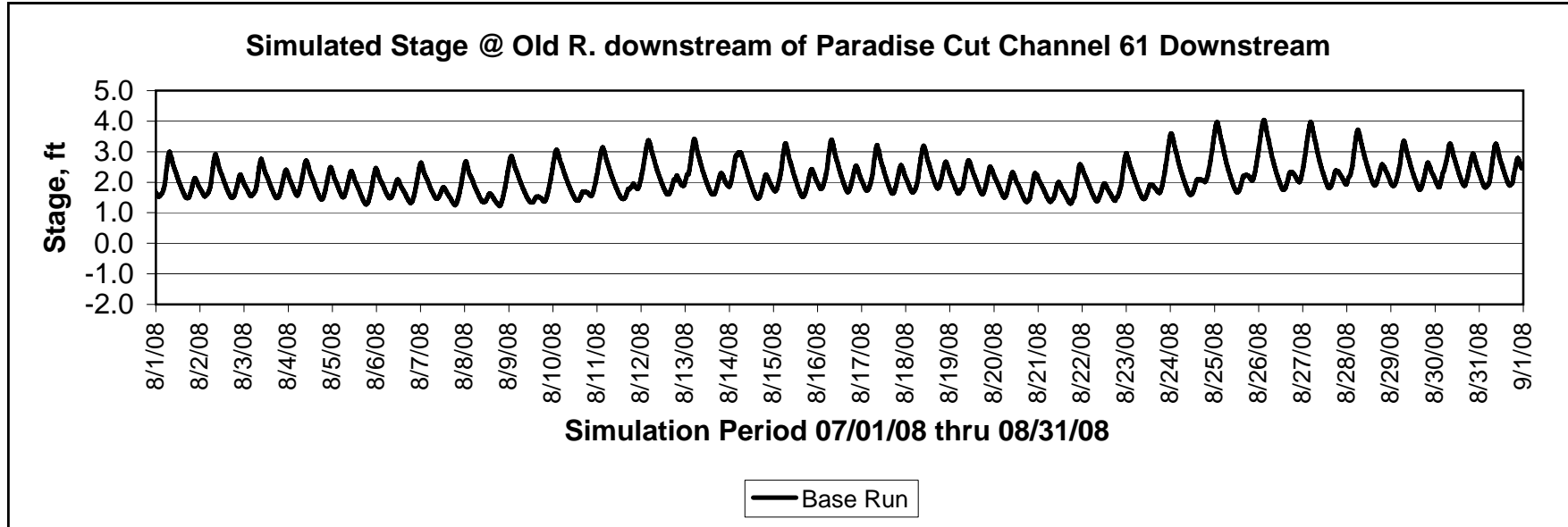
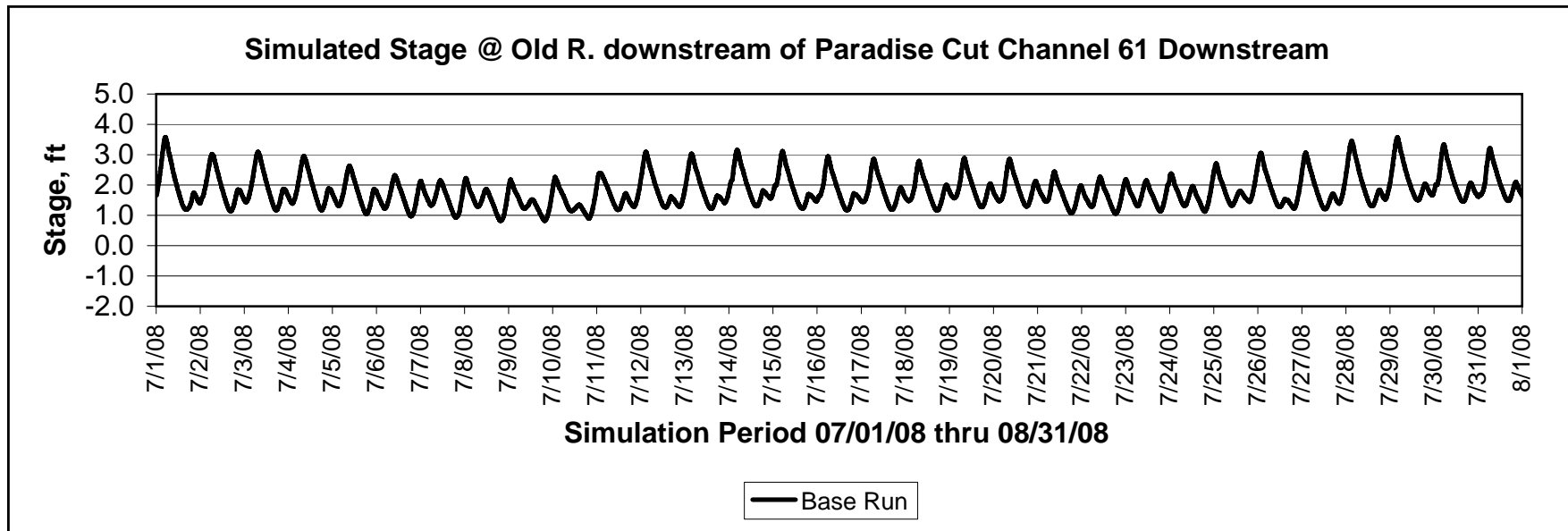


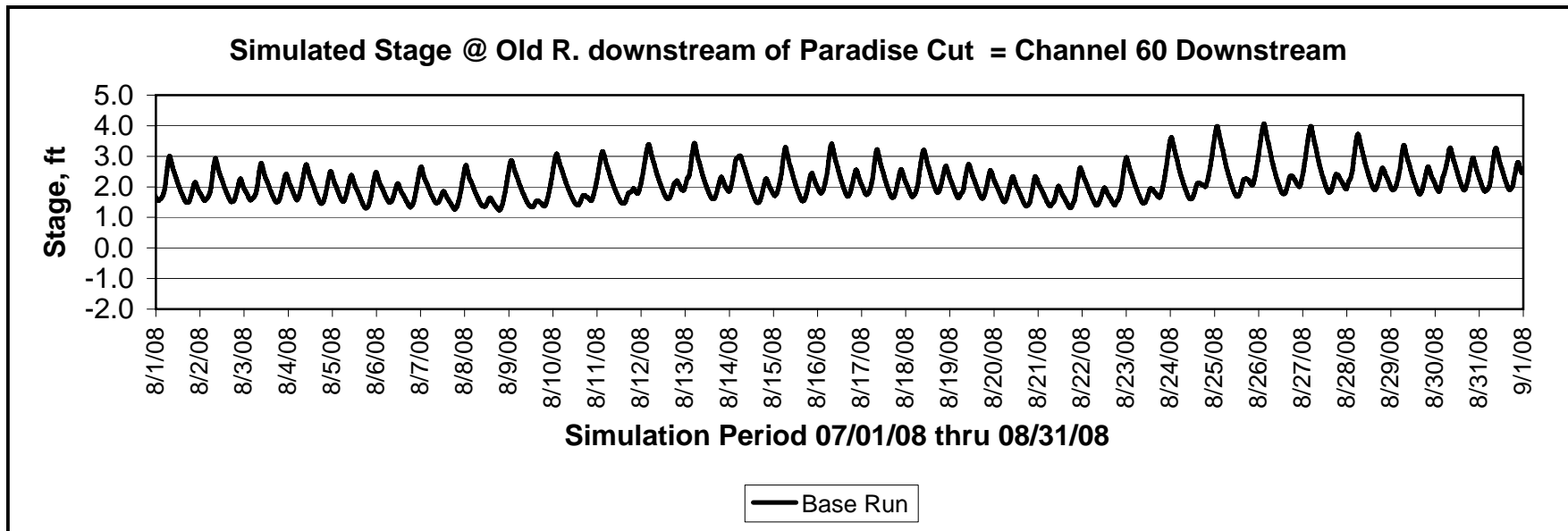
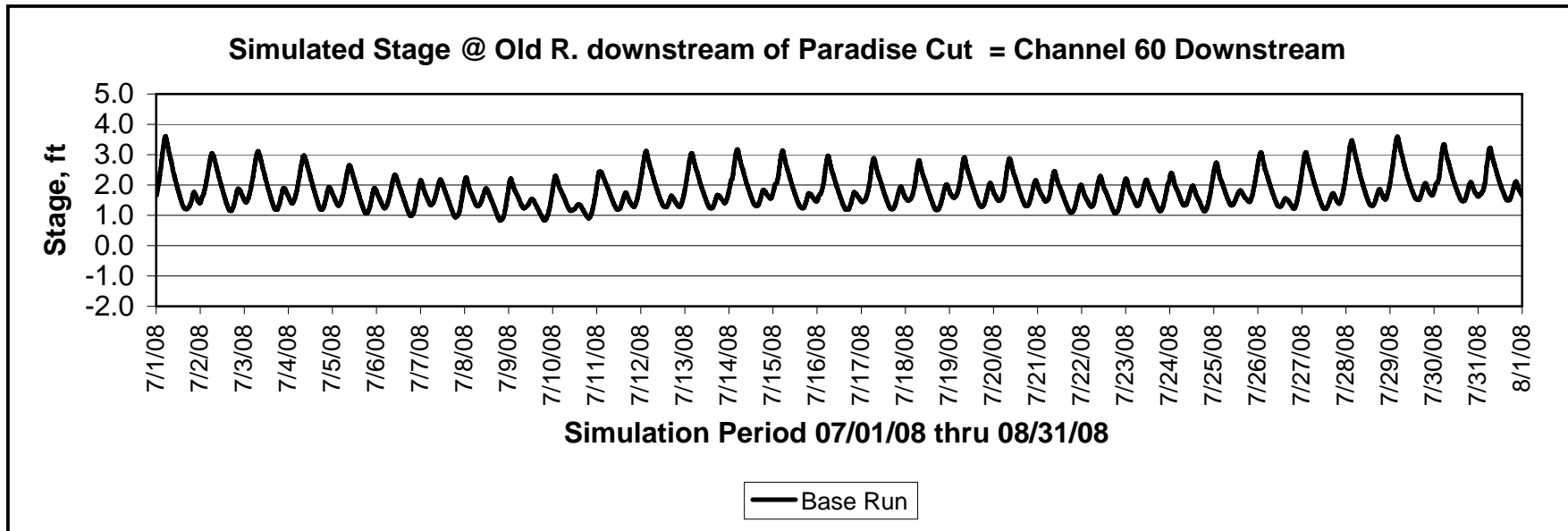
TOM PAINE SLOUGH - STAGE

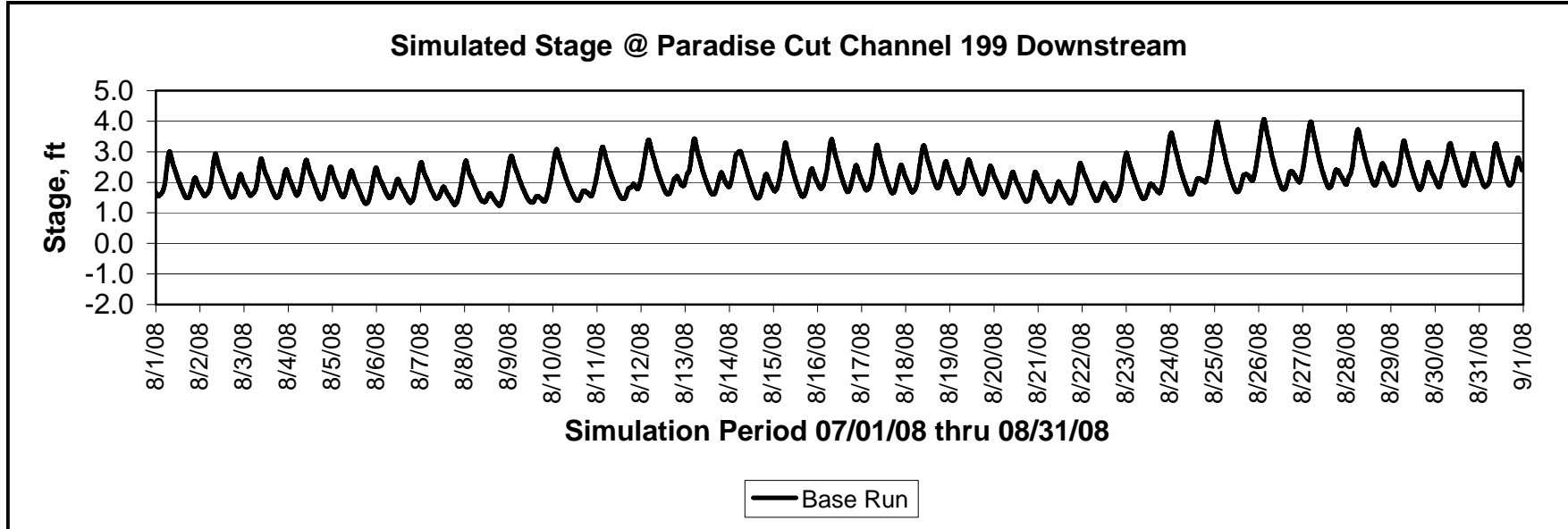
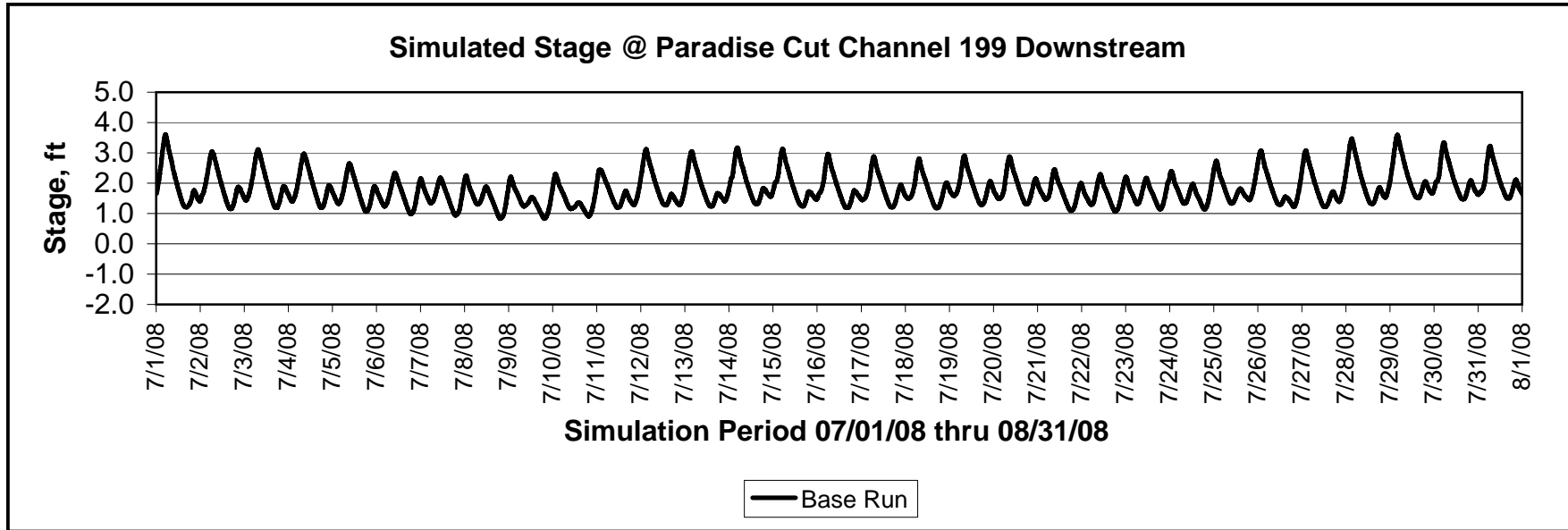


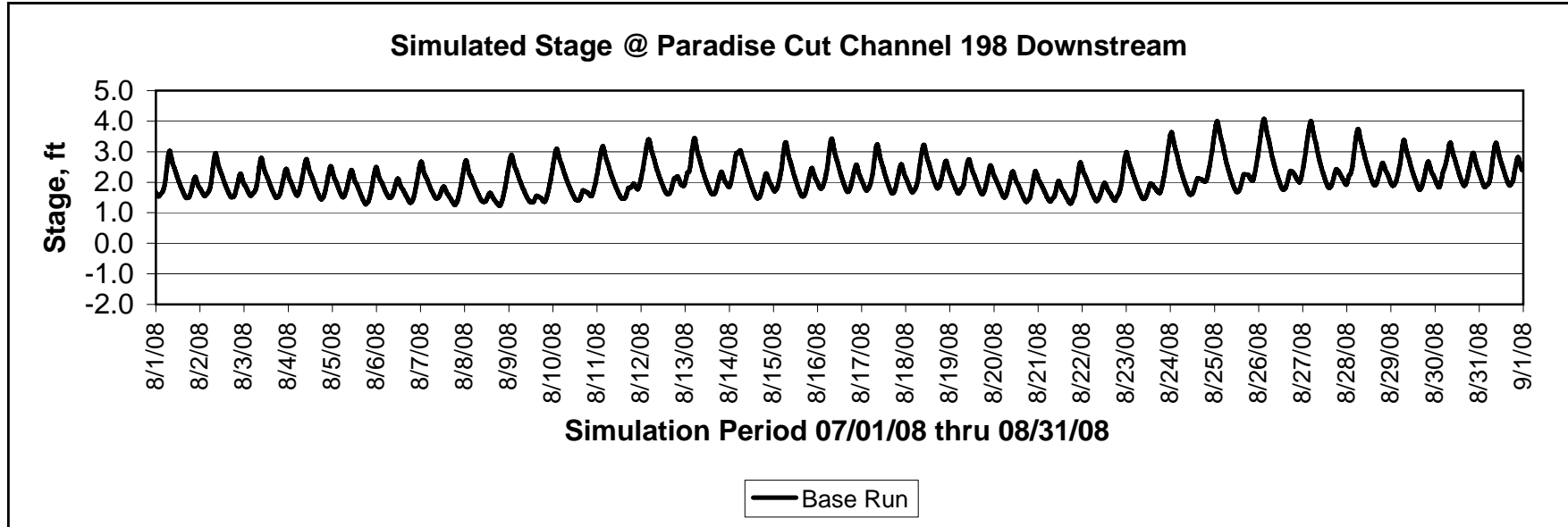
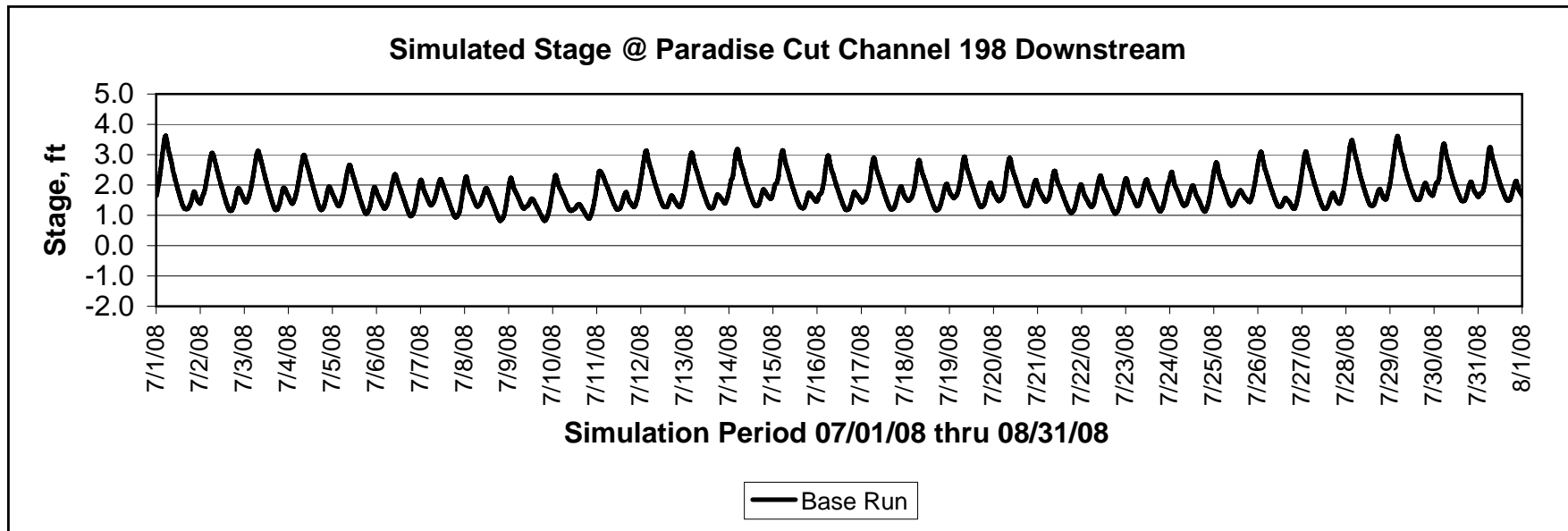


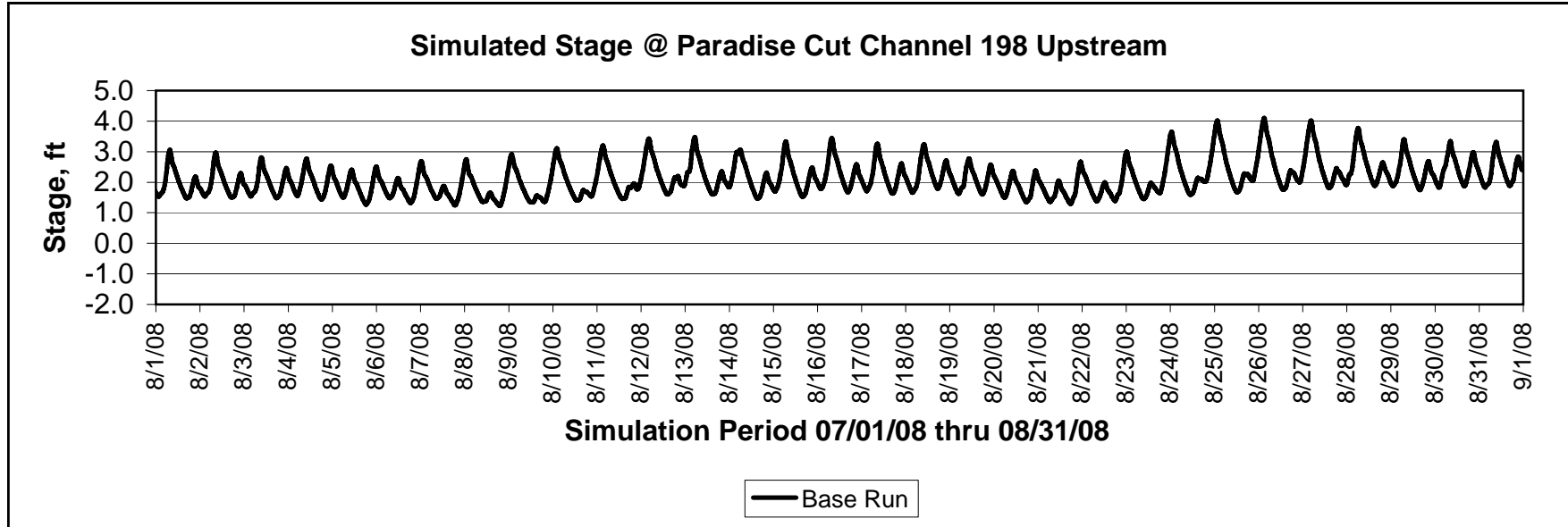
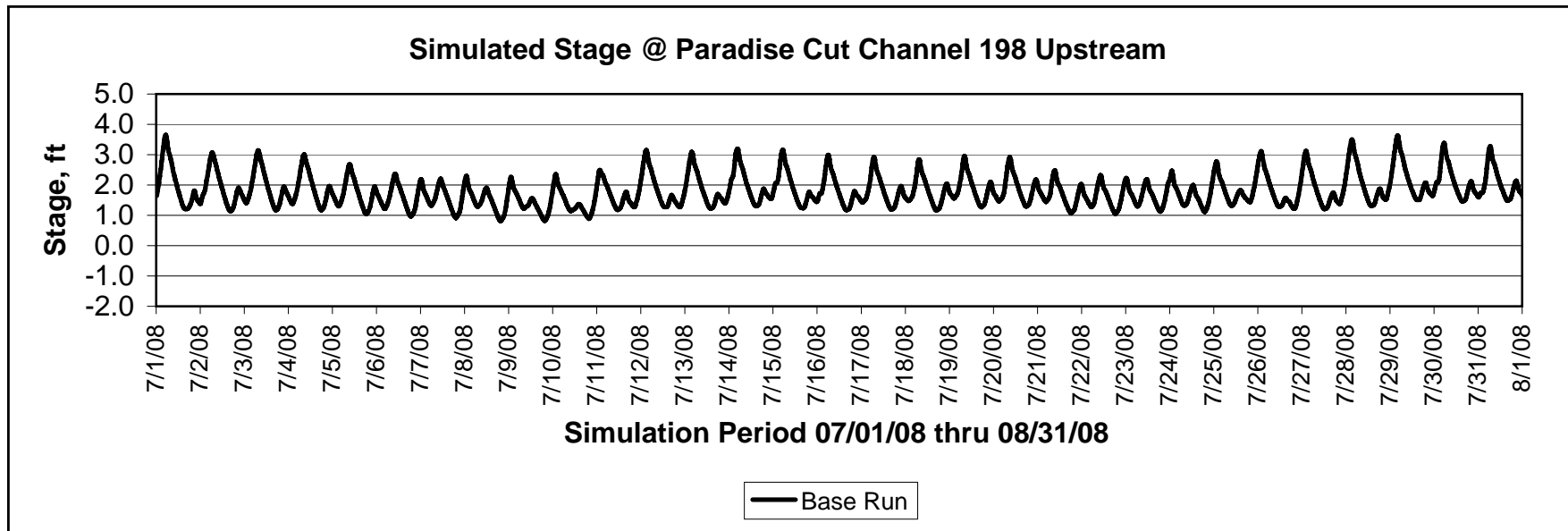
PARADISE CUT- STAGE

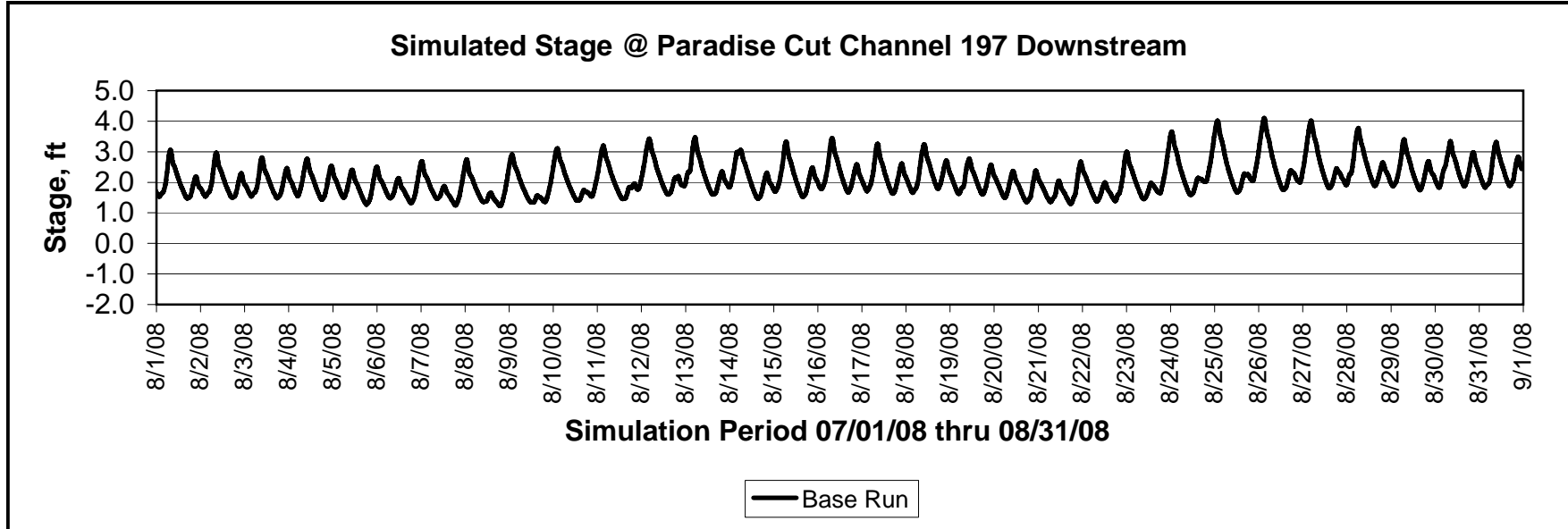
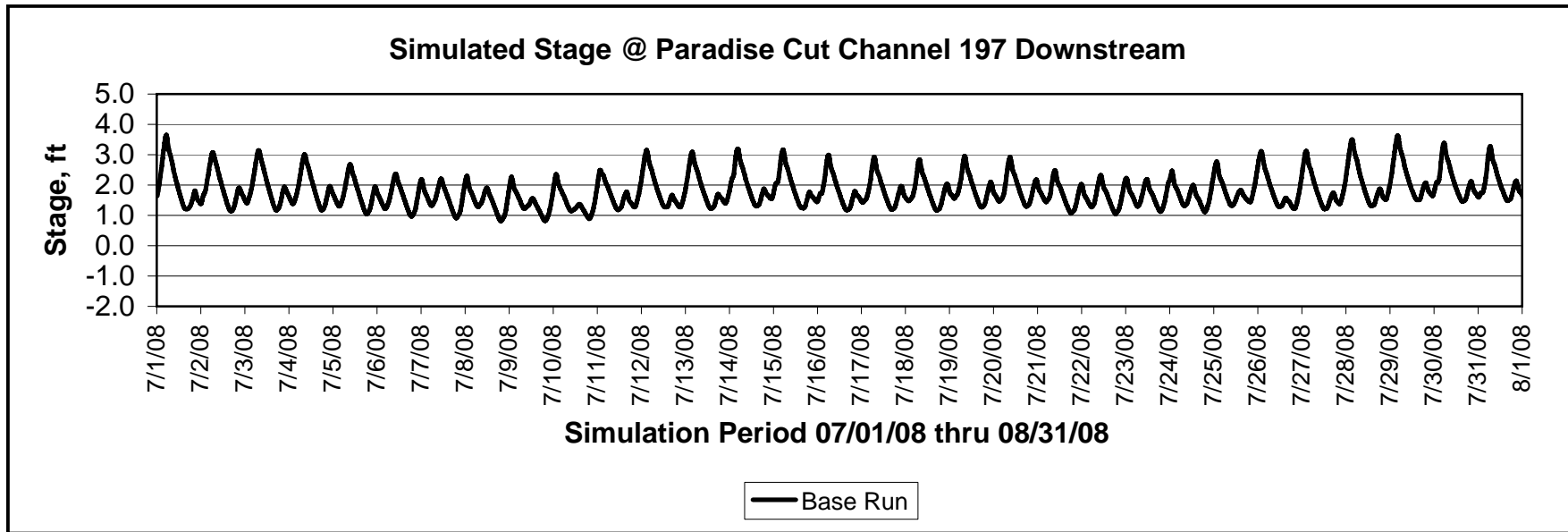


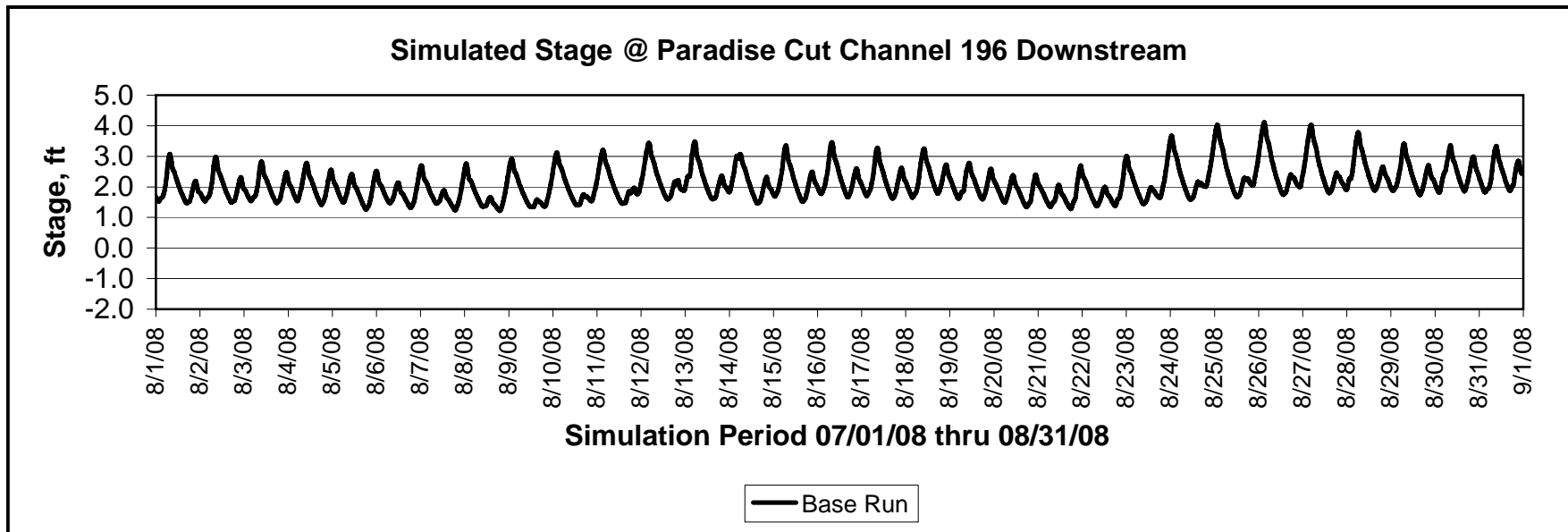
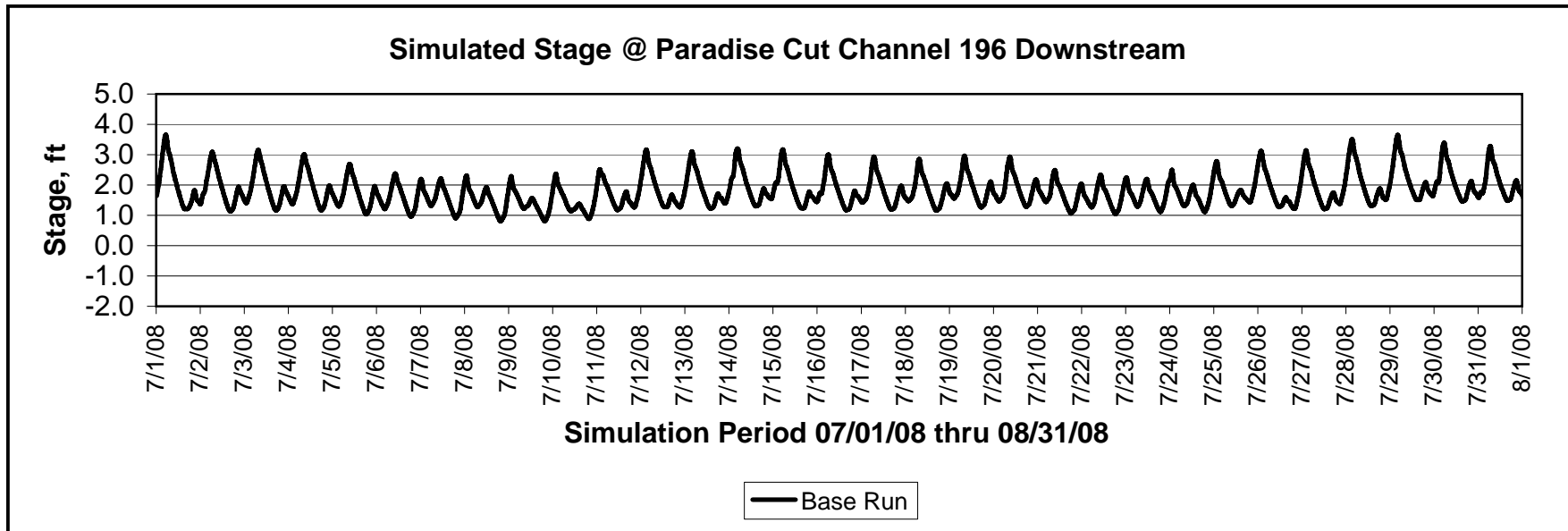


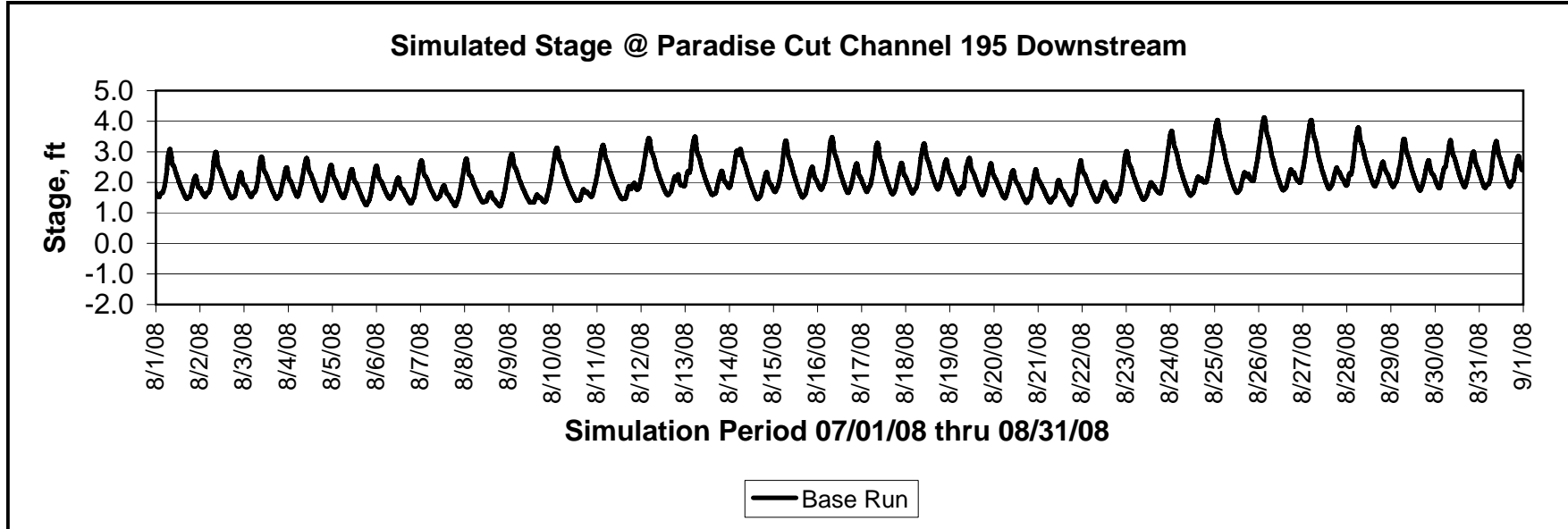
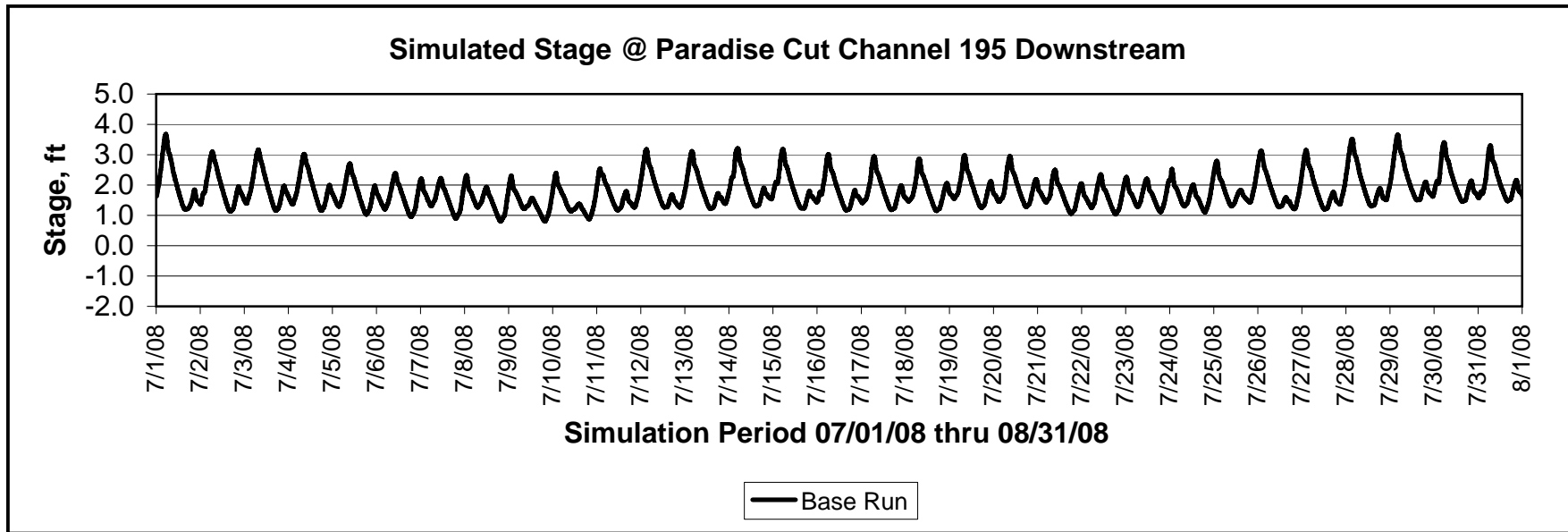




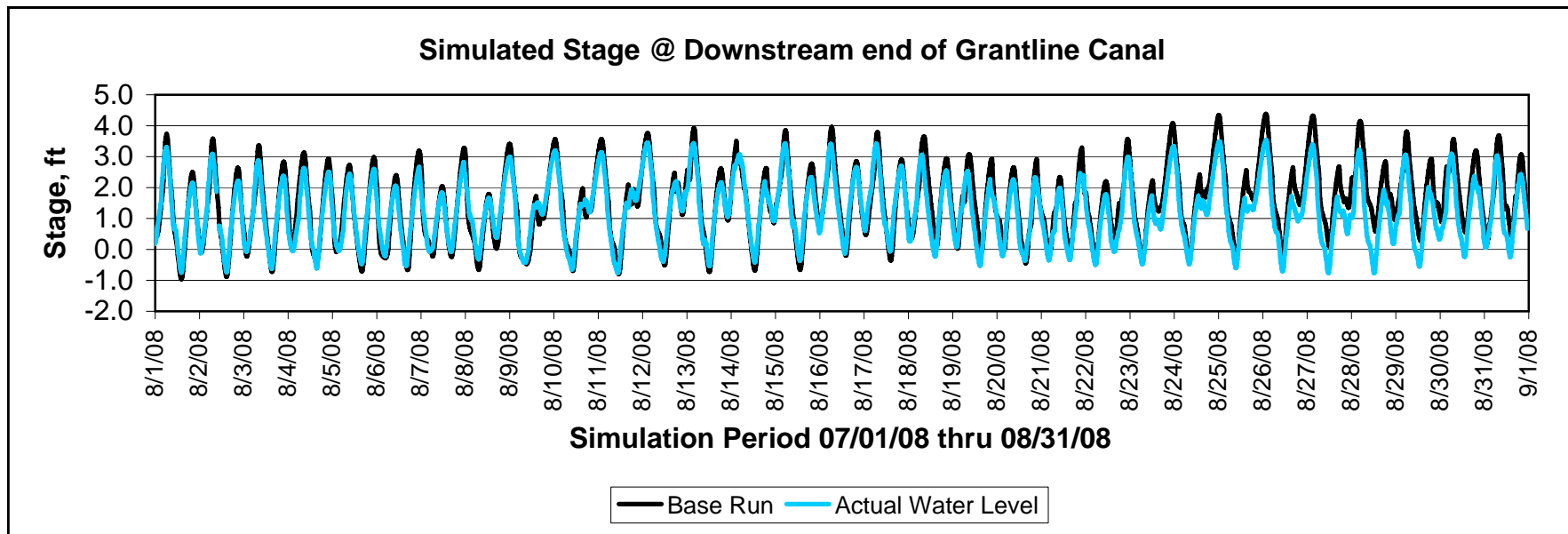
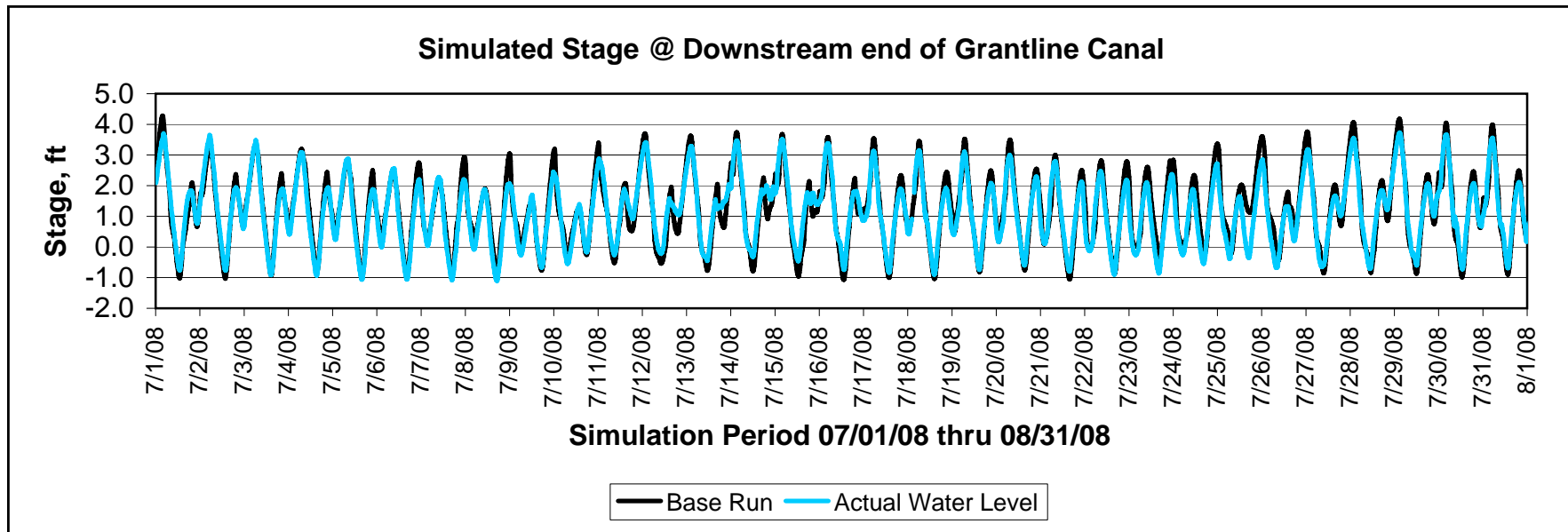


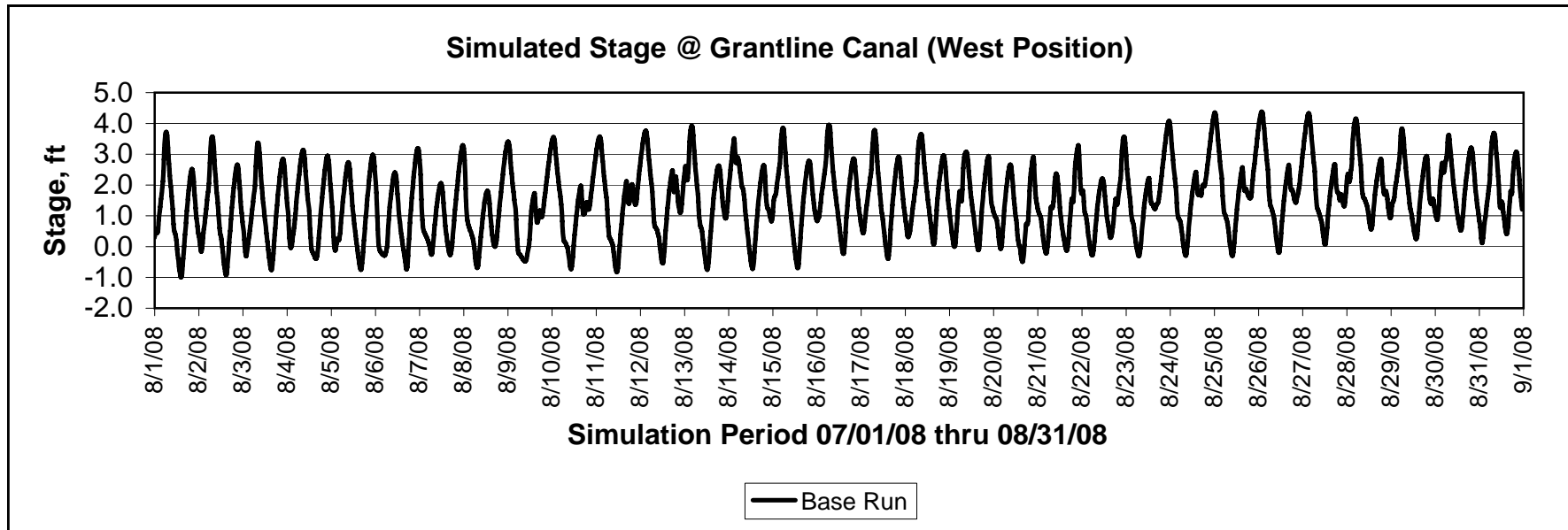
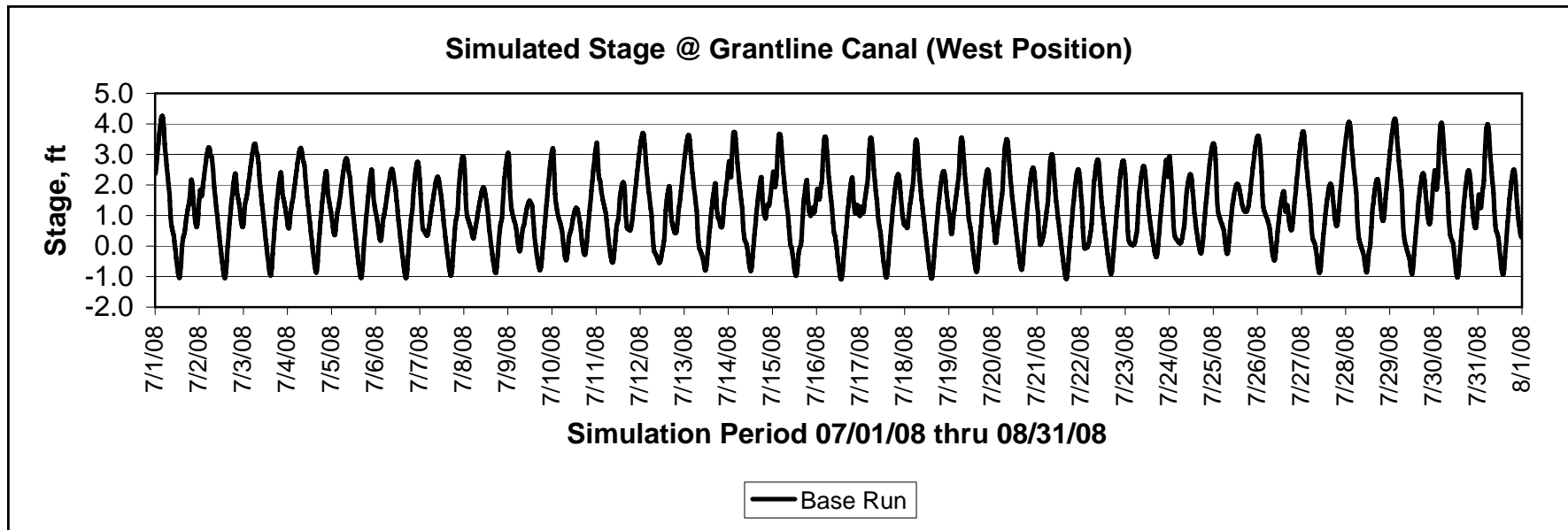


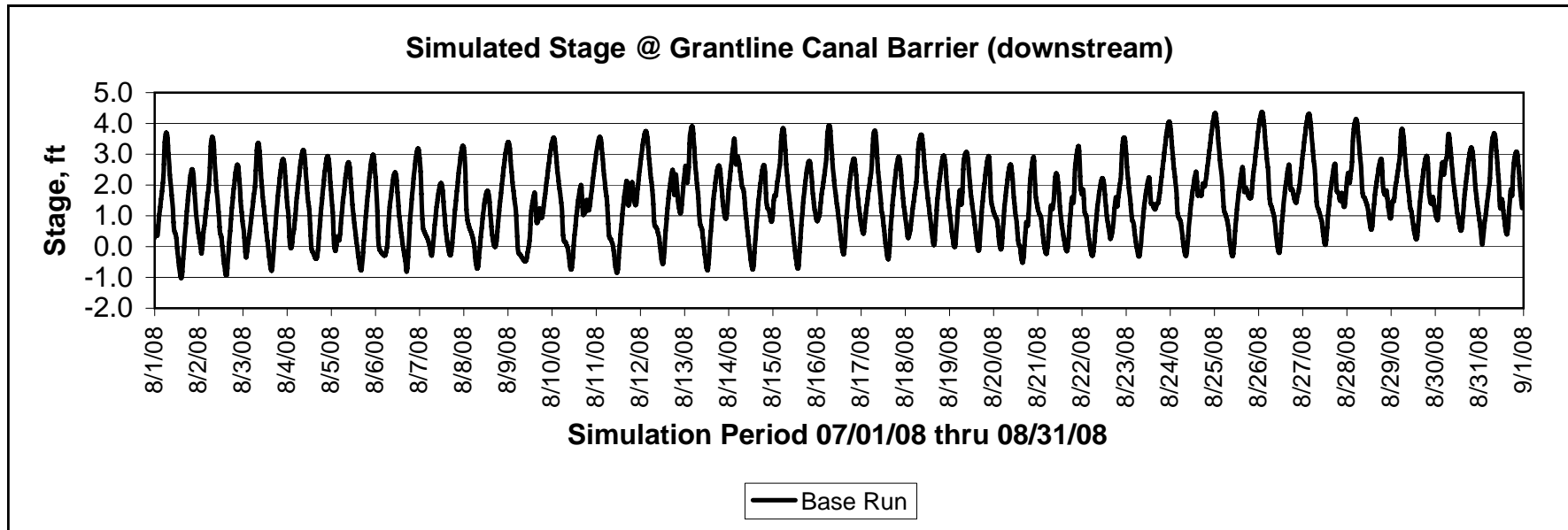
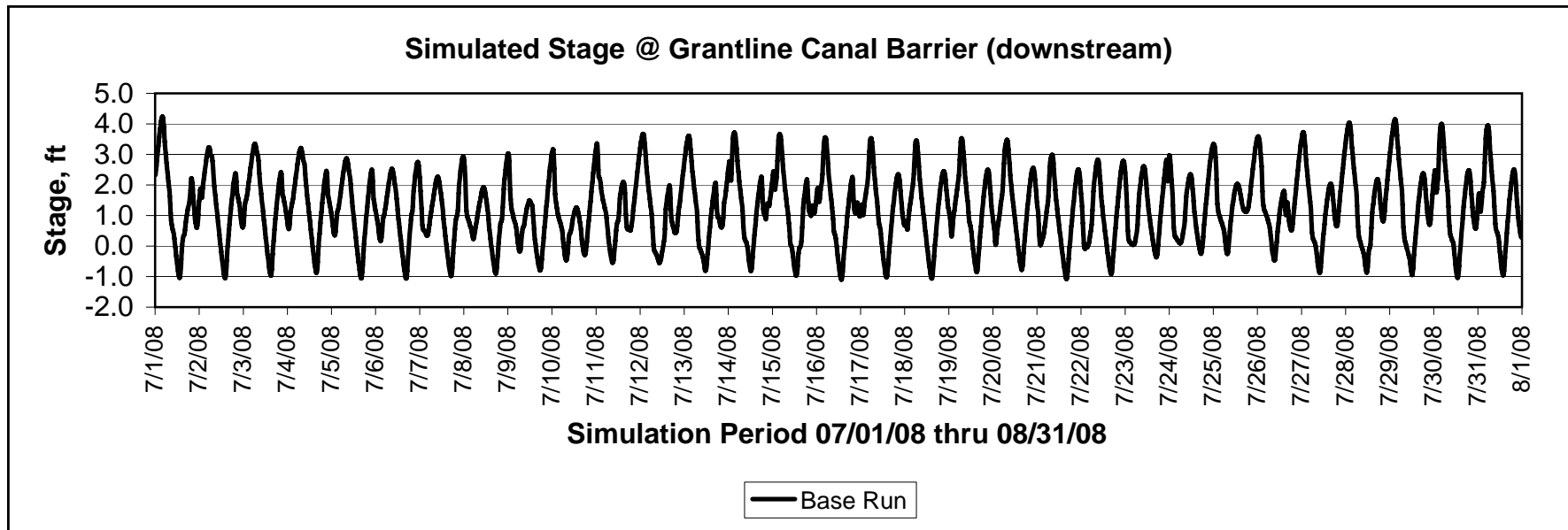


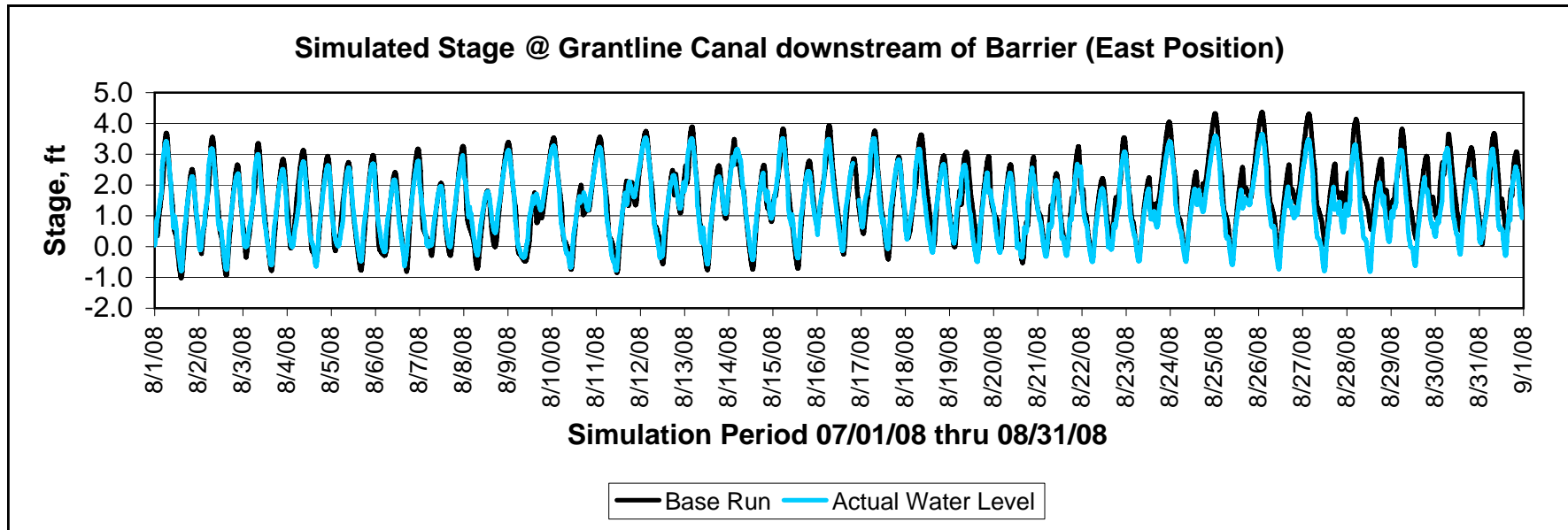
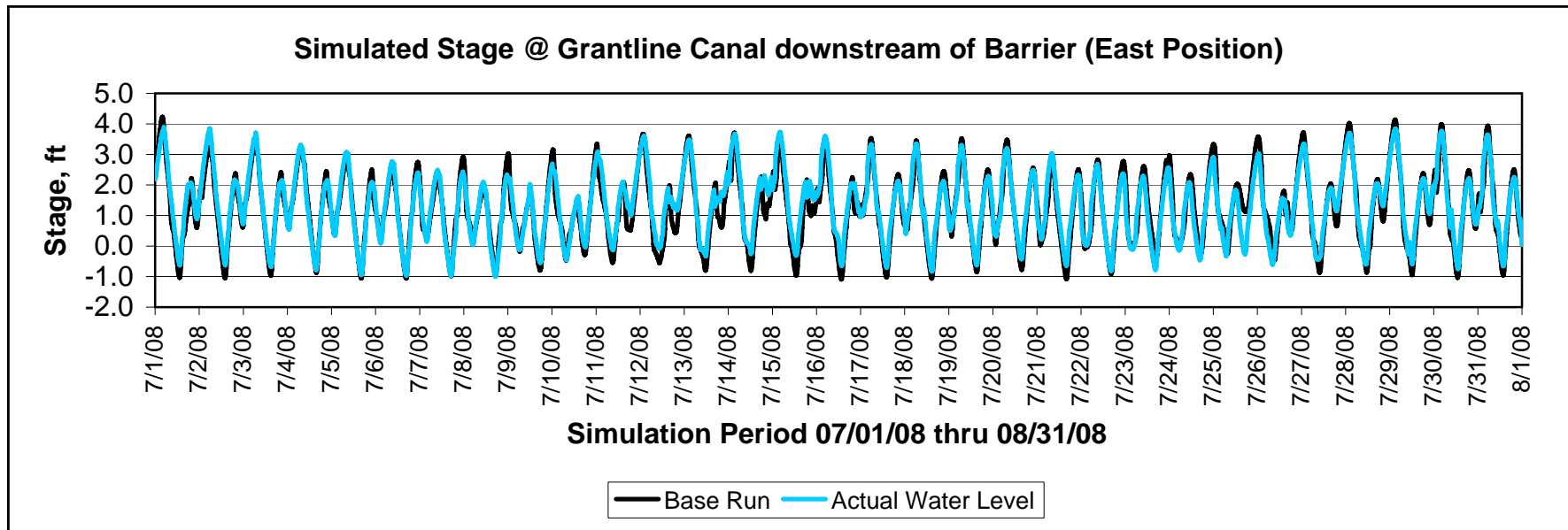


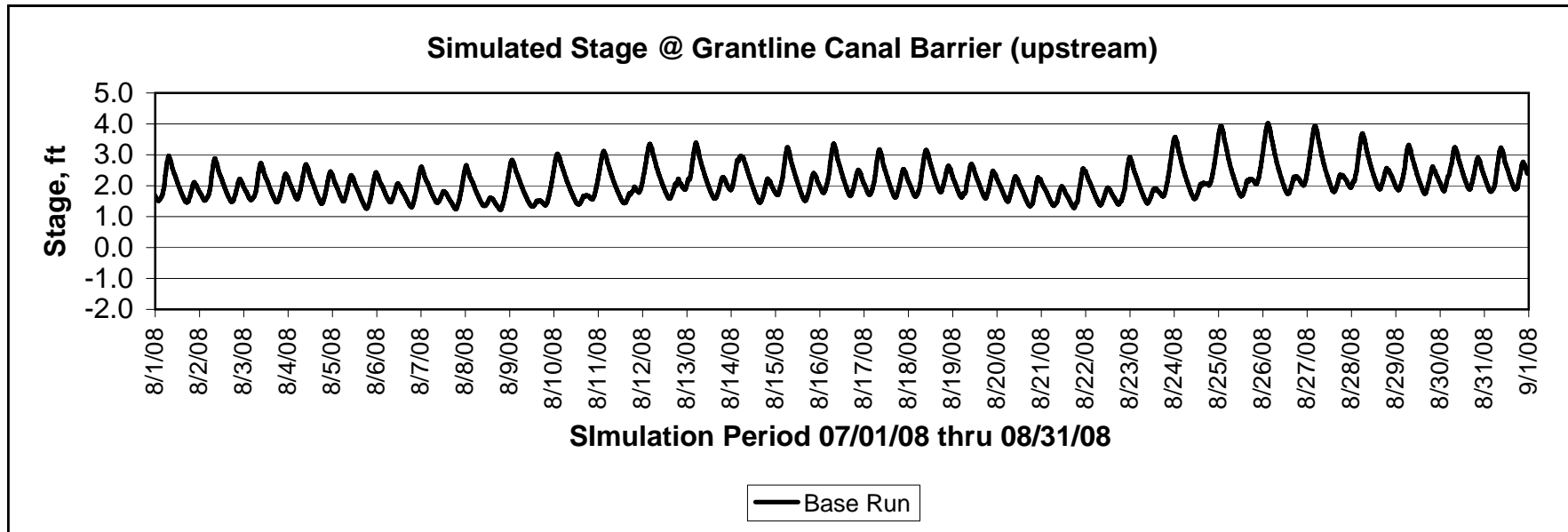
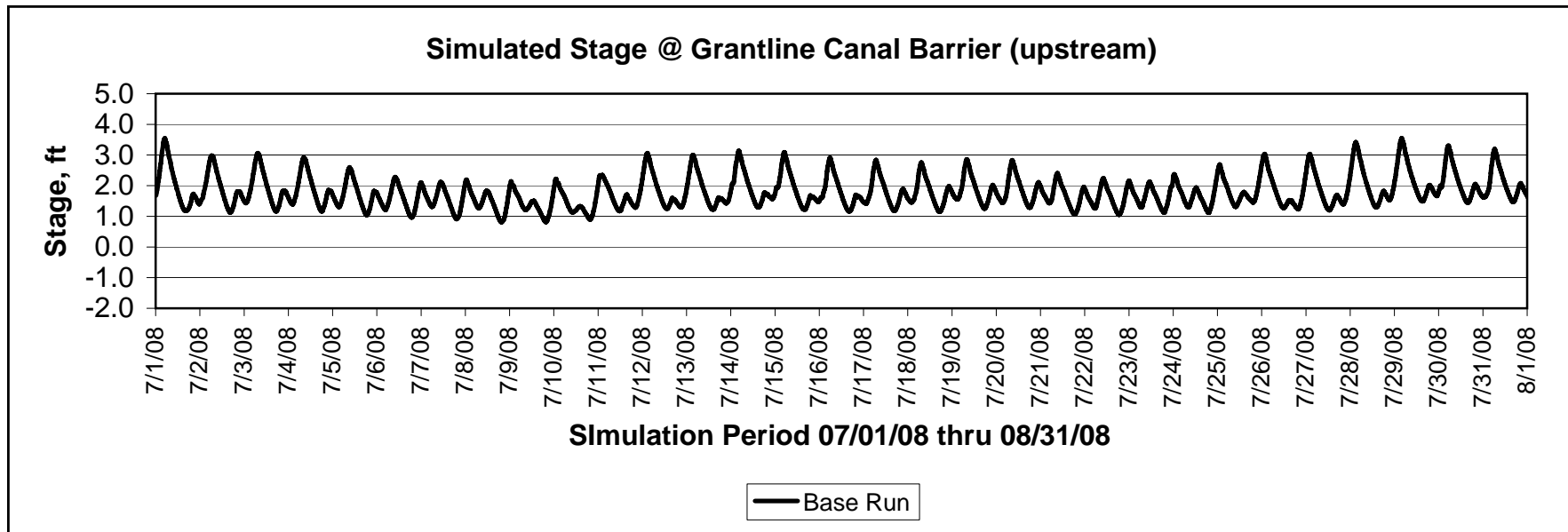
GRANTLINE CANAL - STAGE

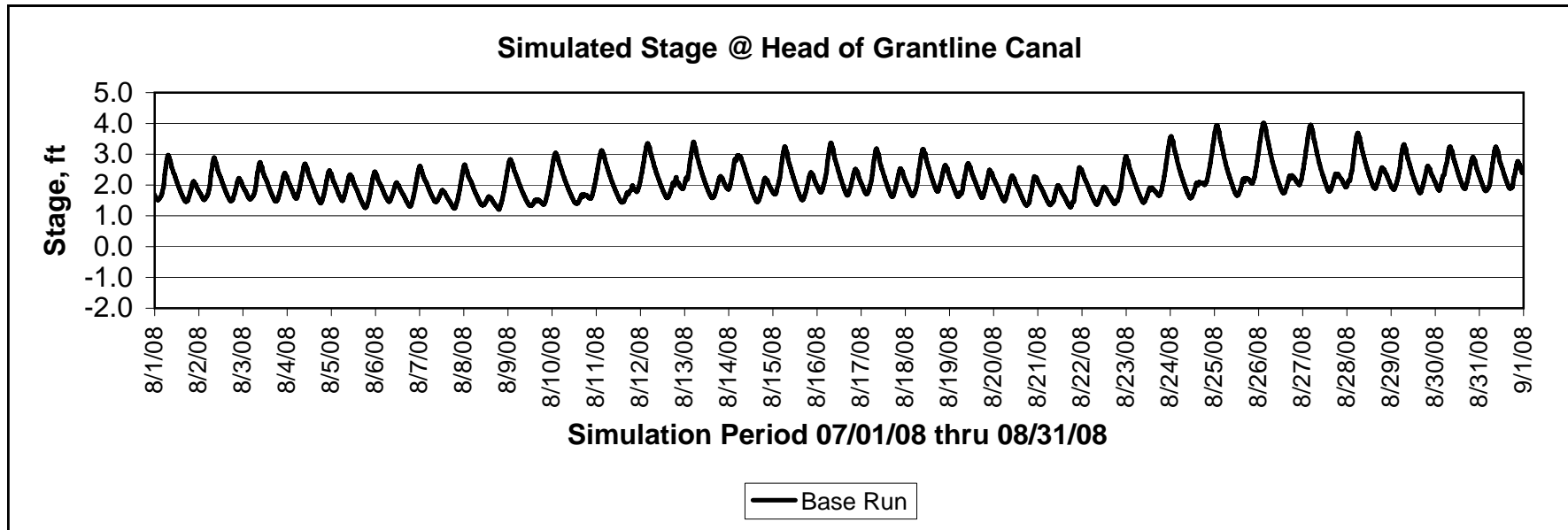
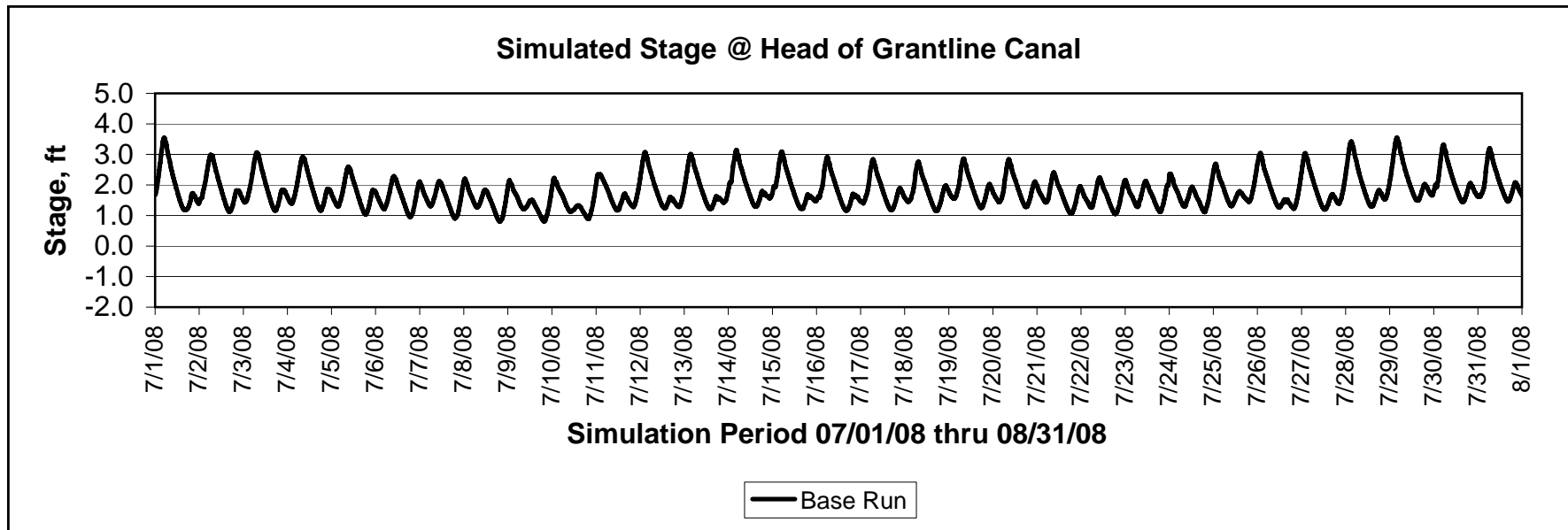


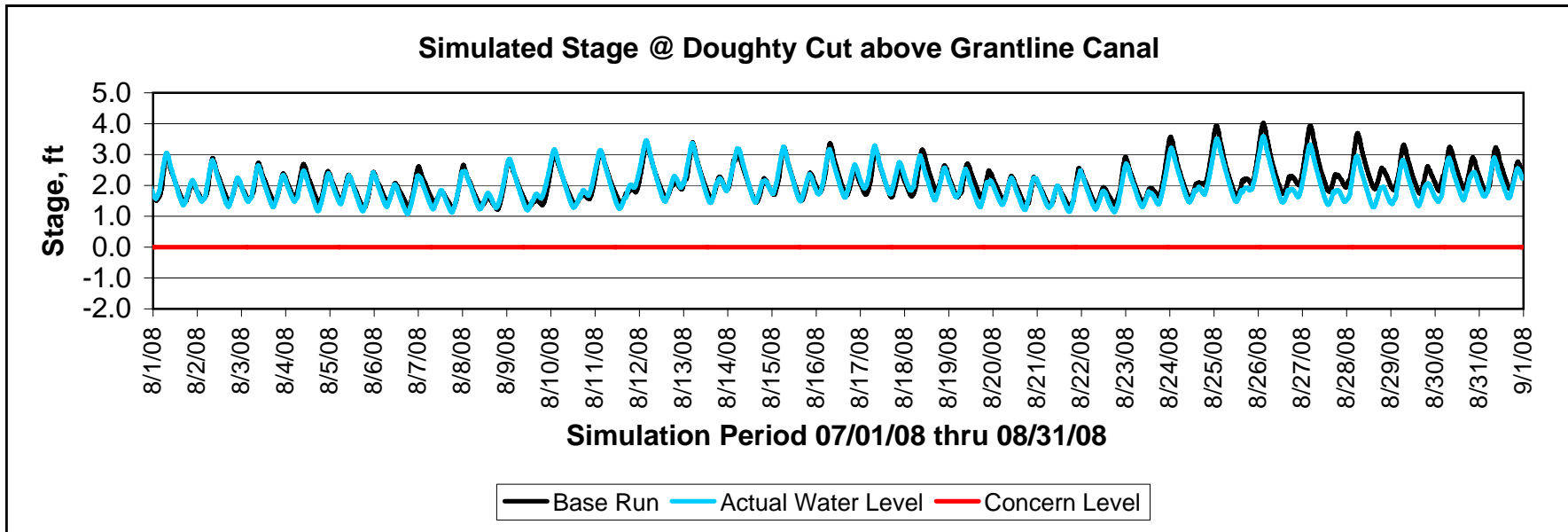
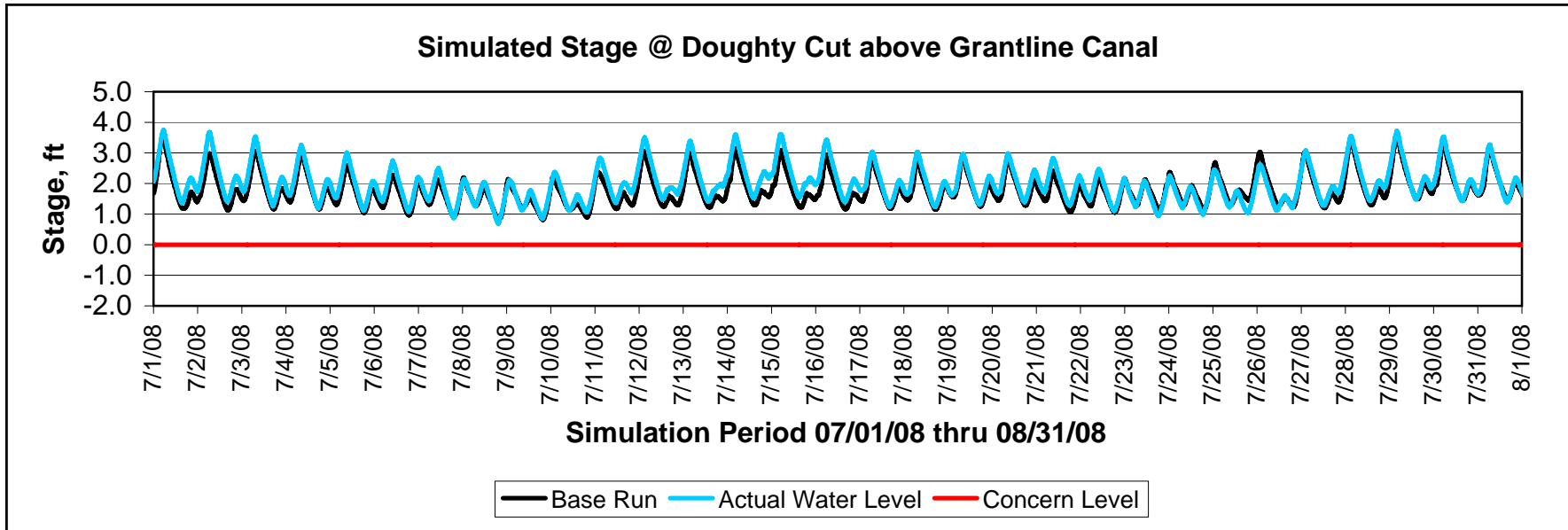




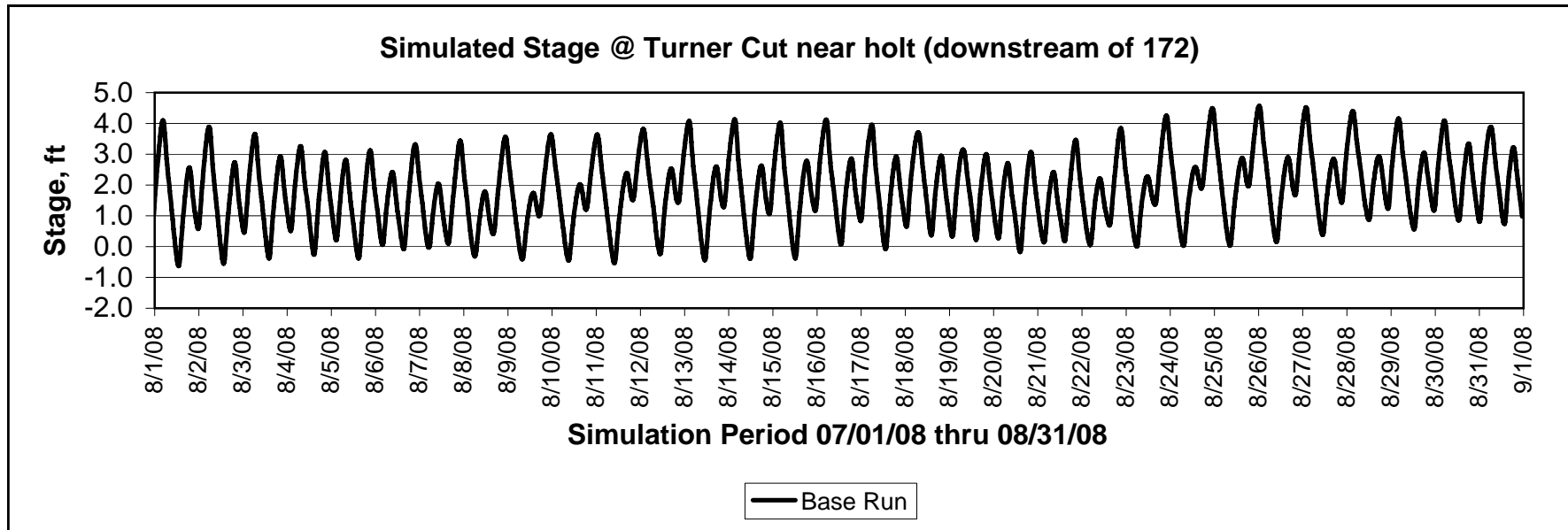
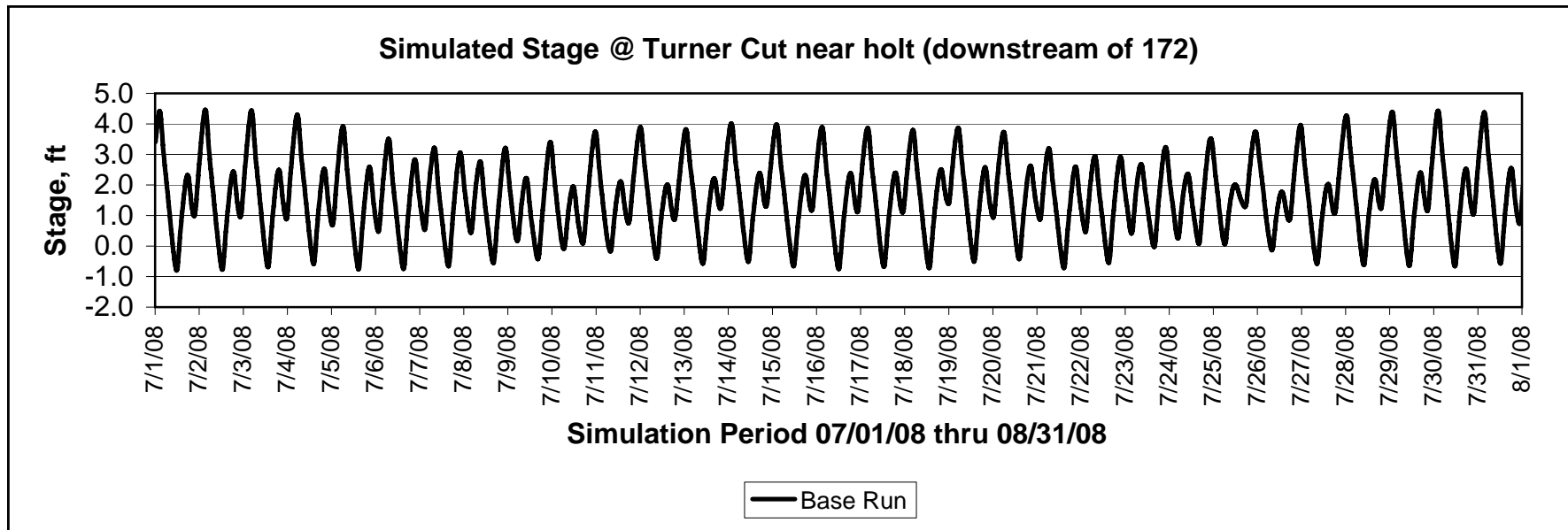


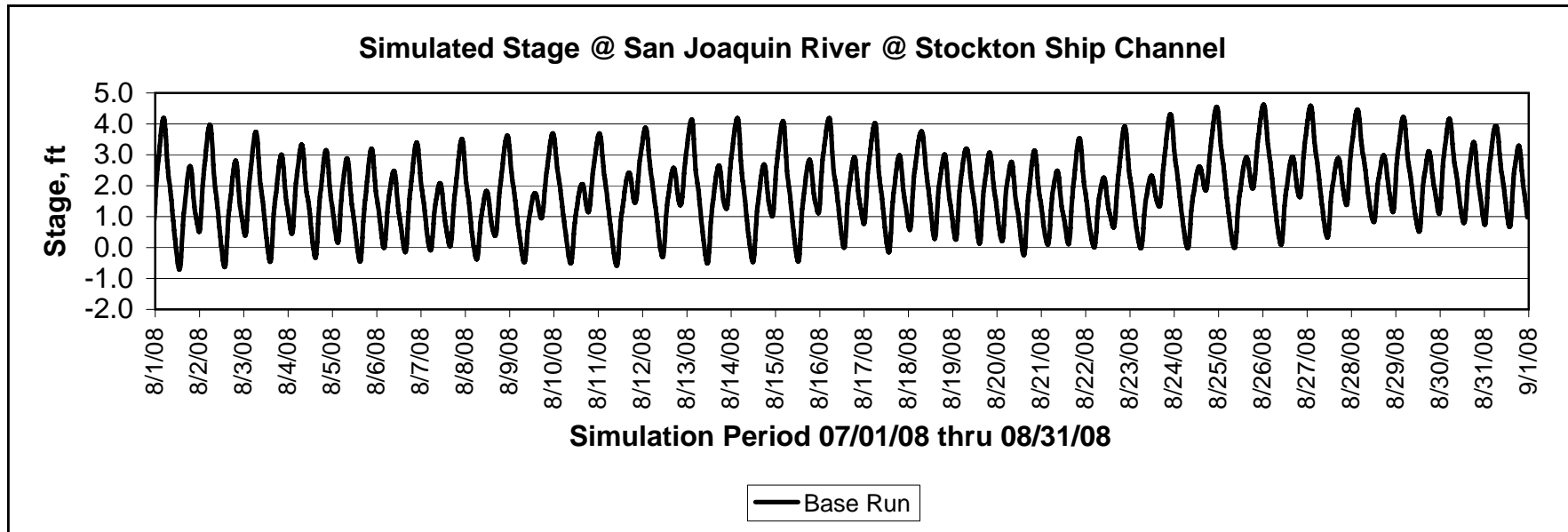
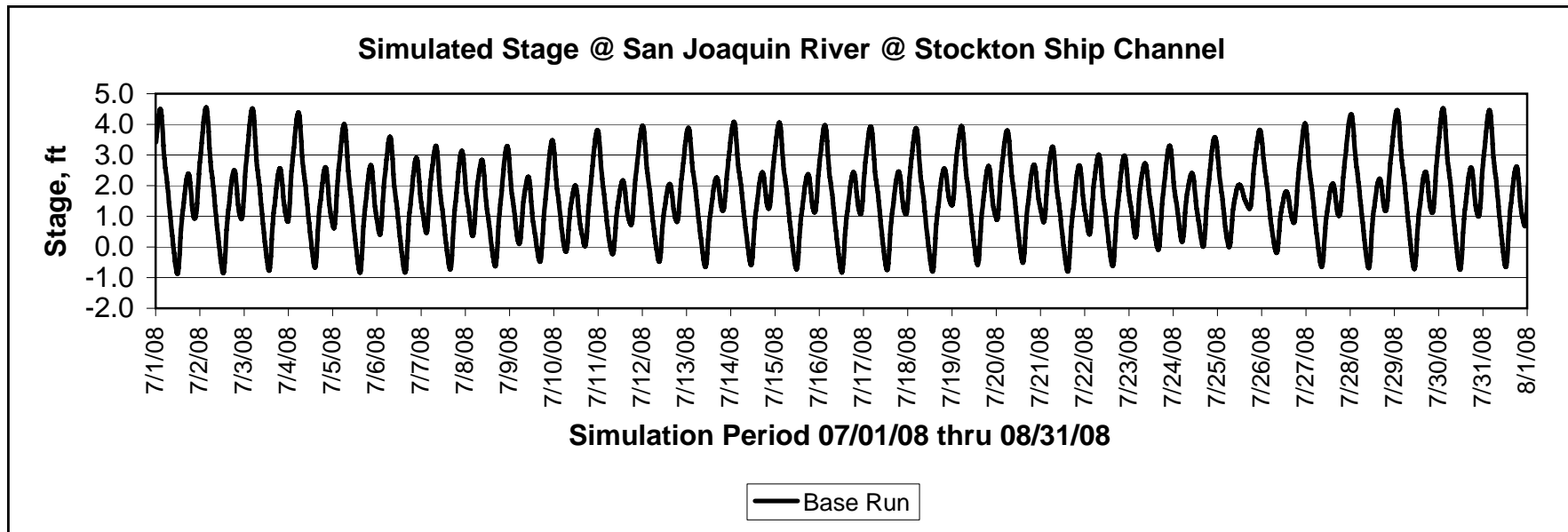


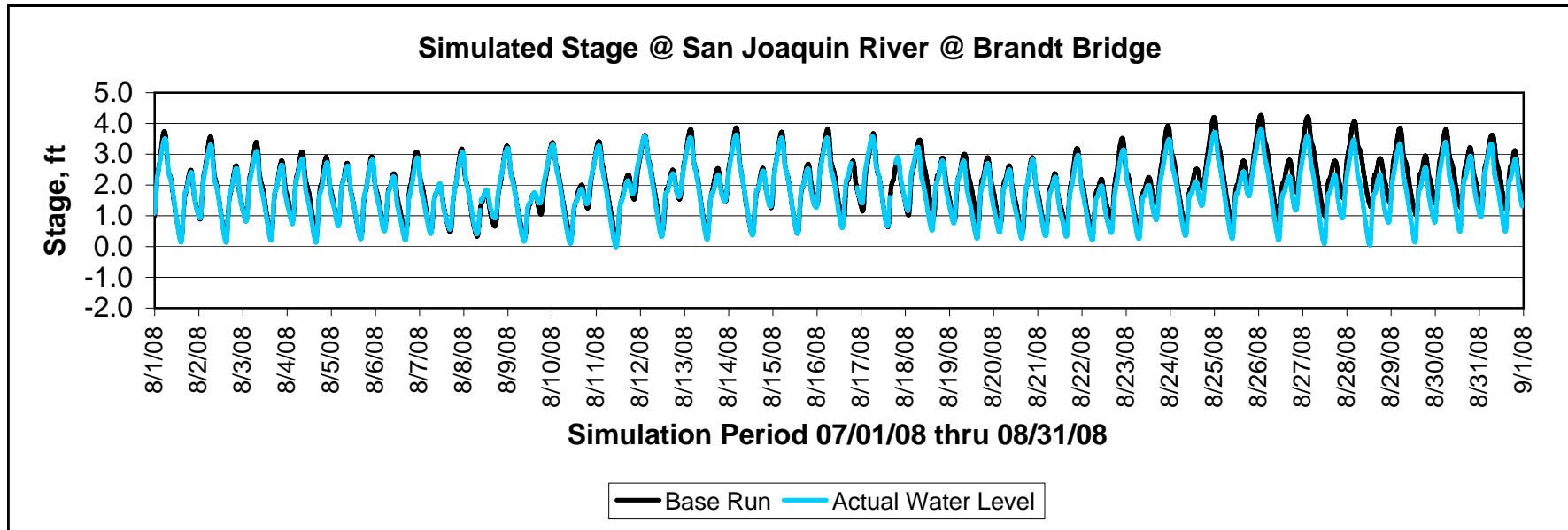
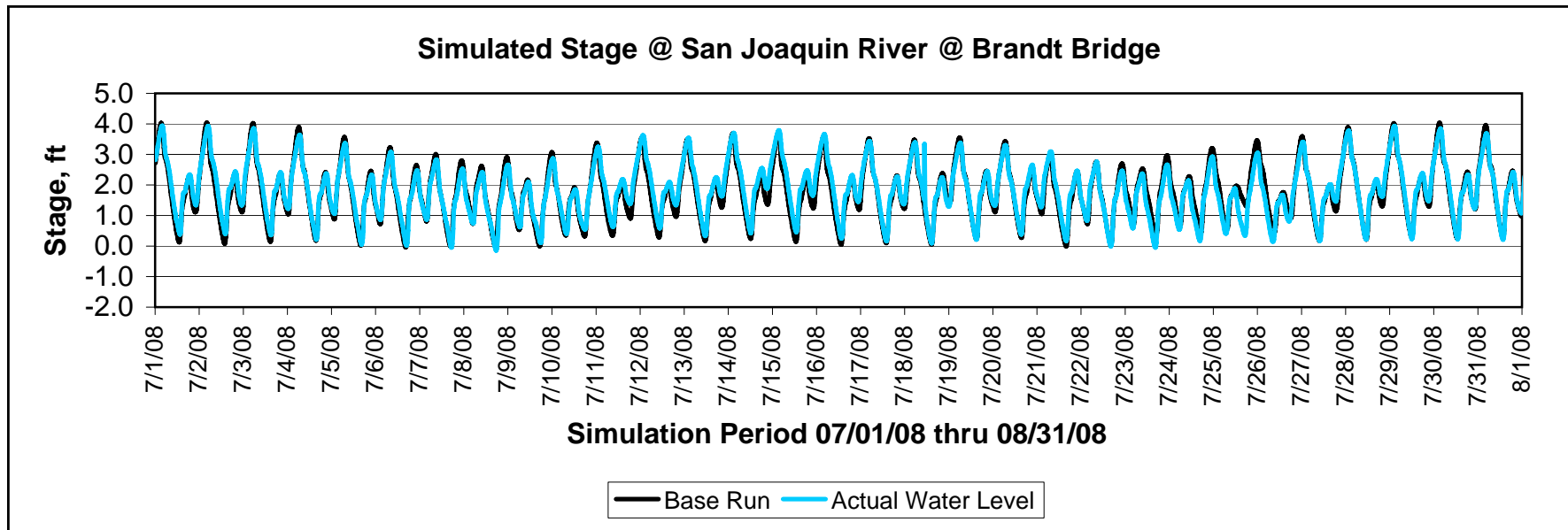


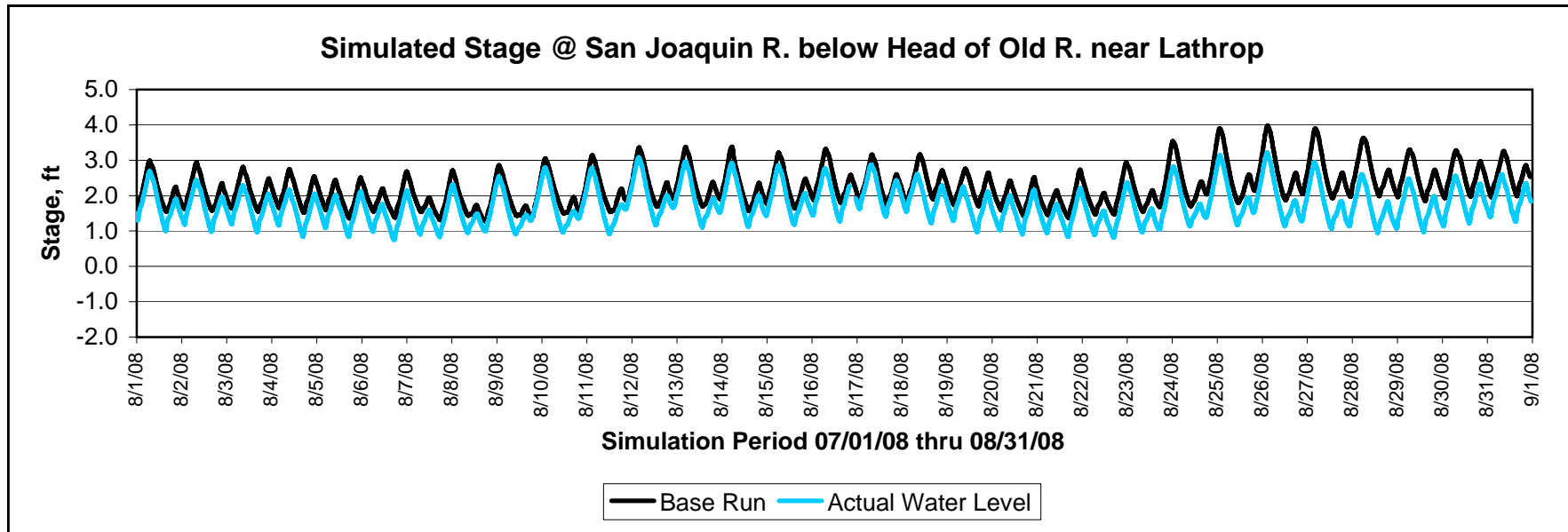
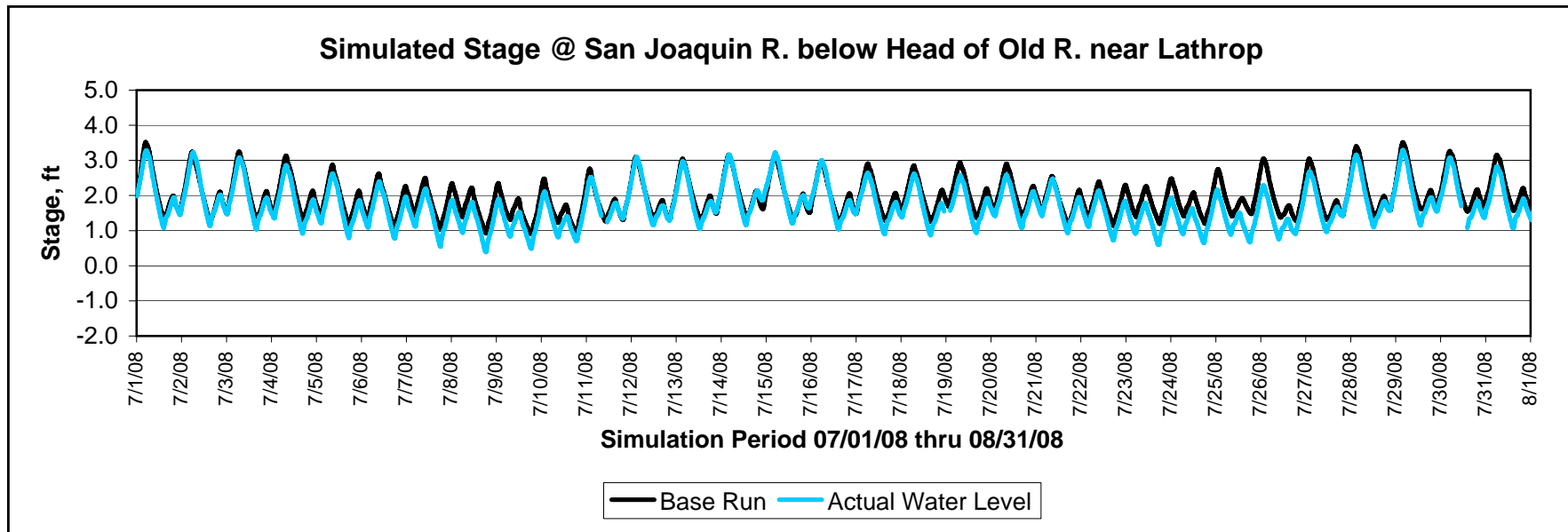


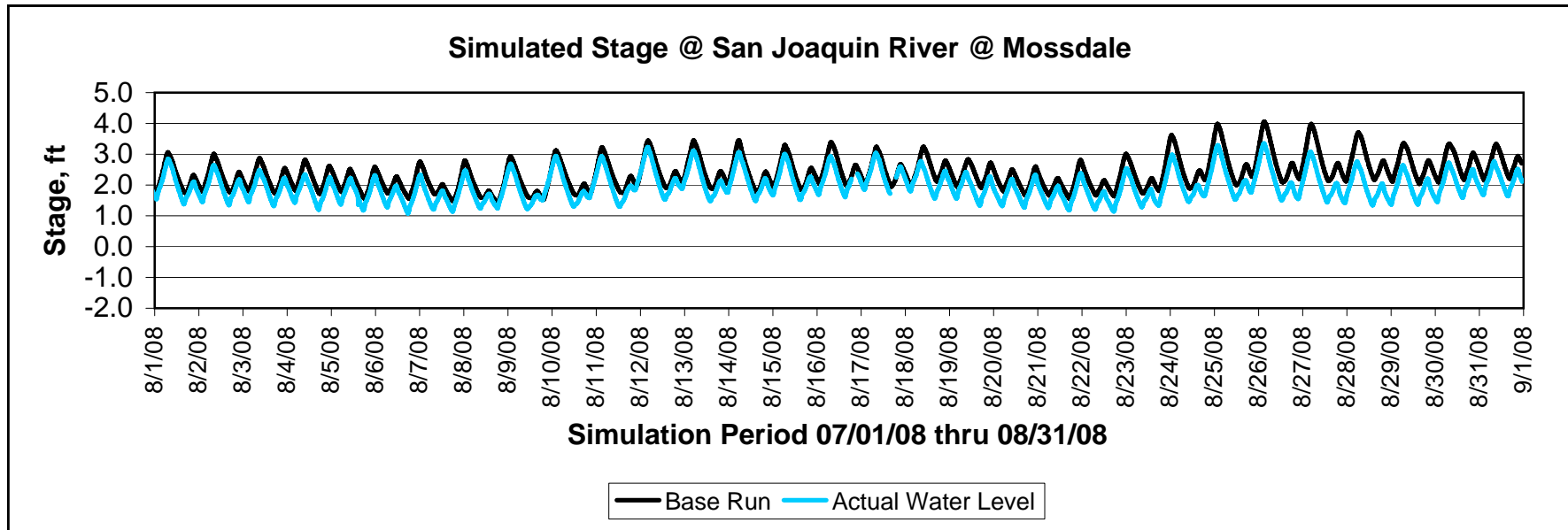
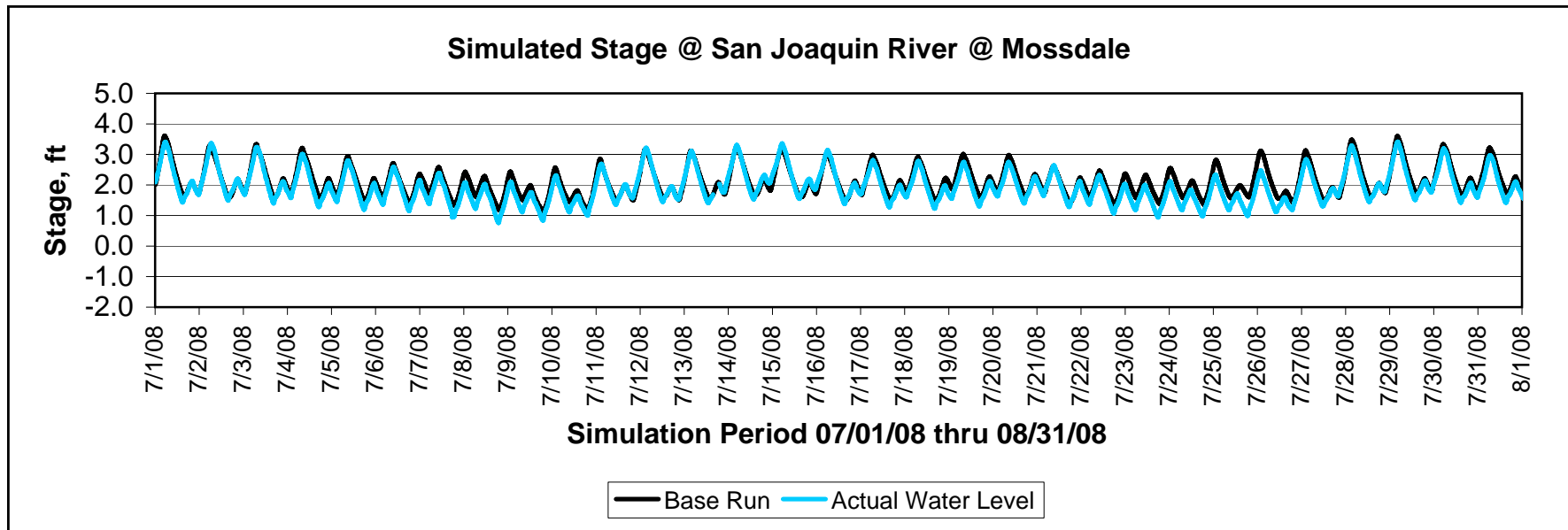
SAN JOAQUIN RIVER - STAGE





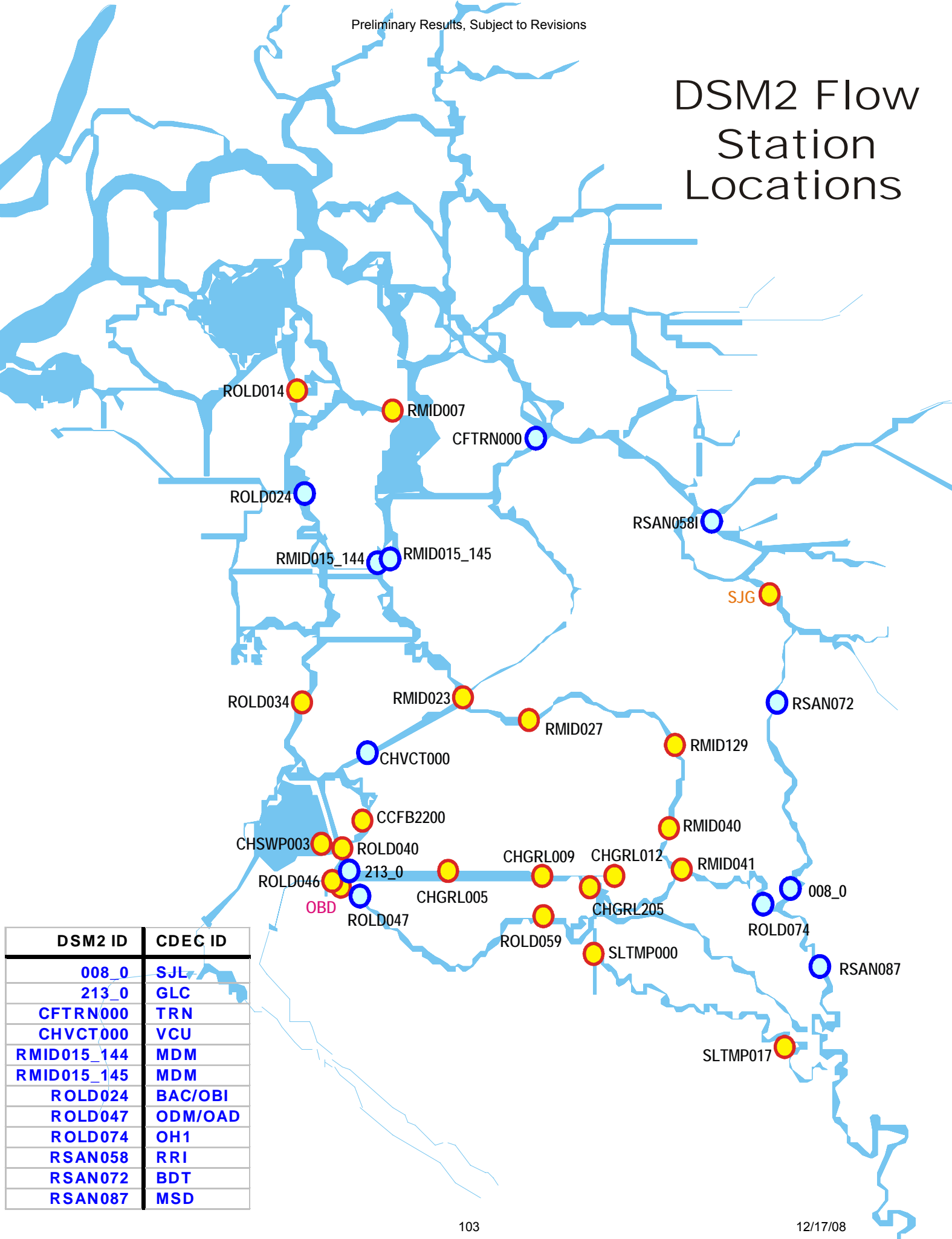






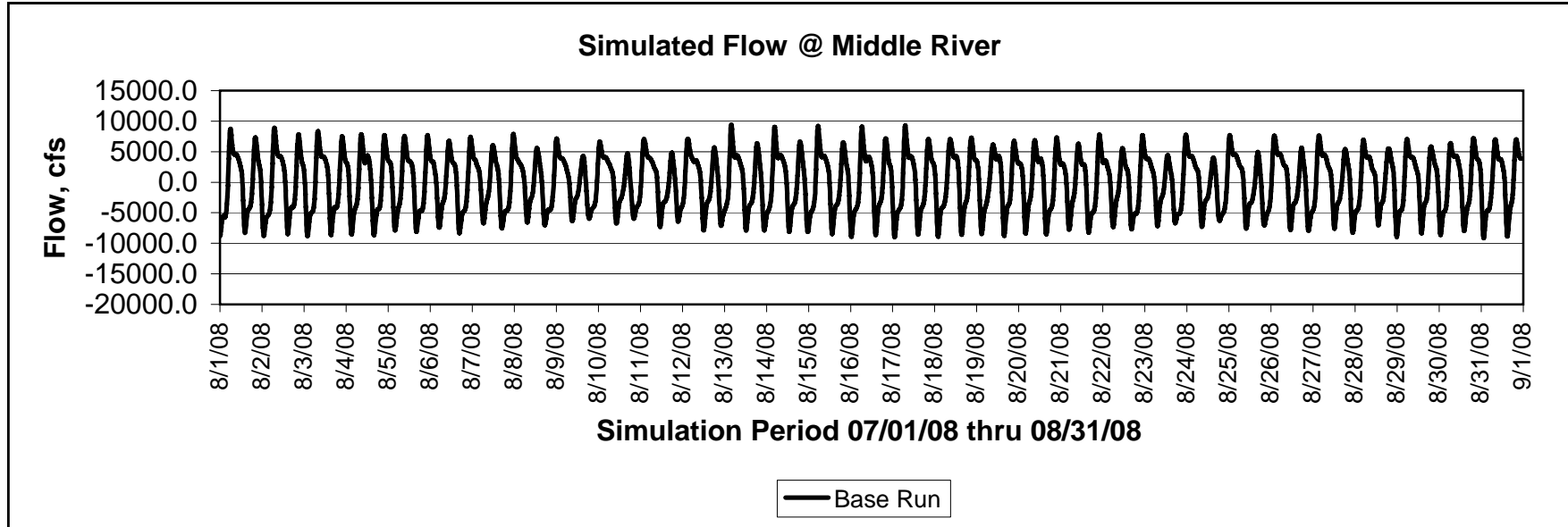
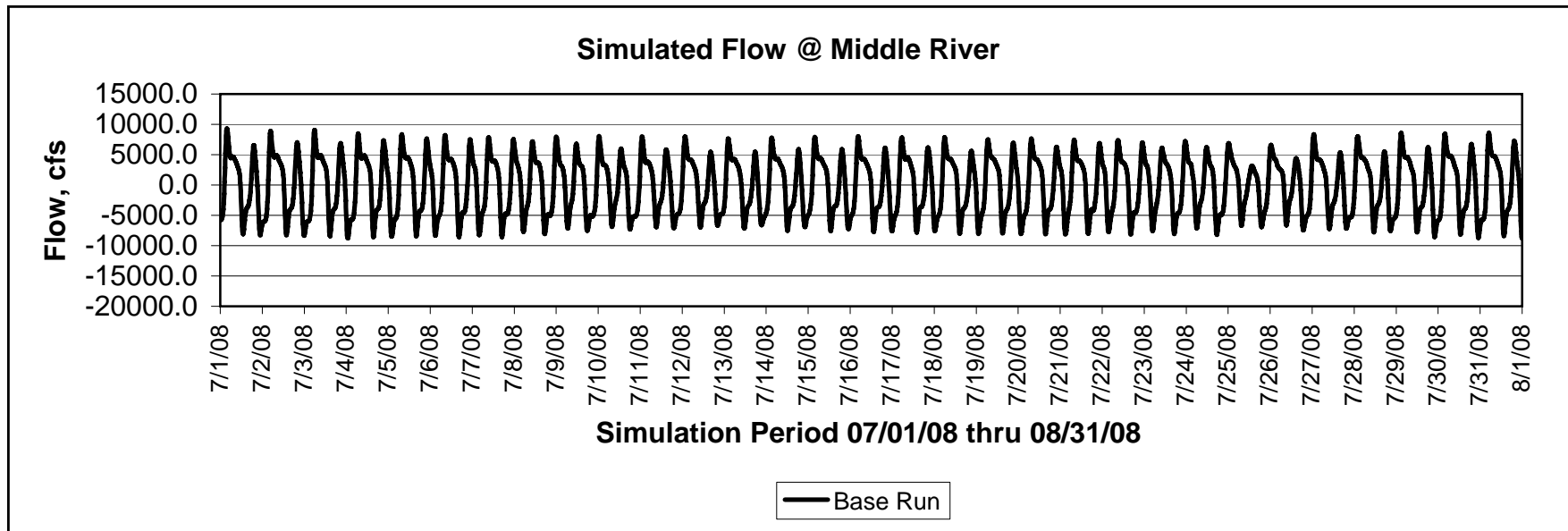
**COMPARISON OF BASELINE &
HISTORICAL FLOW
(15-MINUTE)**

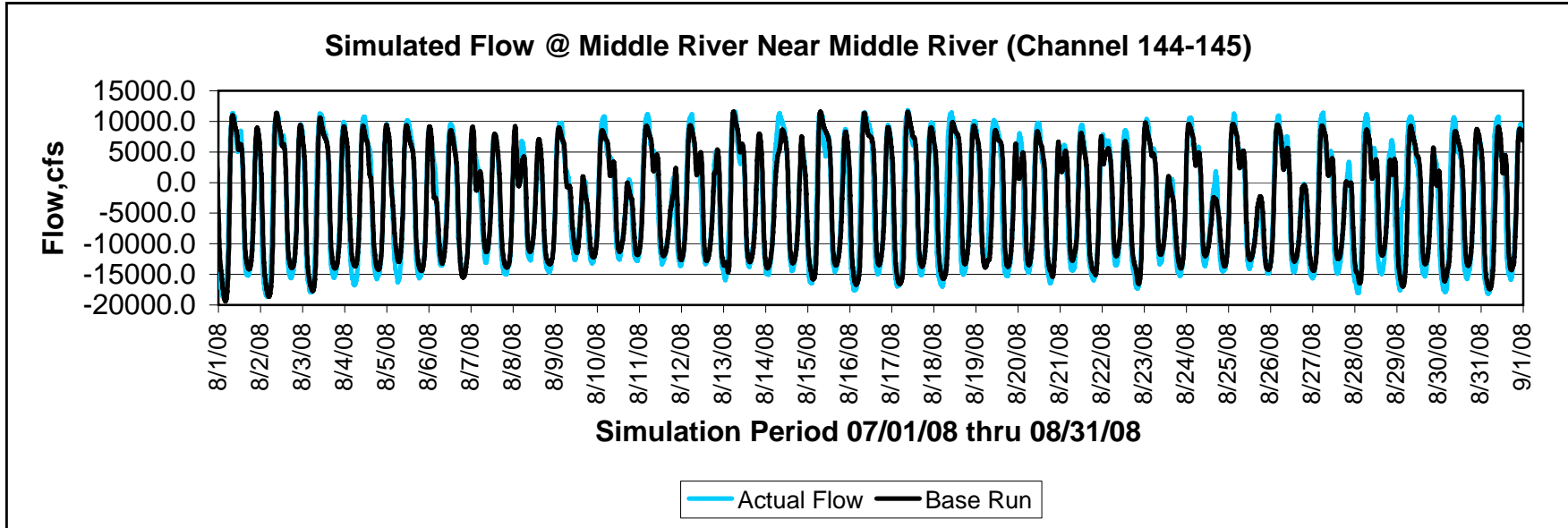
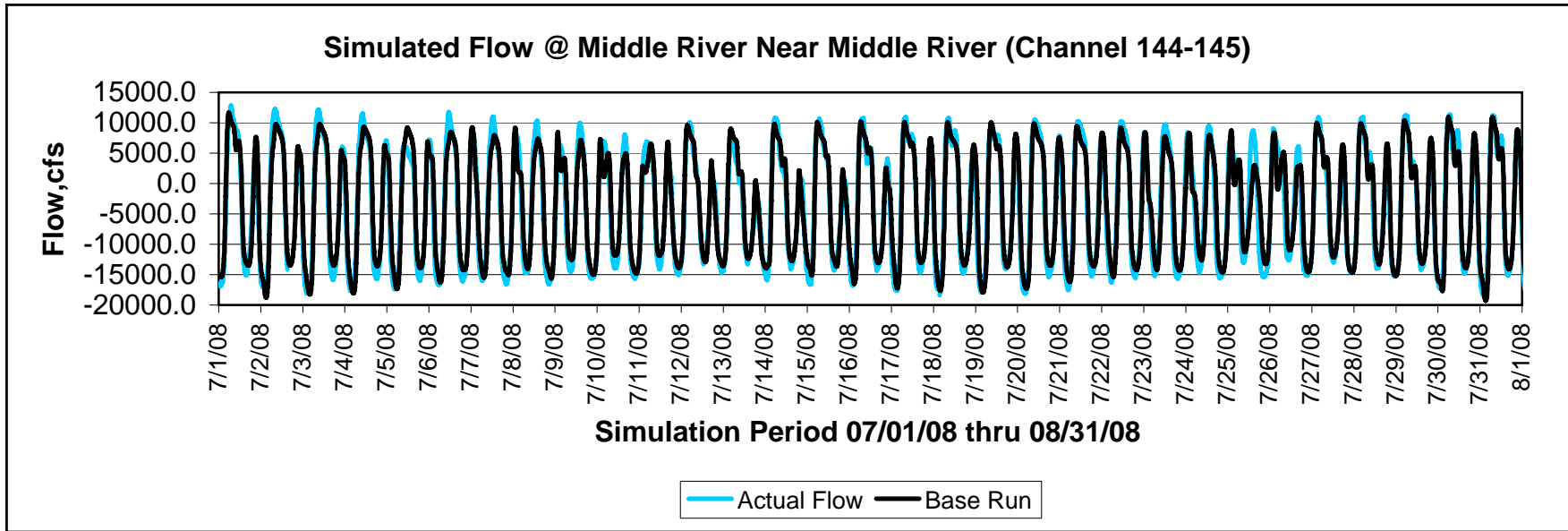
DSM2 Flow Station Locations

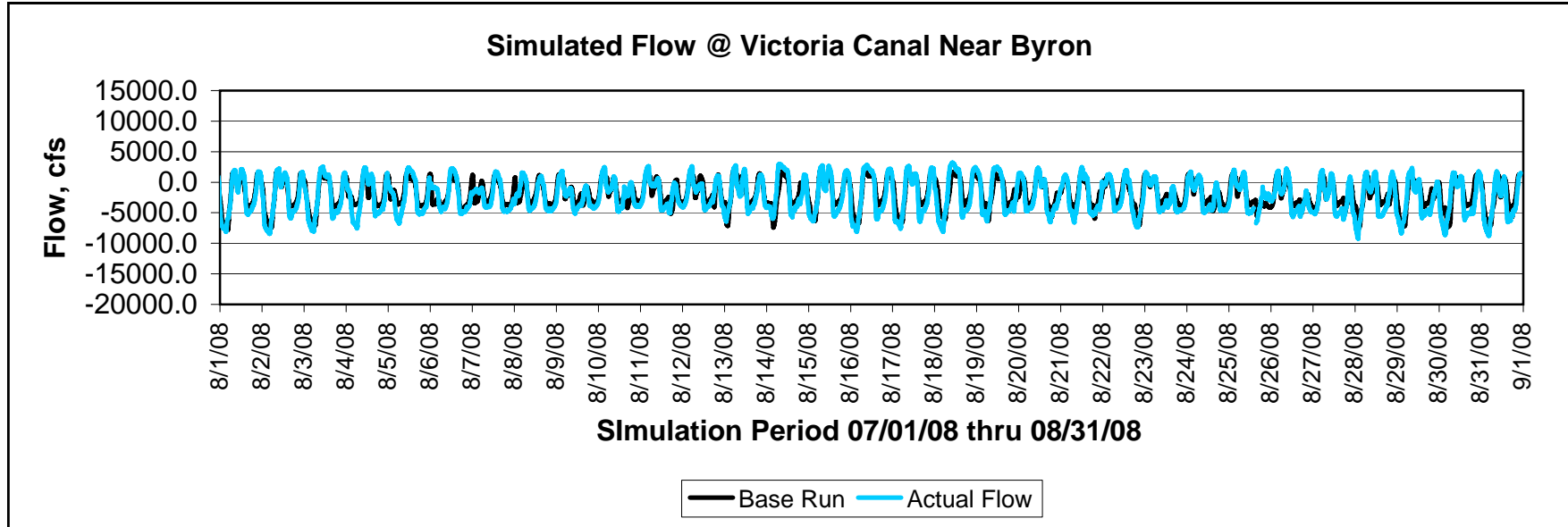
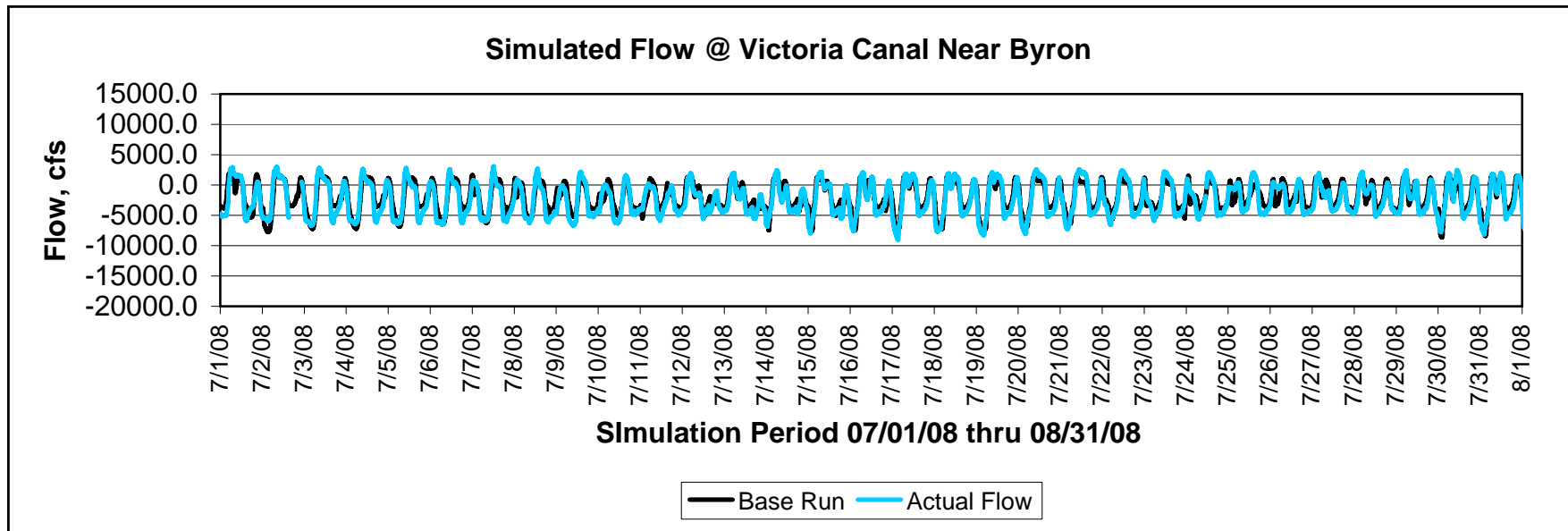


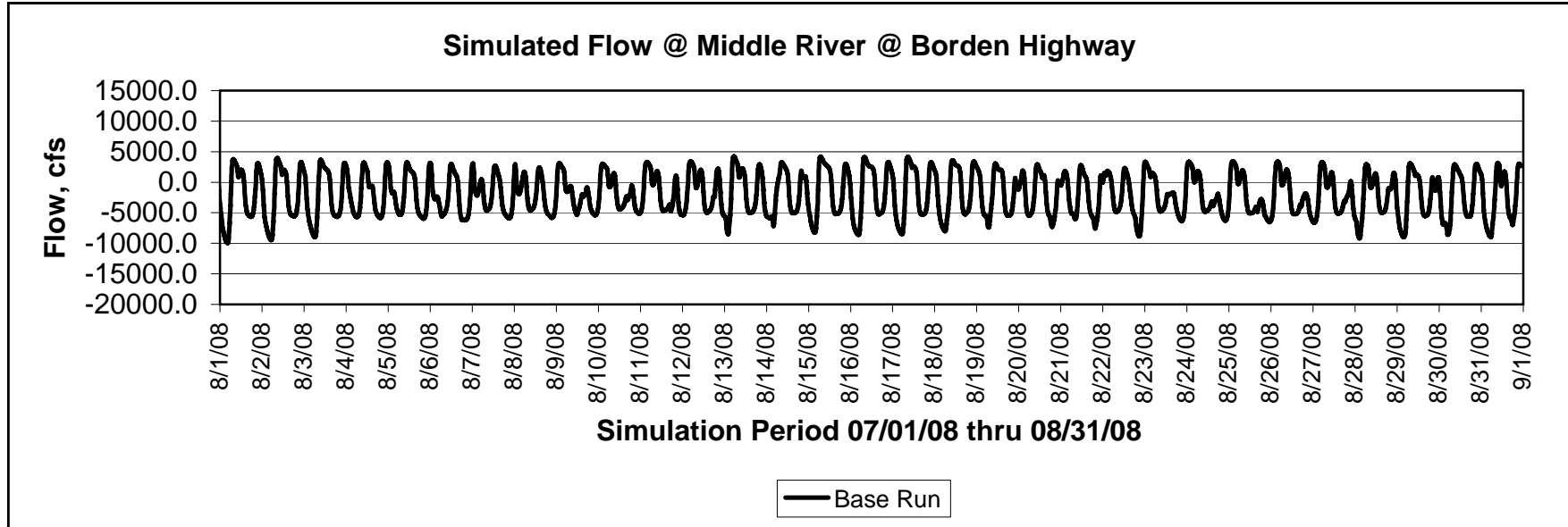
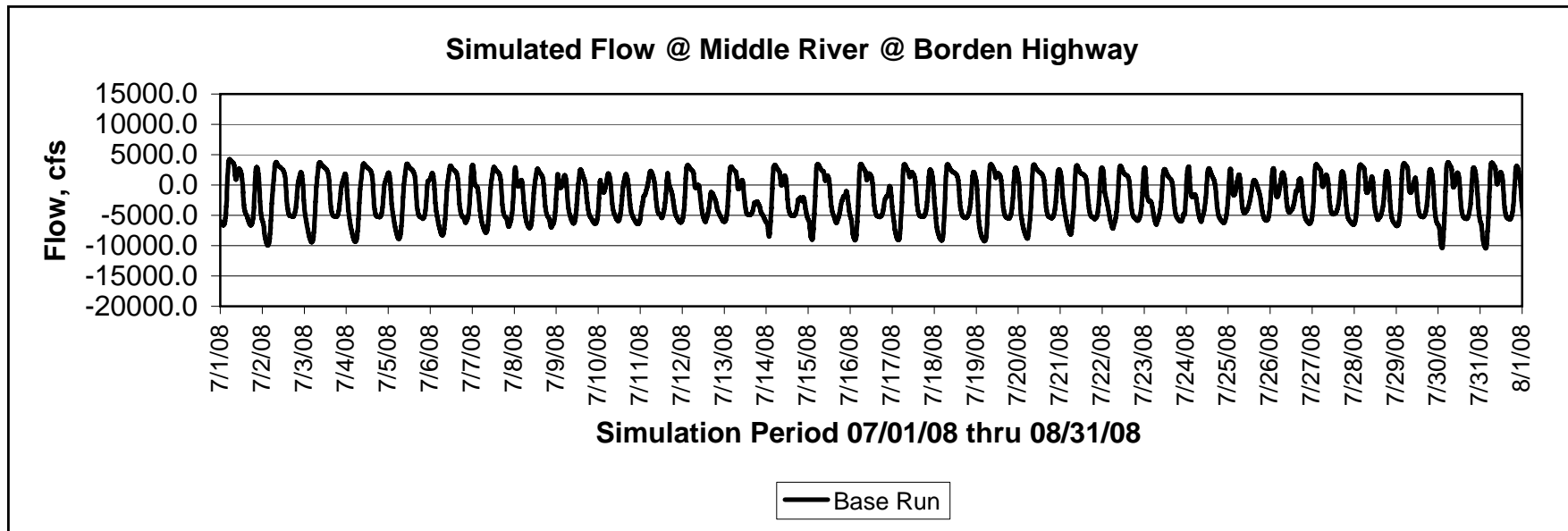
| DSM2 ID | CDEC ID |
|-------------|---------|
| 008_0 | SJL |
| 213_0 | GLC |
| CFTRN000 | TRN |
| CHVCT000 | VCU |
| RMID015_144 | MDM |
| RMID015_145 | MDM |
| ROLD024 | BAC/OBI |
| ROLD047 | ODM/OAD |
| ROLD074 | OH1 |
| RSAN058 | RRI |
| RSAN072 | BDT |
| RSAN087 | MSD |

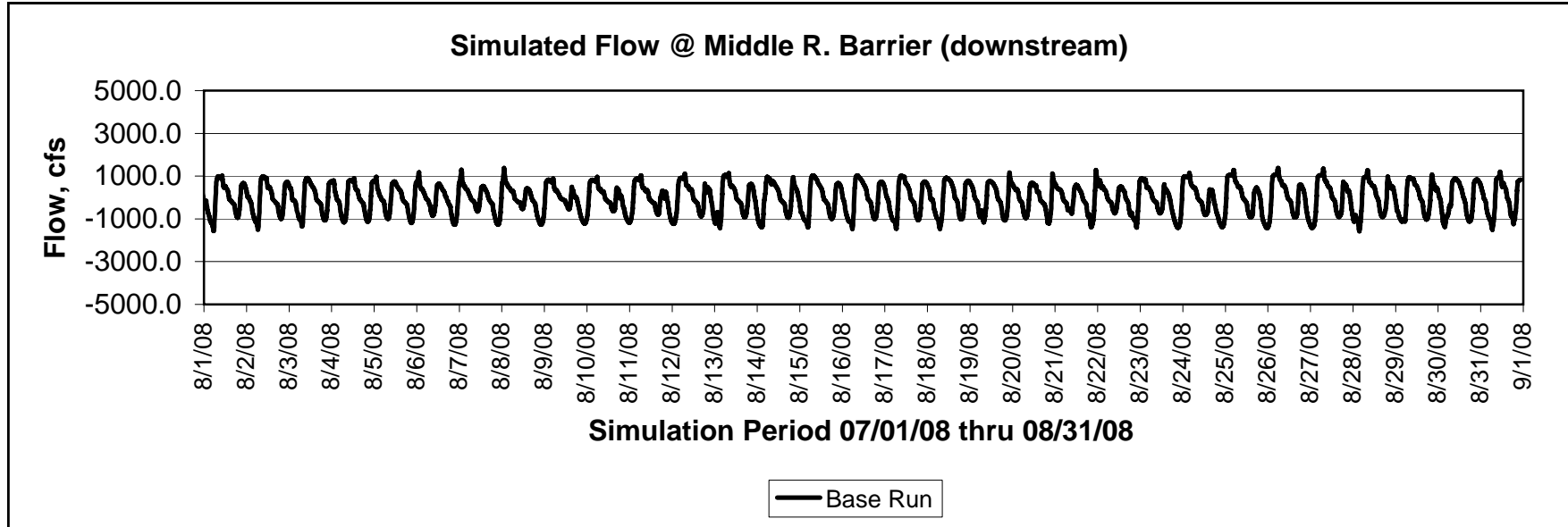
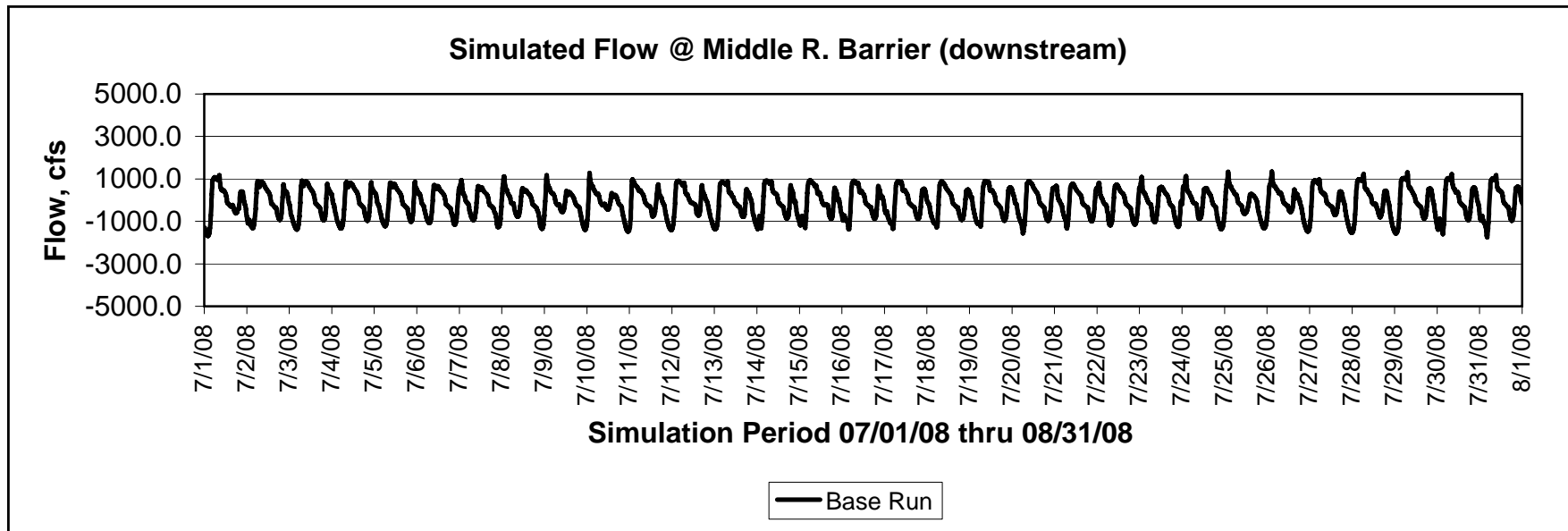
MIDDLE RIVER - FLOW

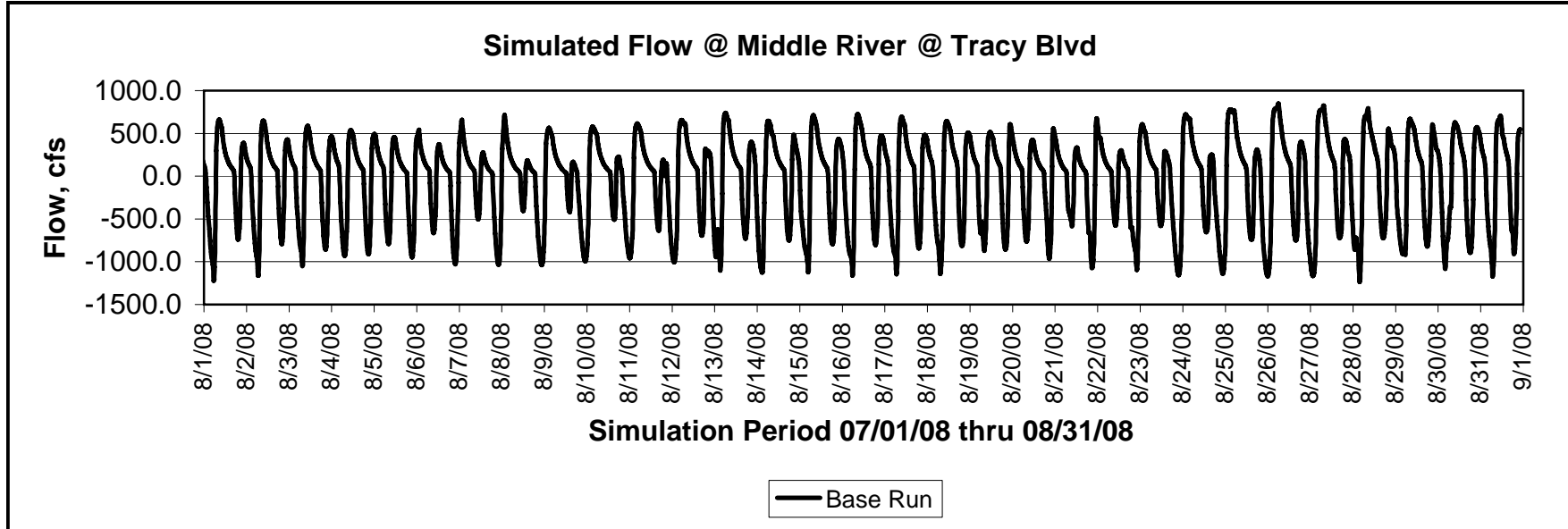
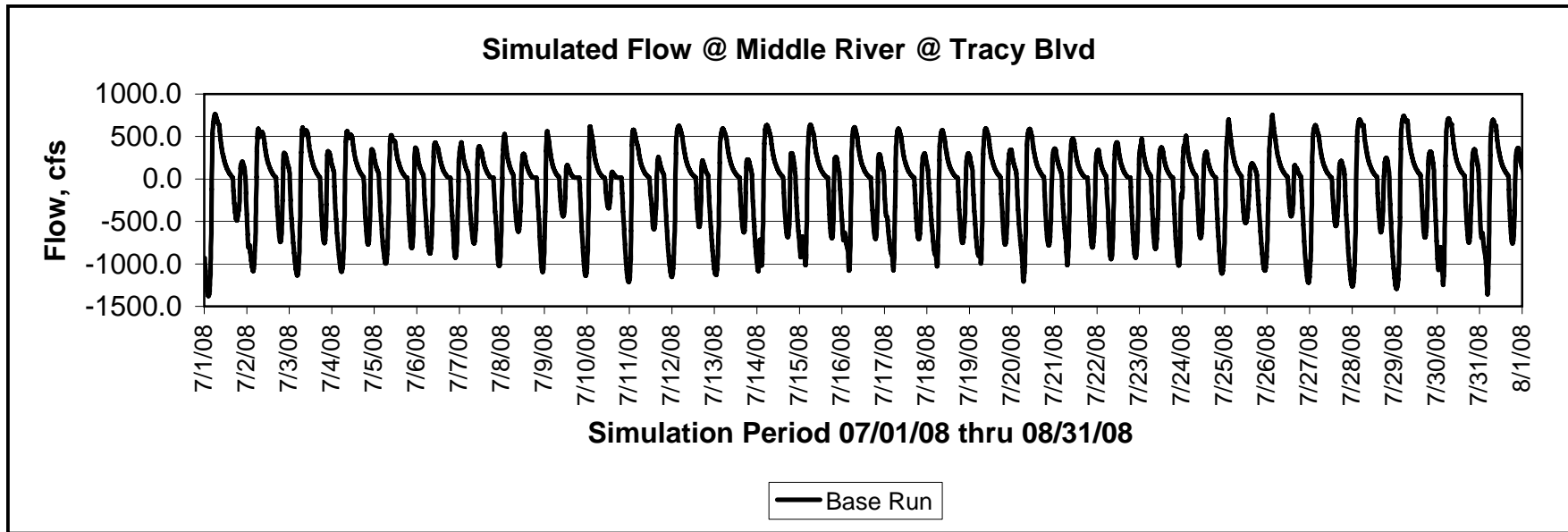


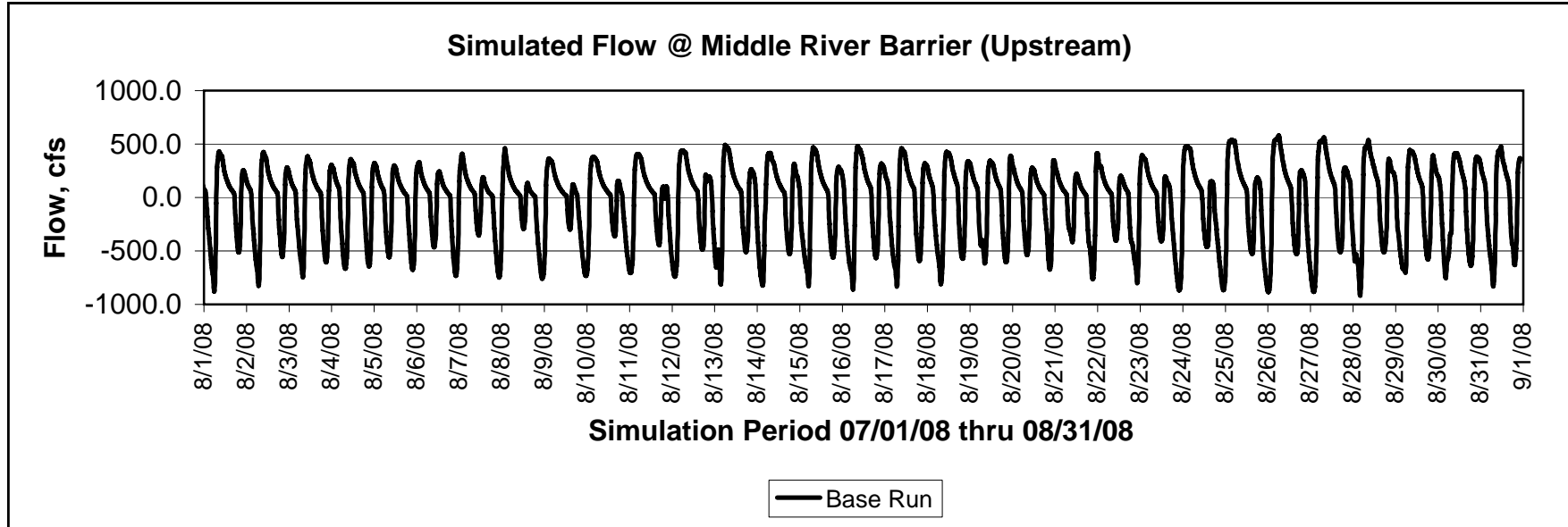
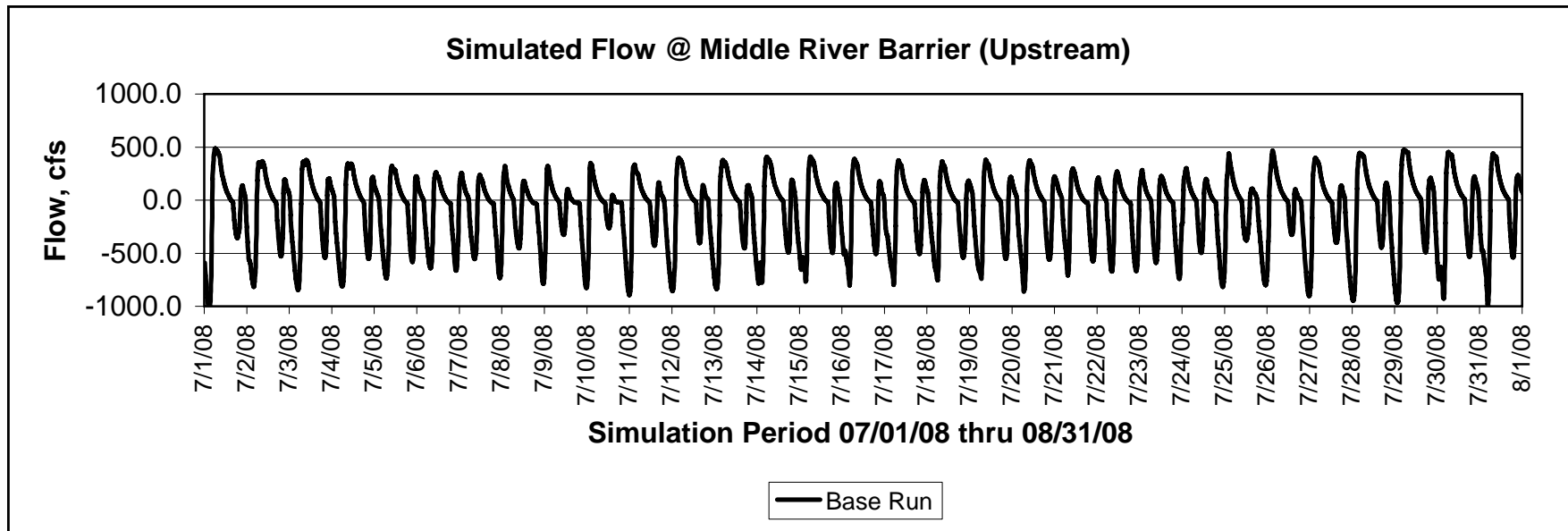


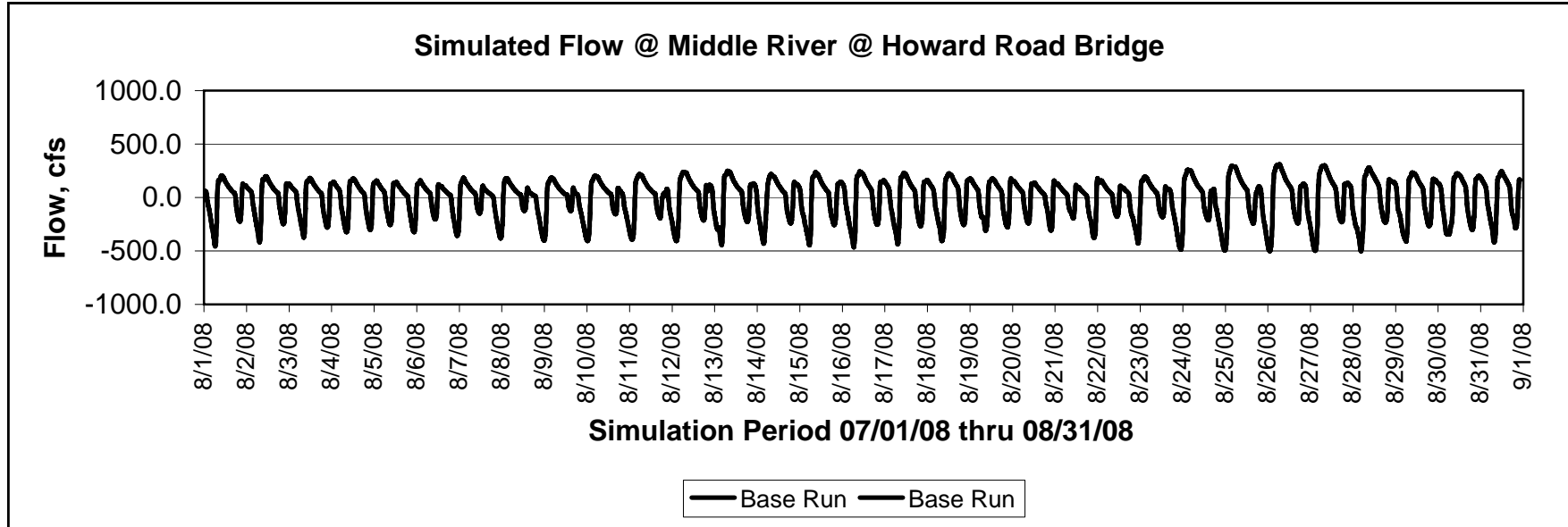
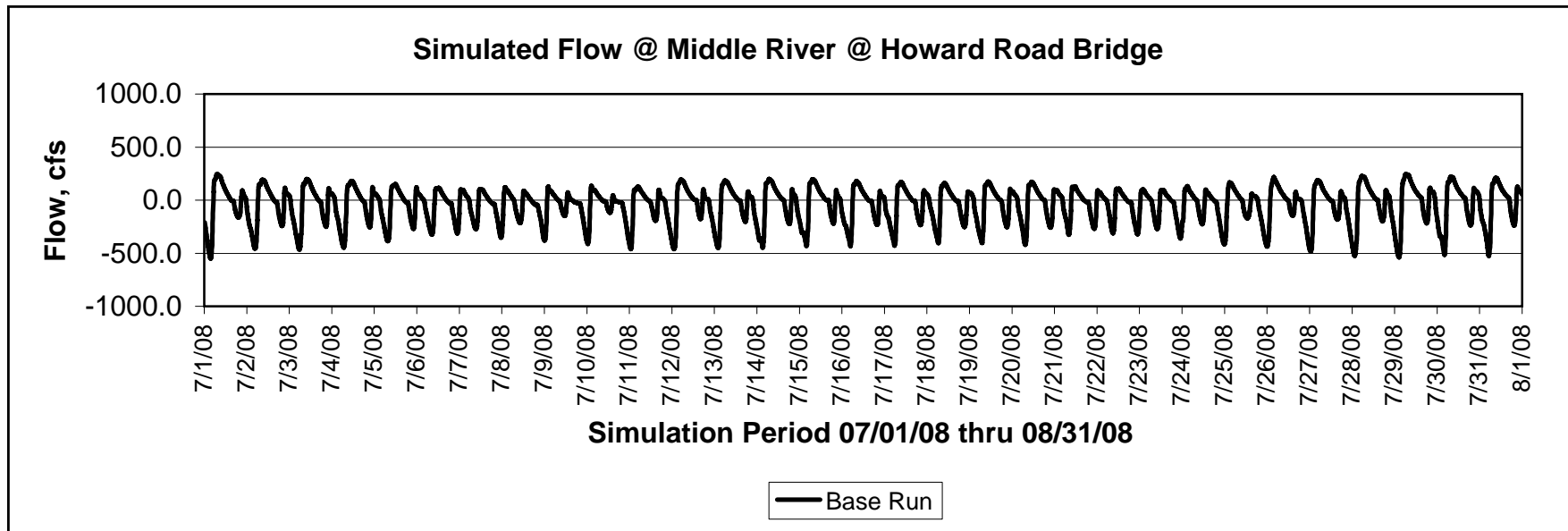


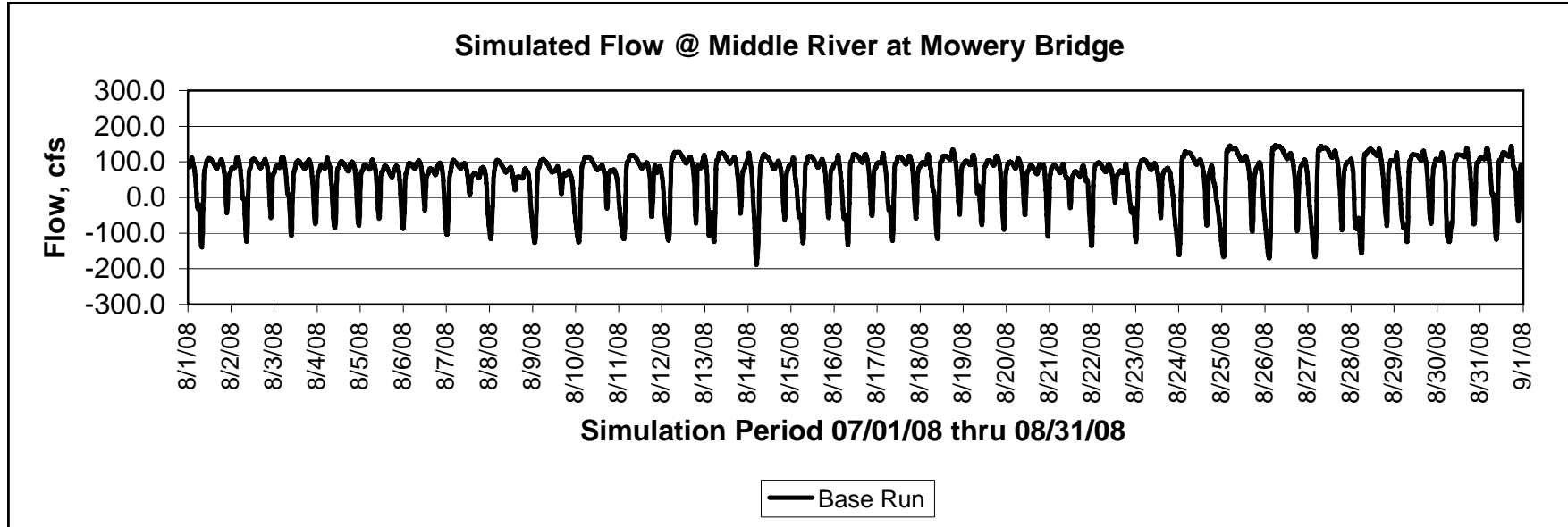
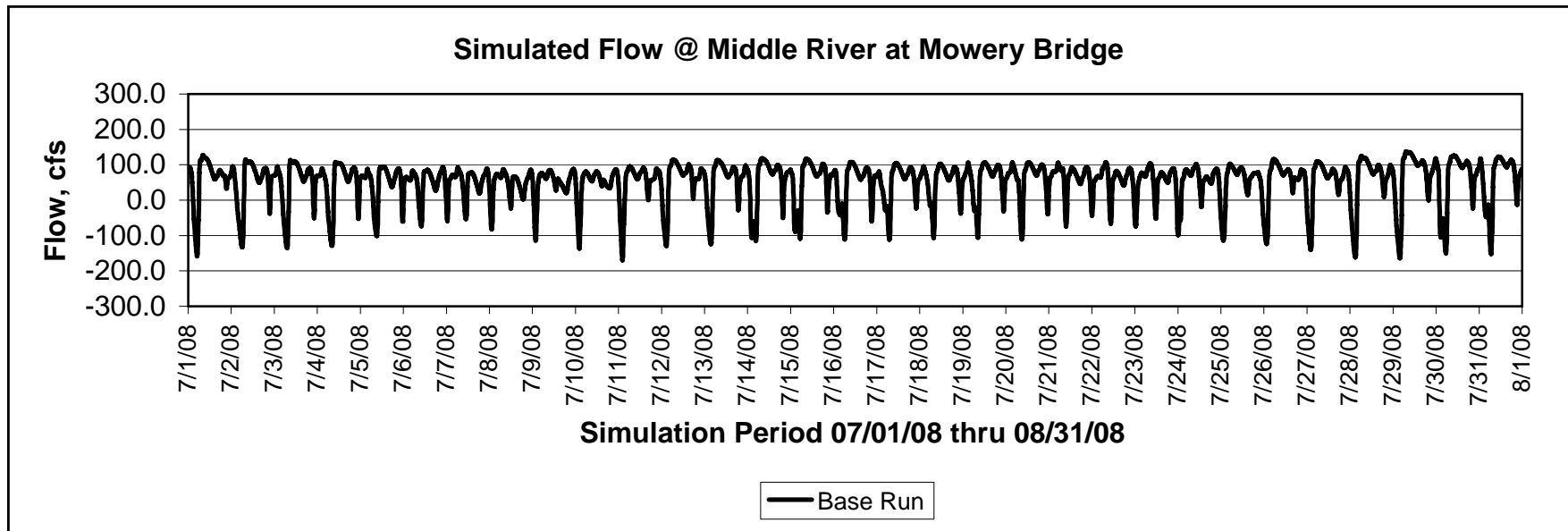


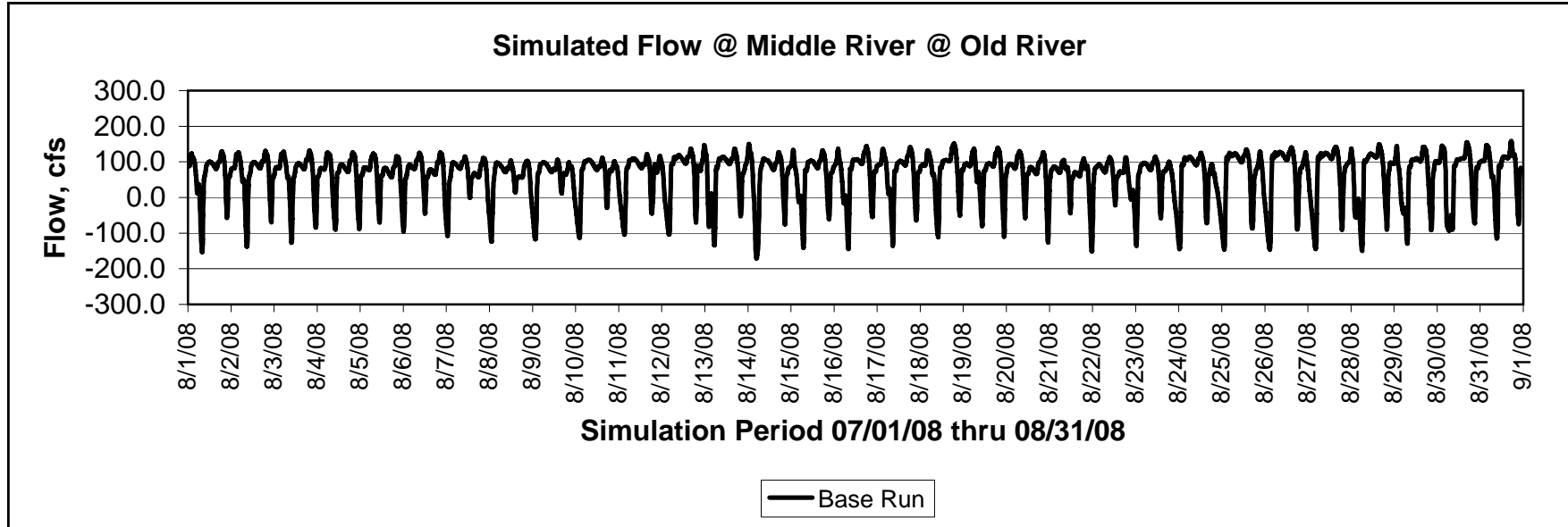
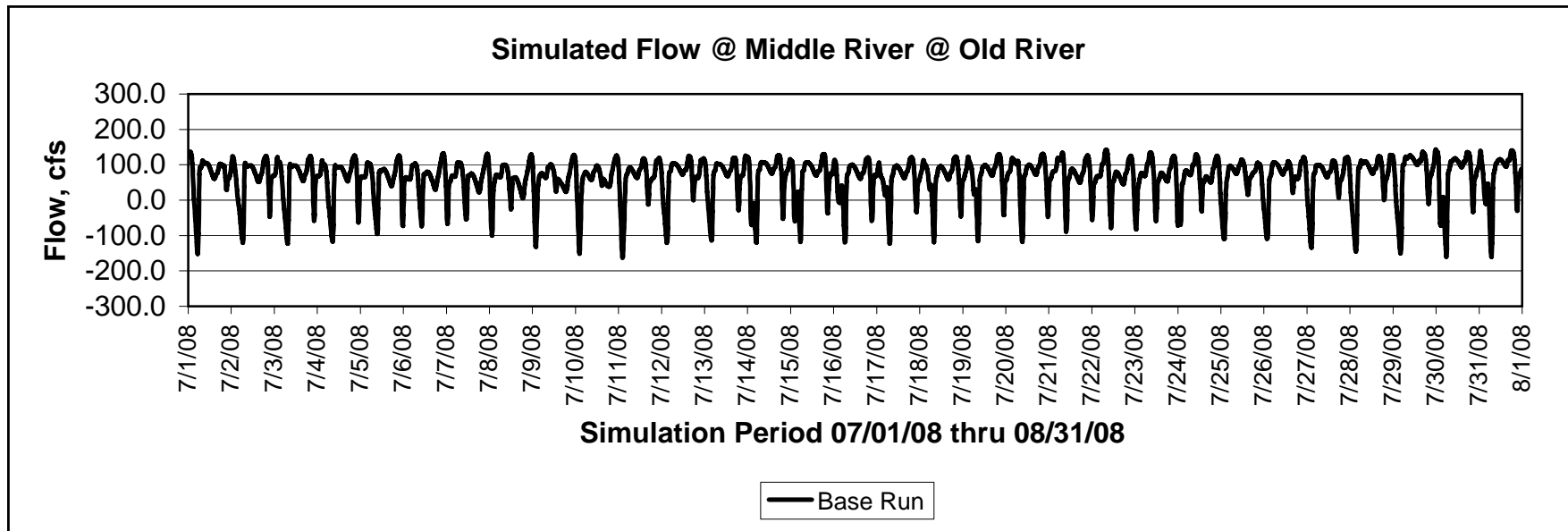




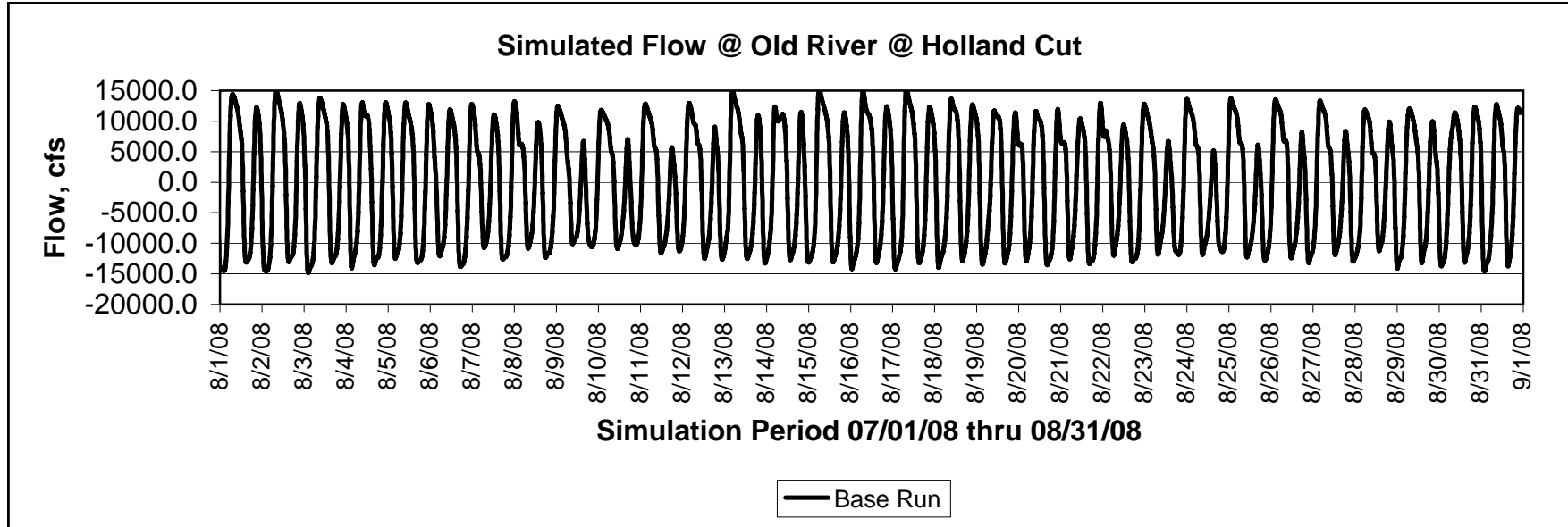
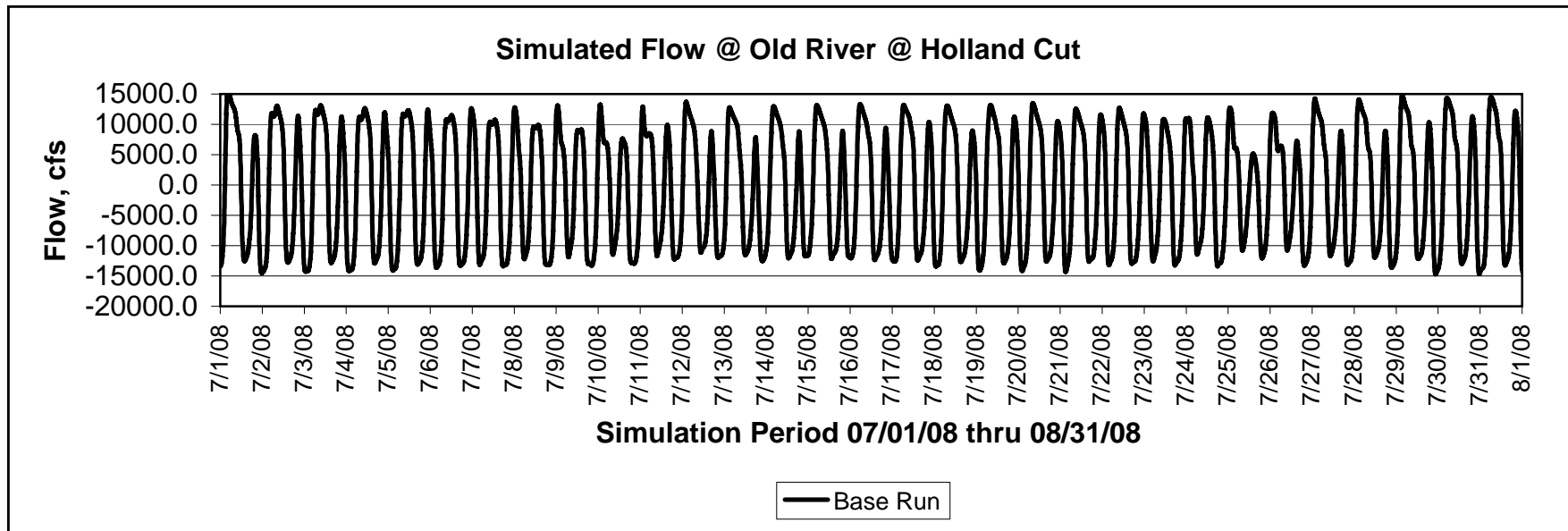


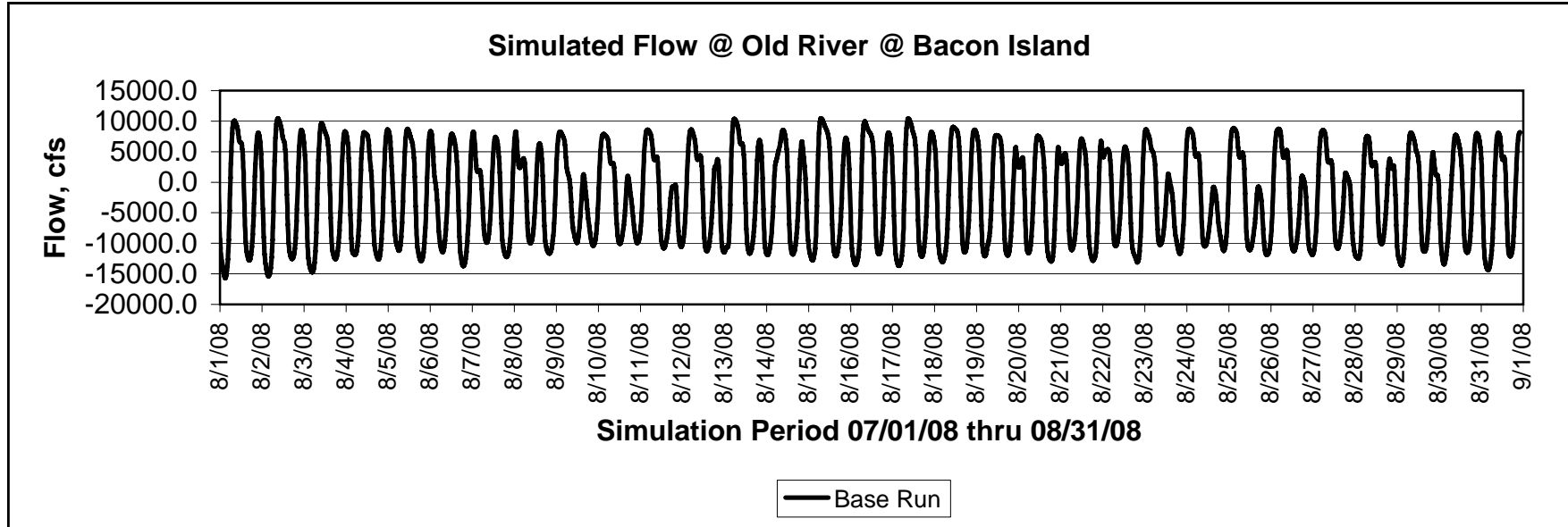
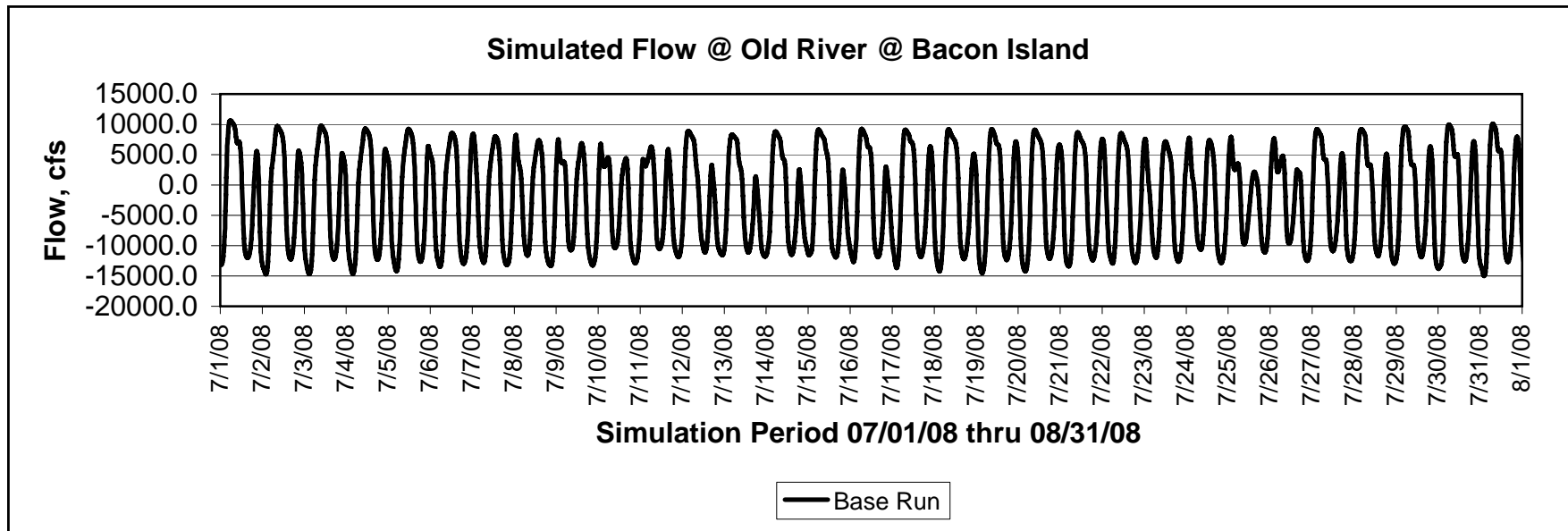


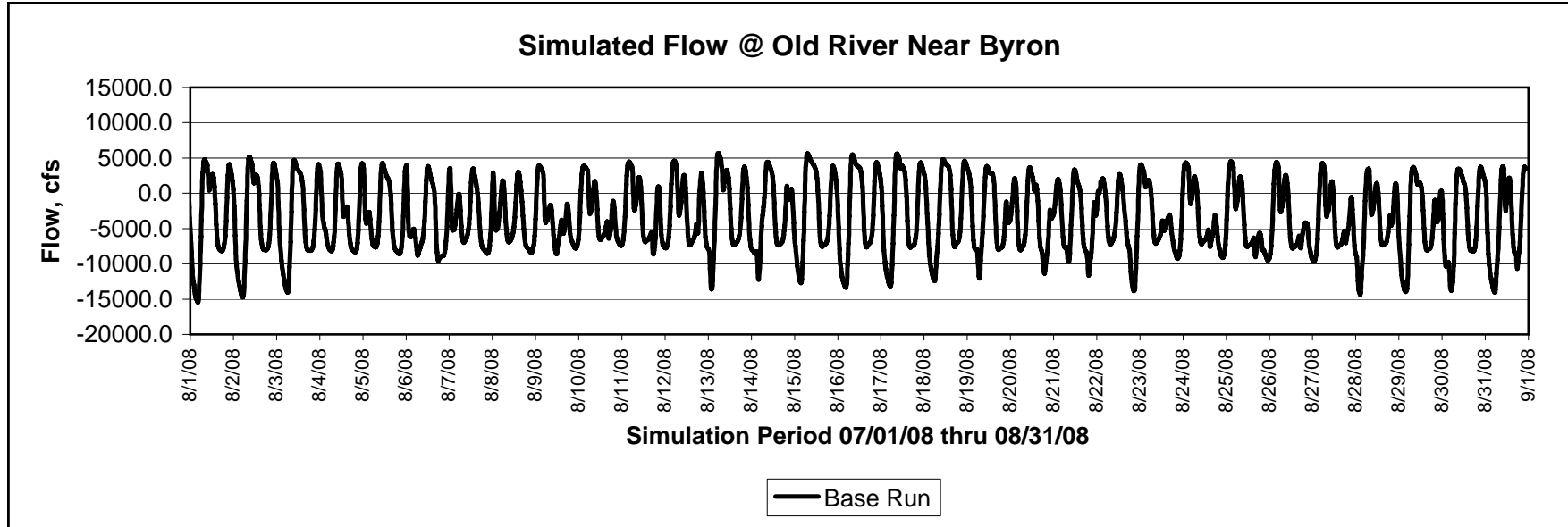
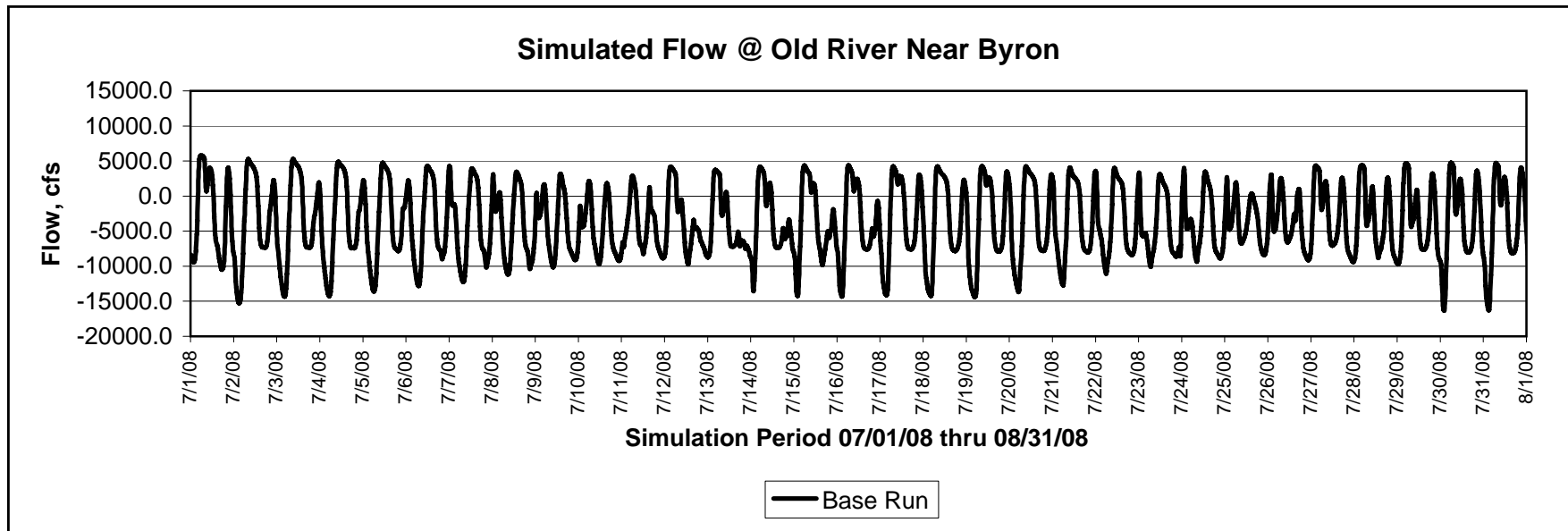


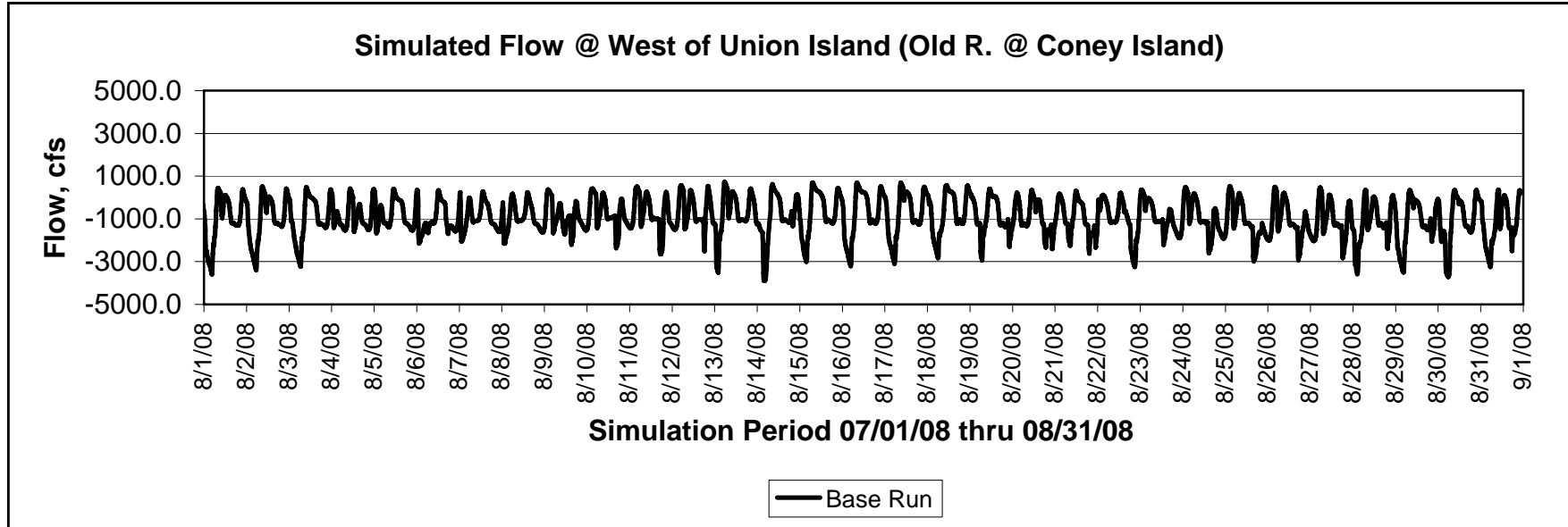
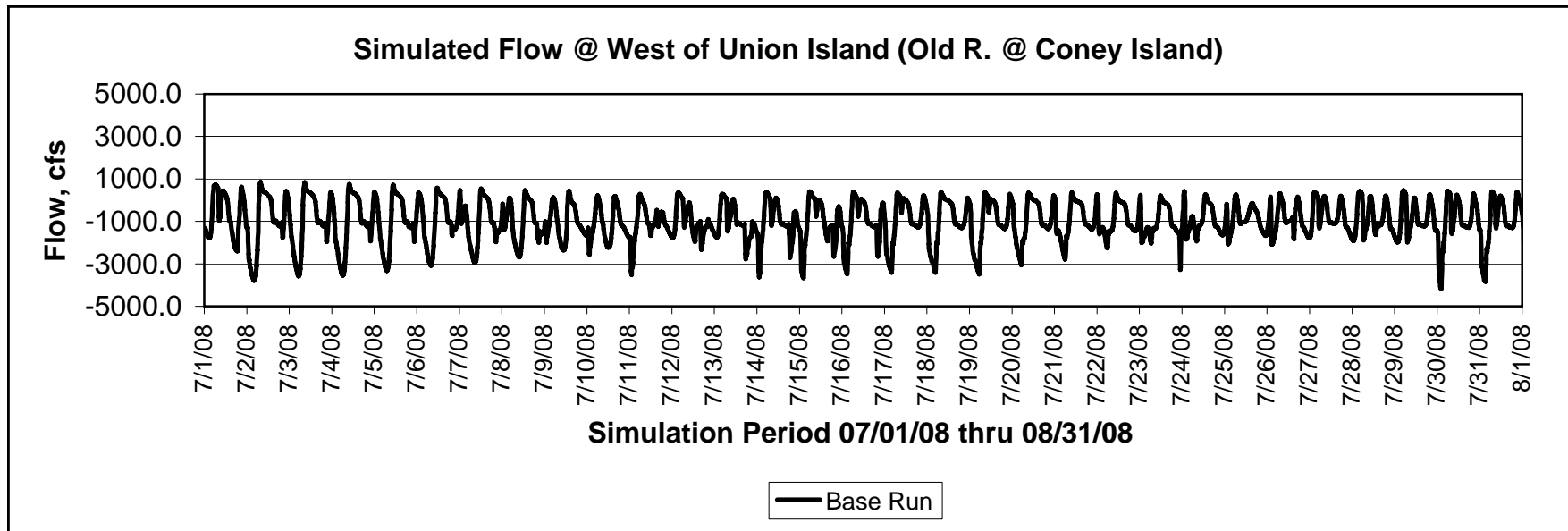


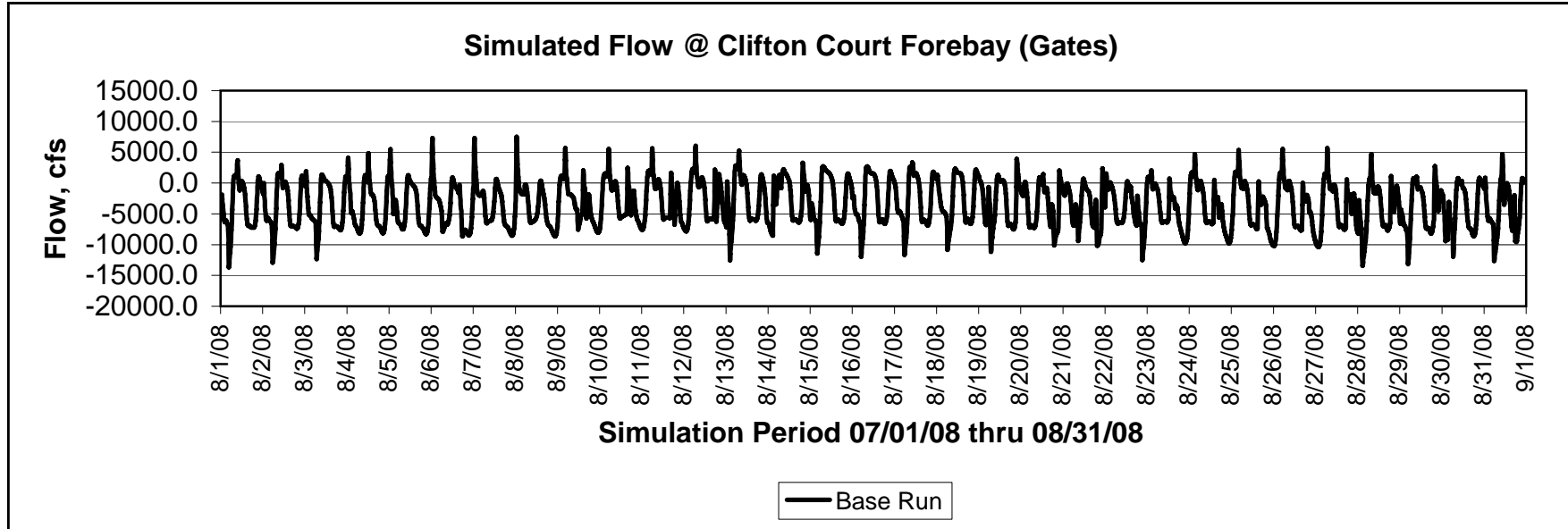
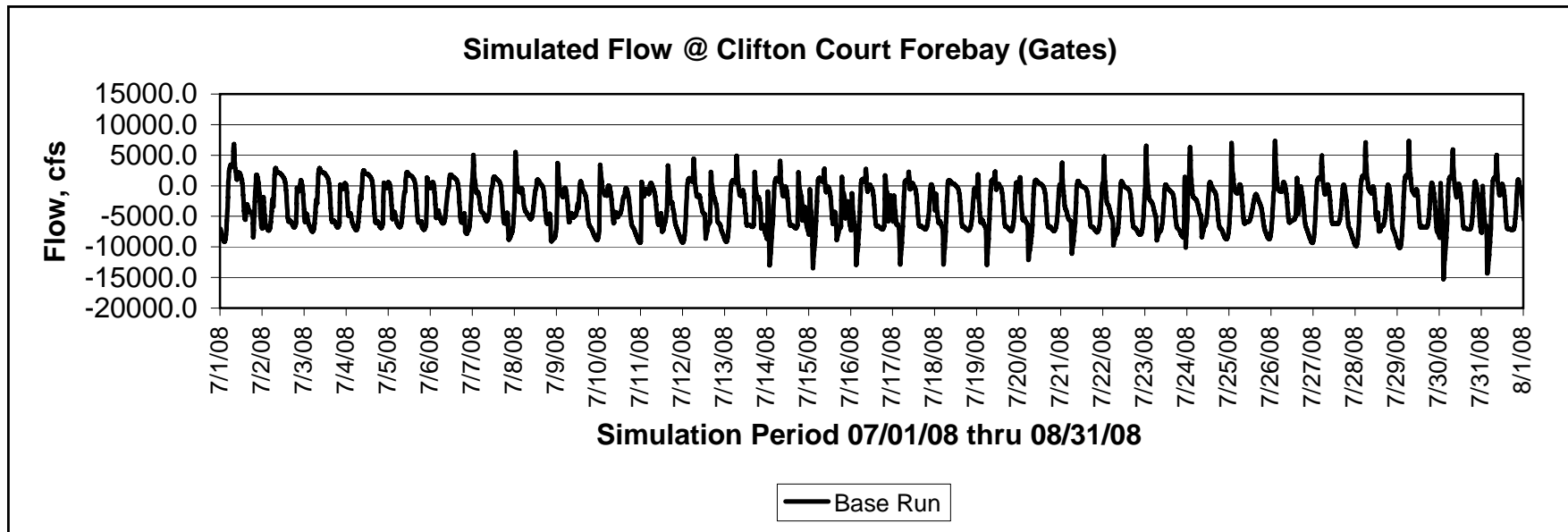
OLD RIVER - FLOW

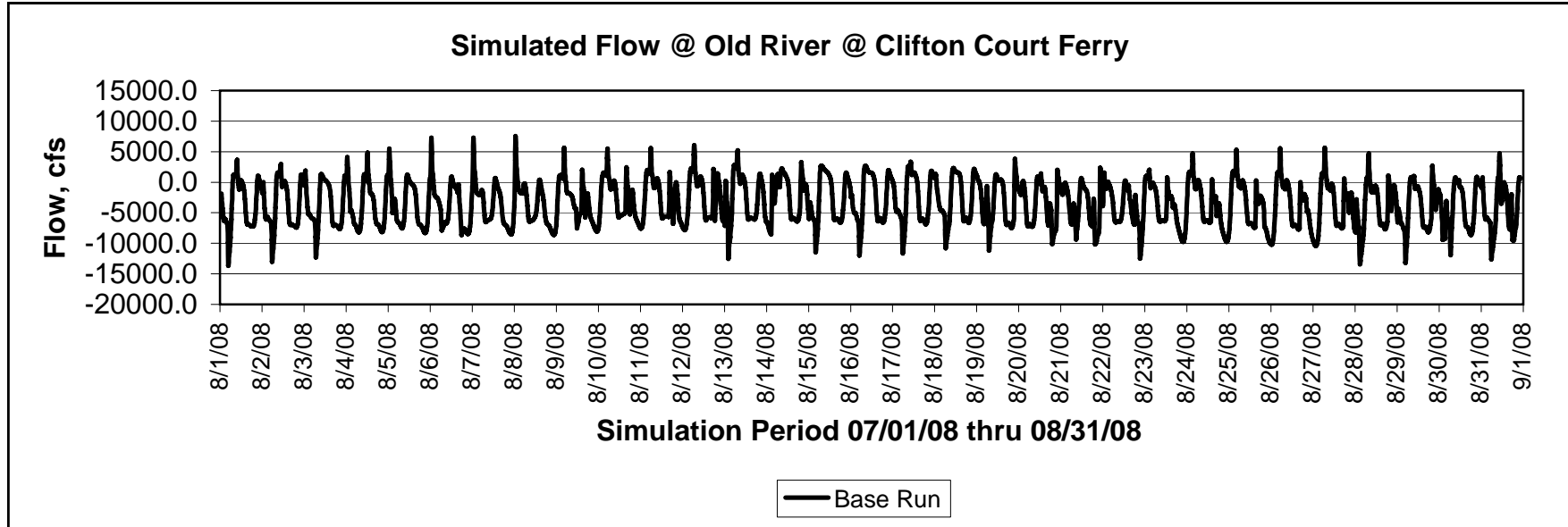
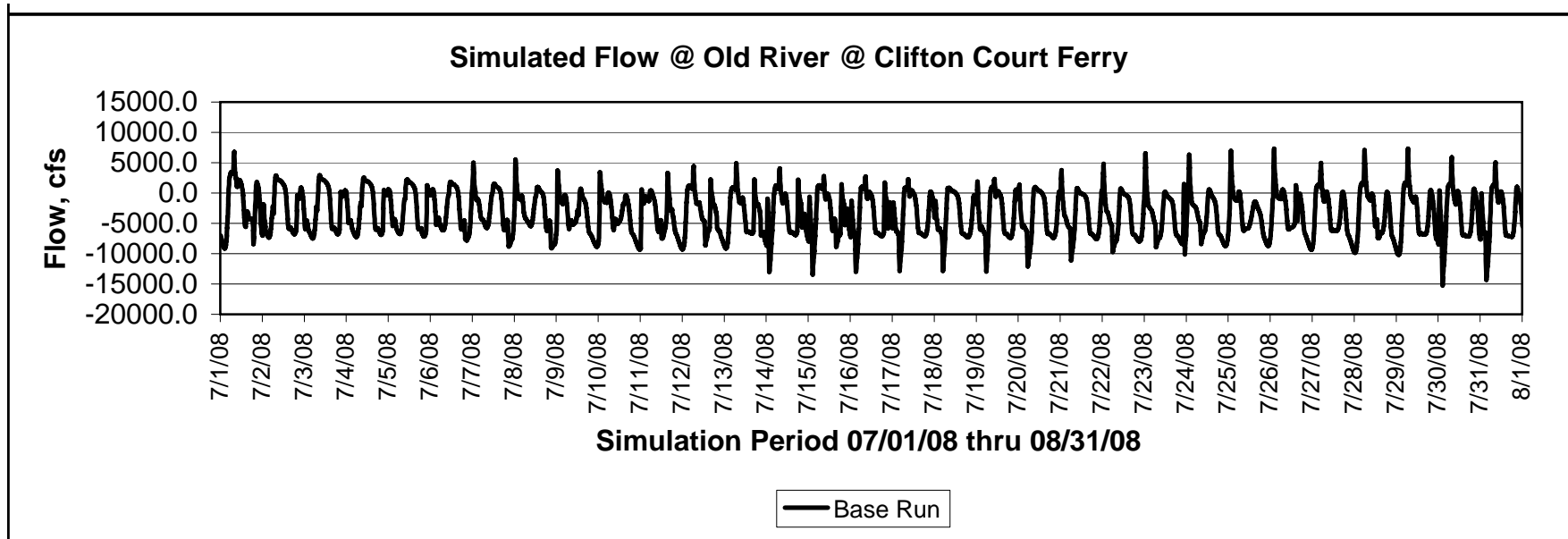


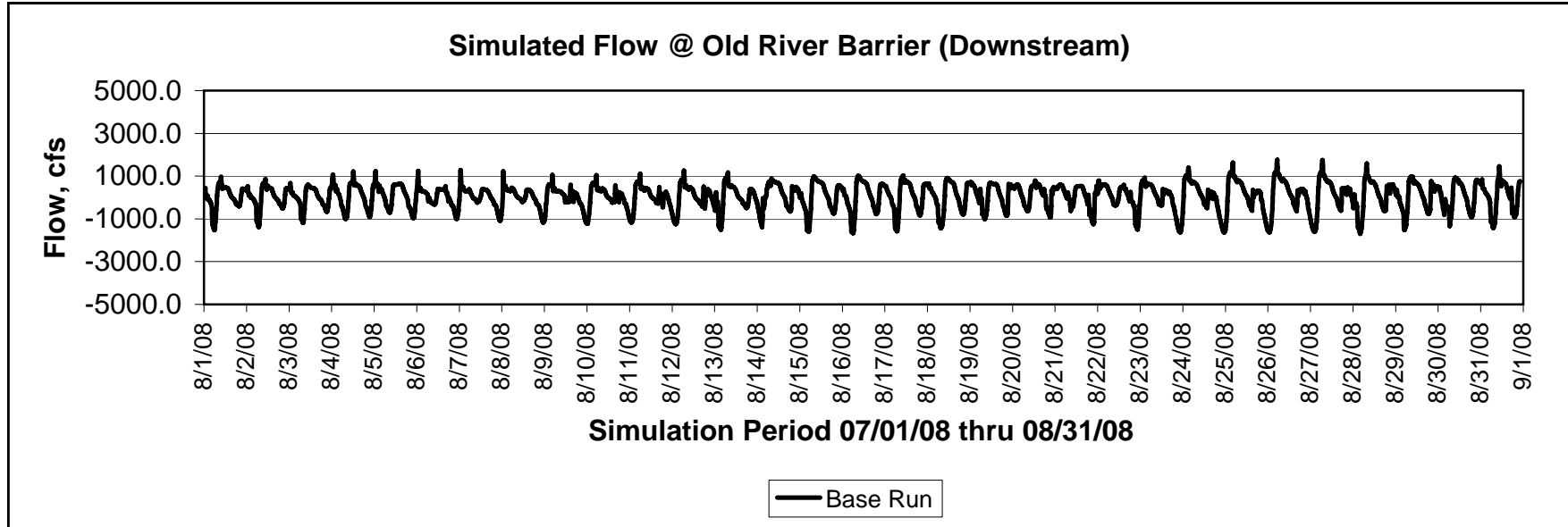
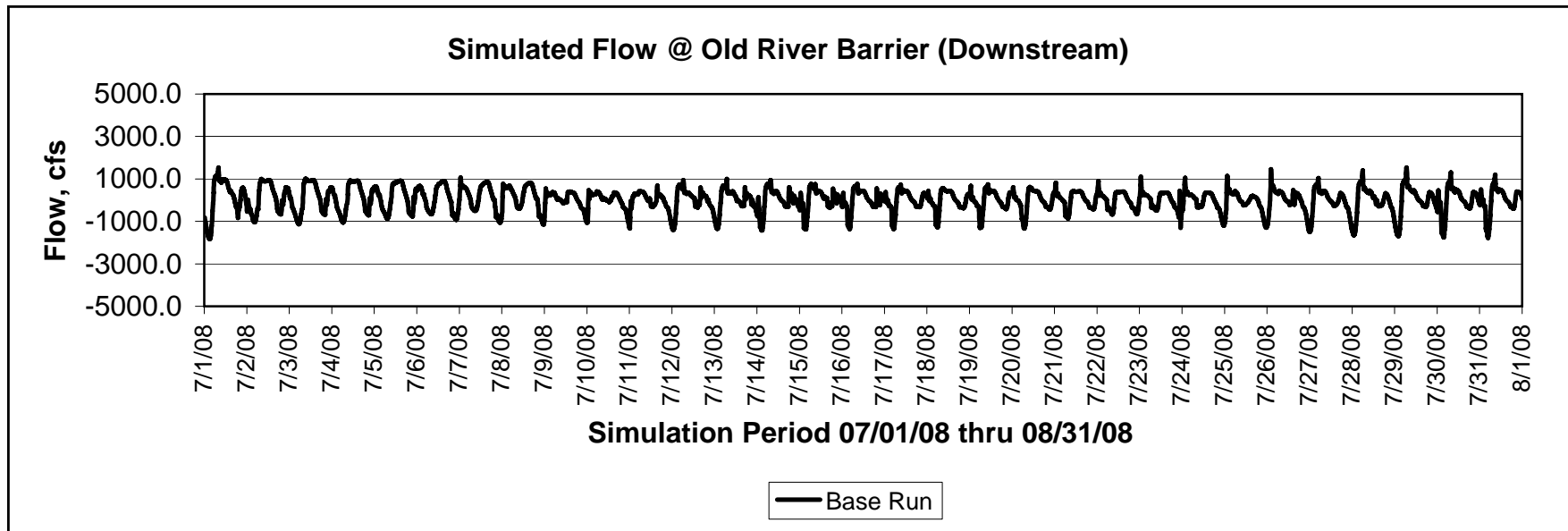


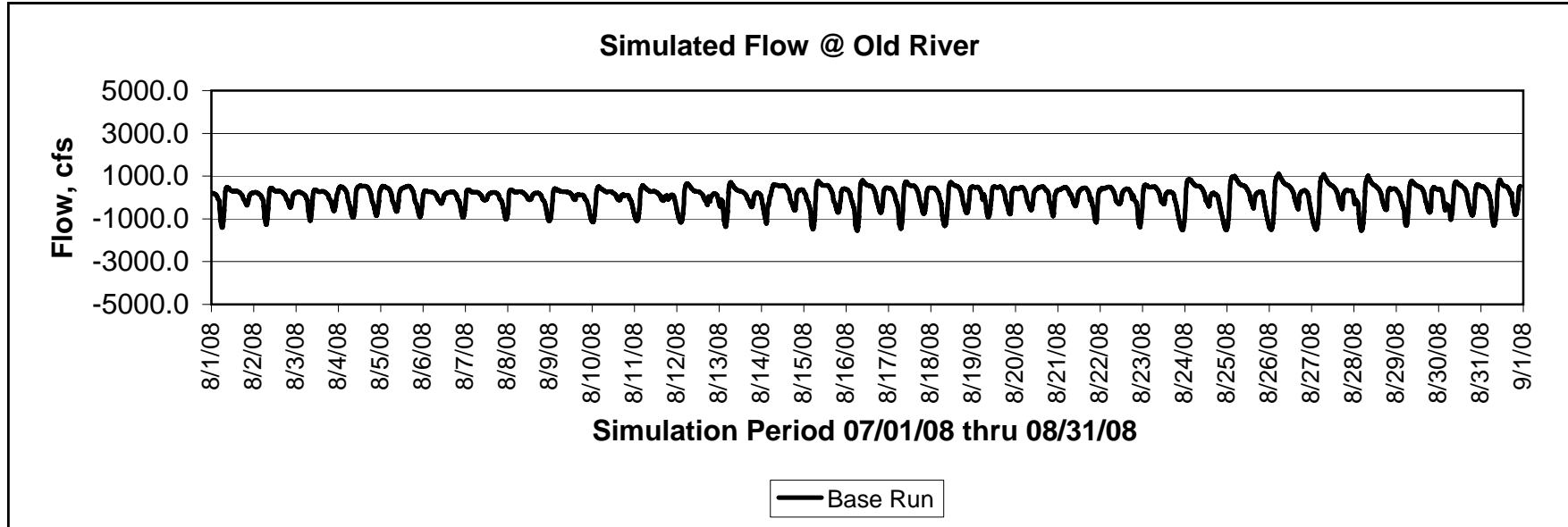
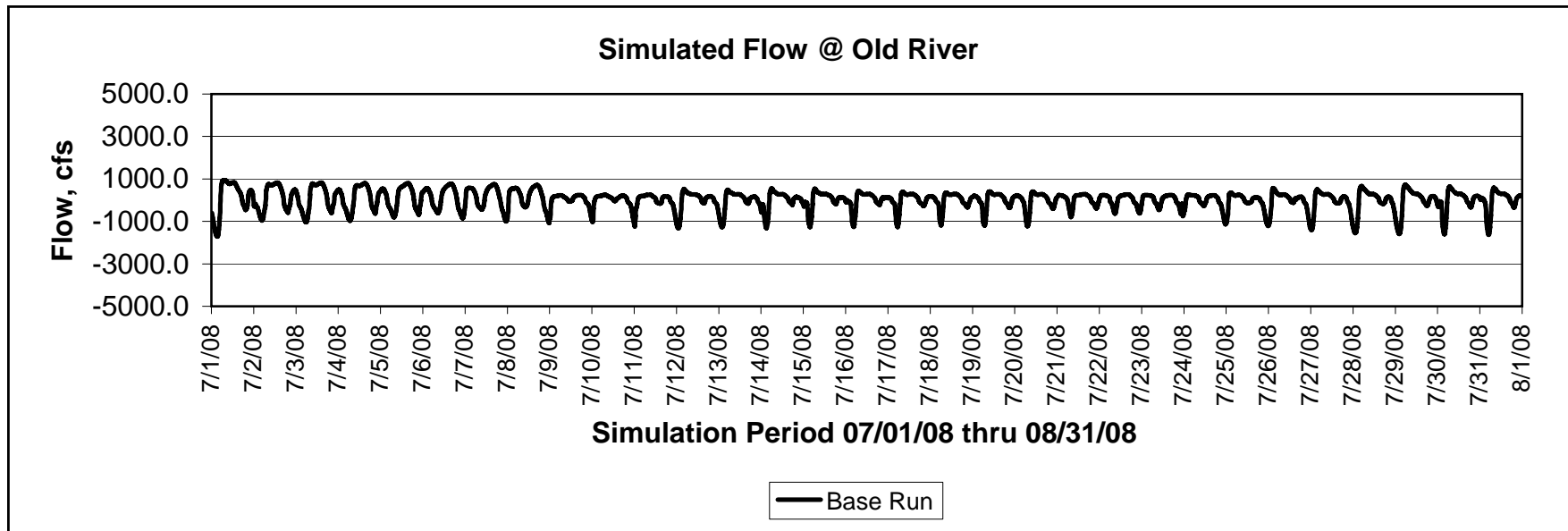


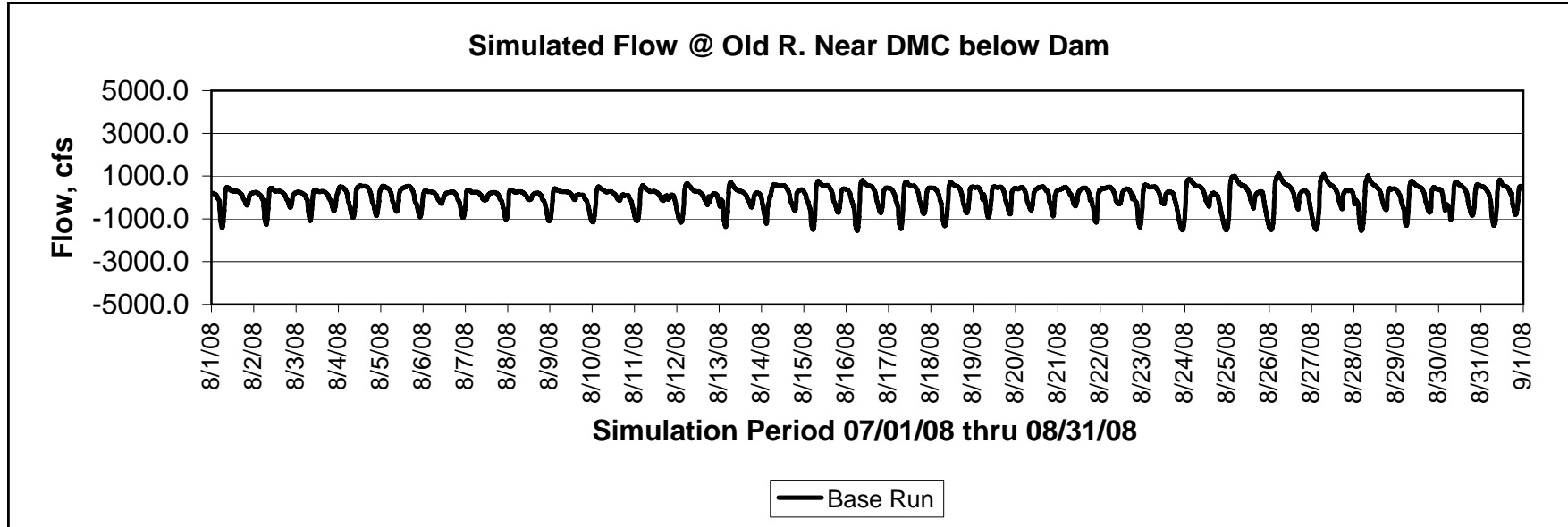
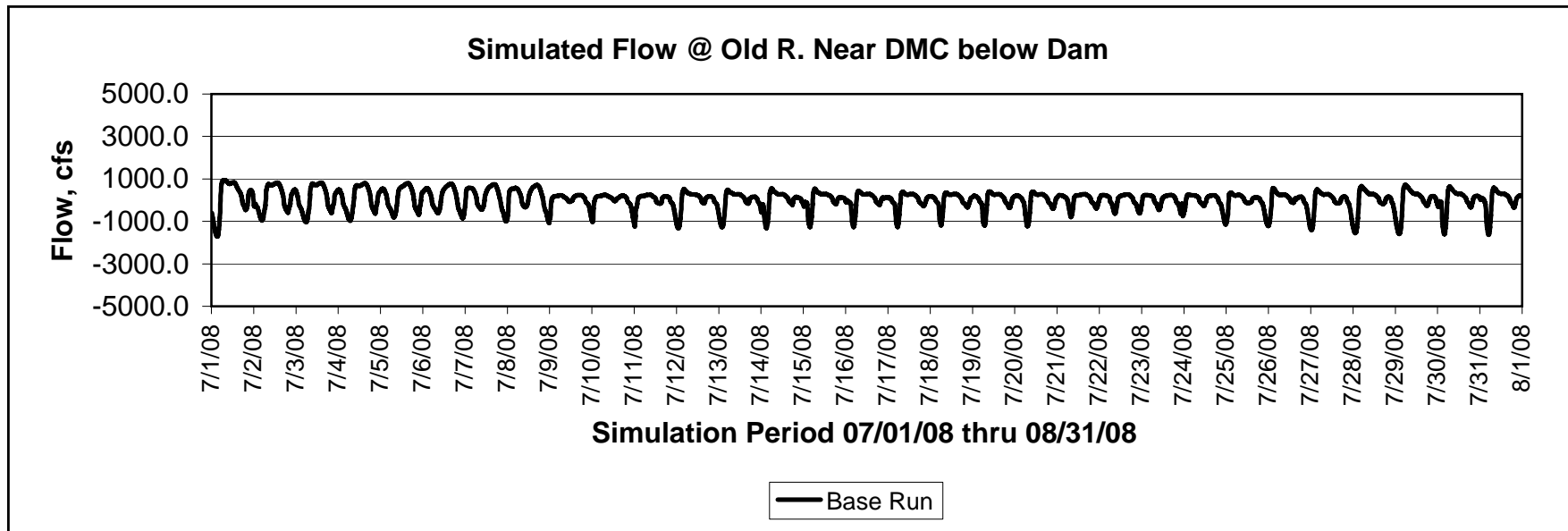


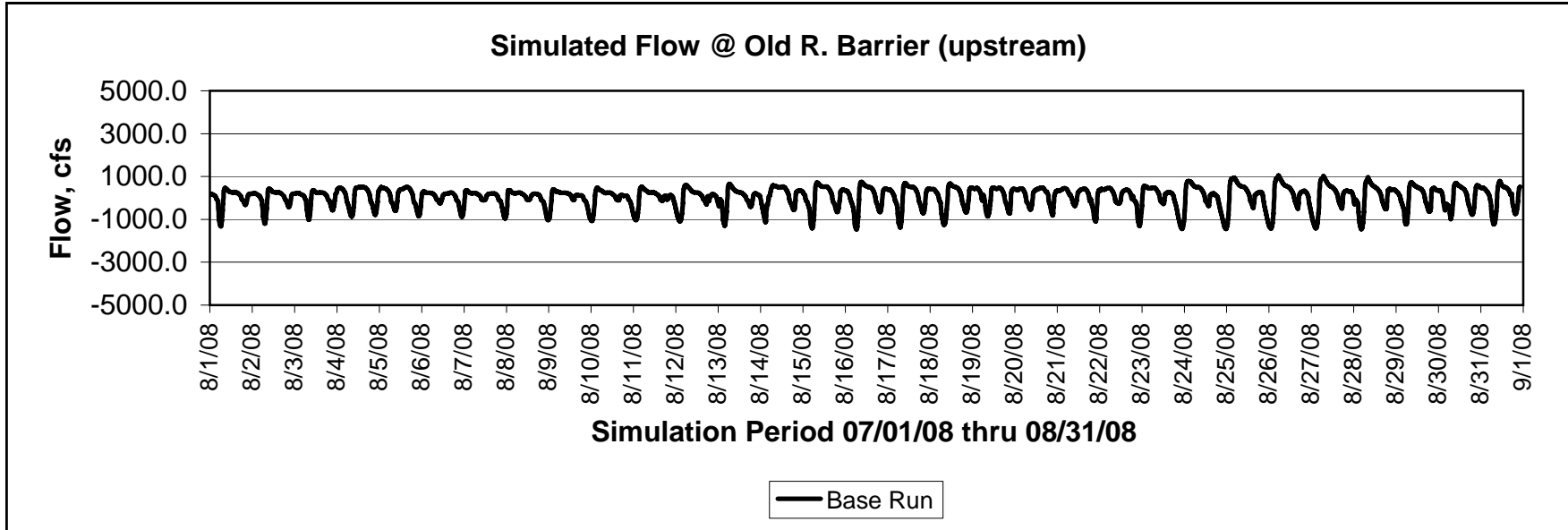
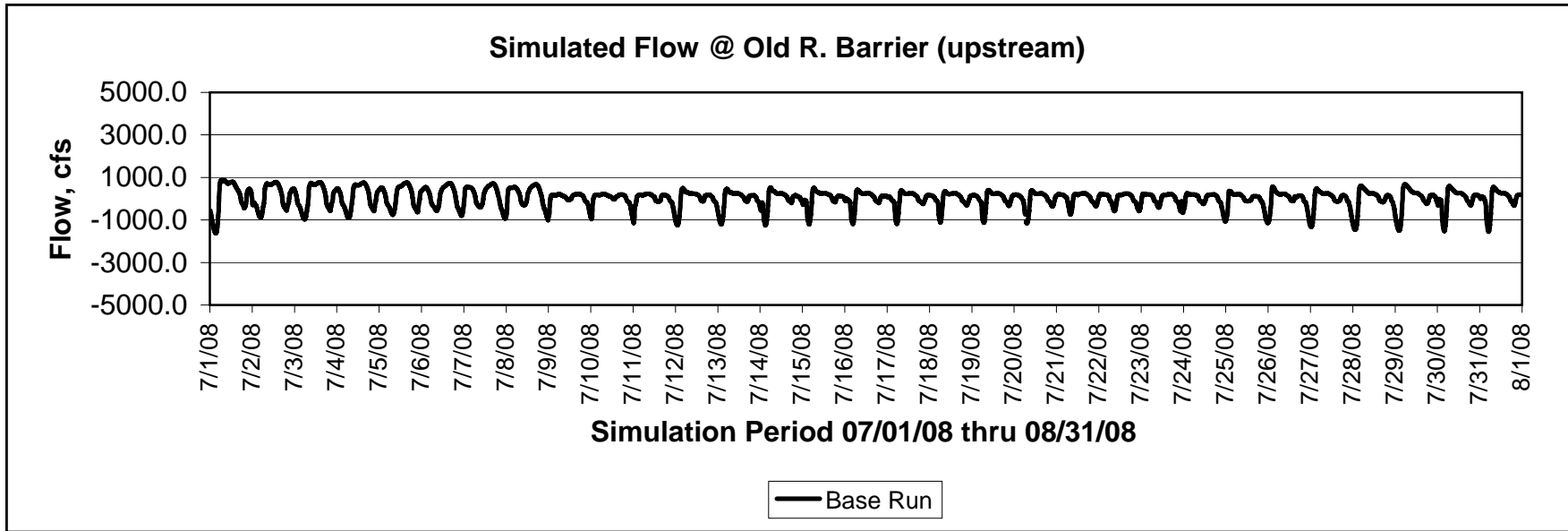


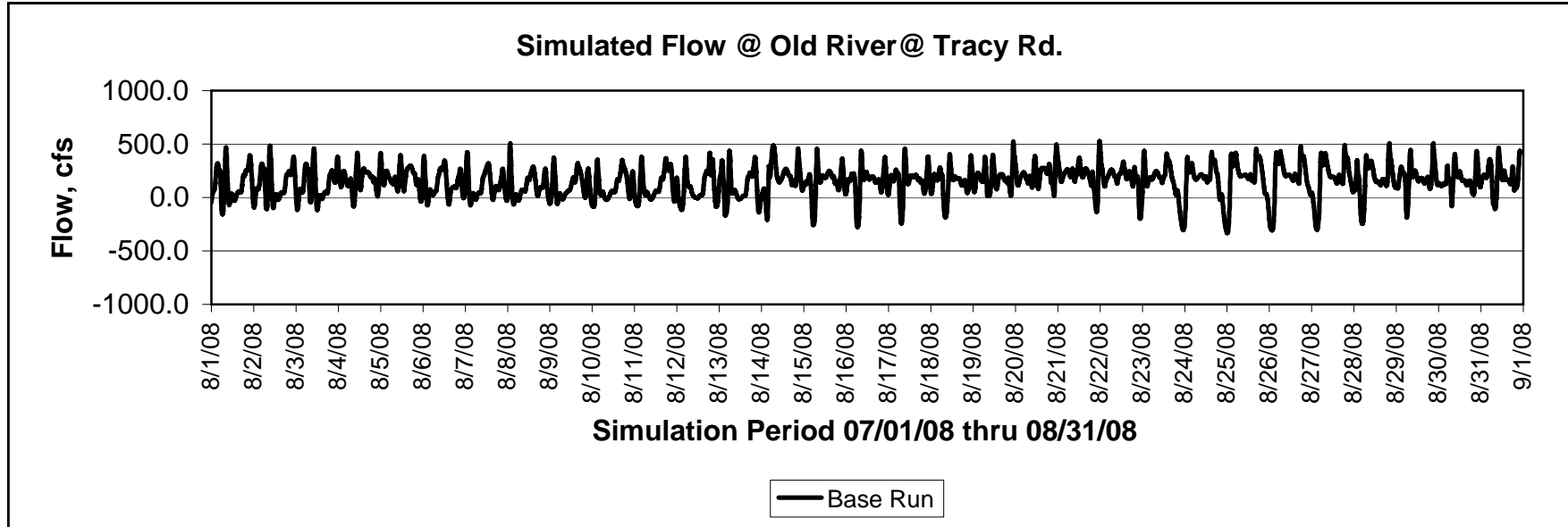
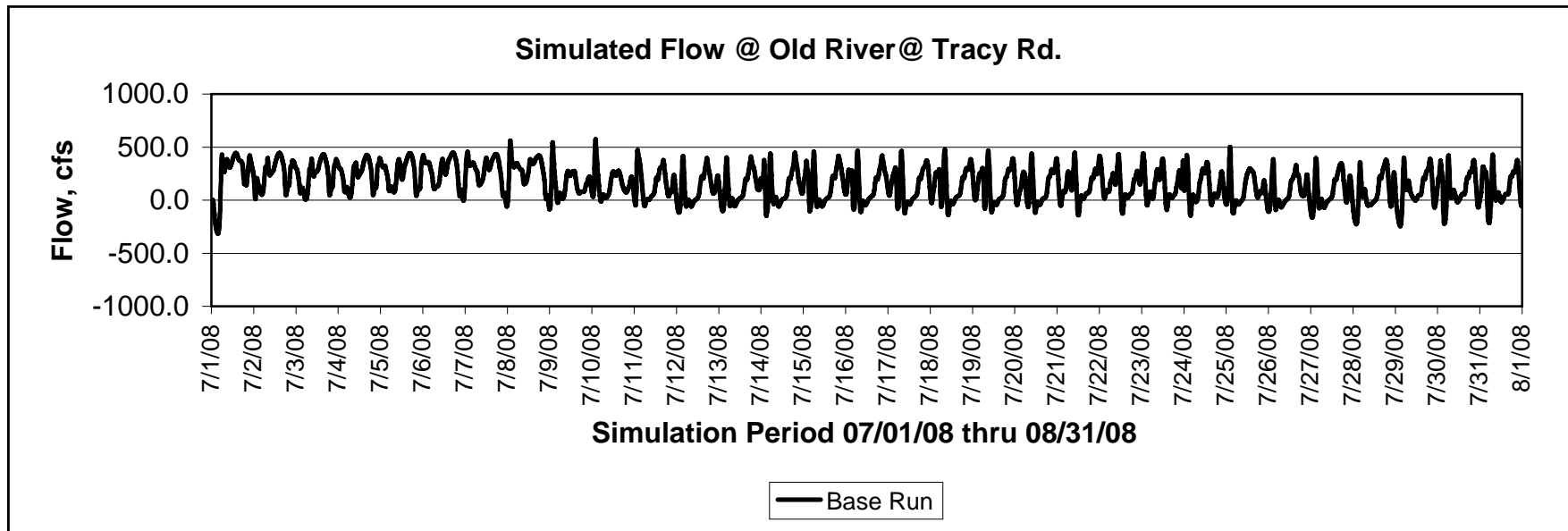


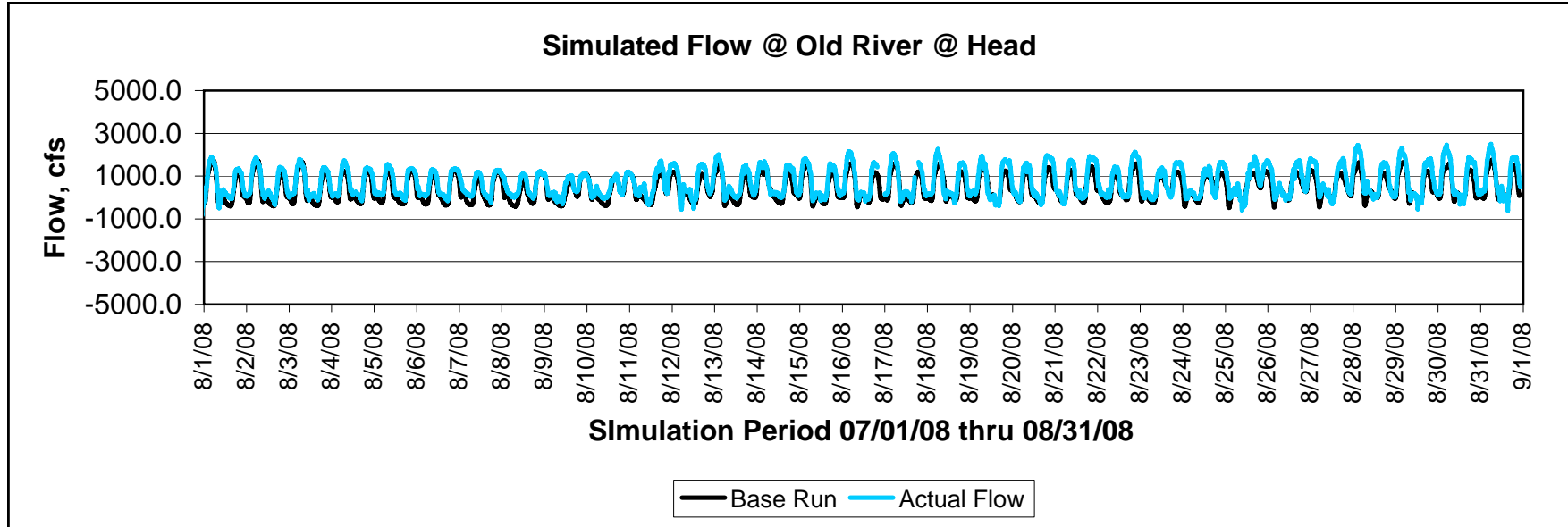
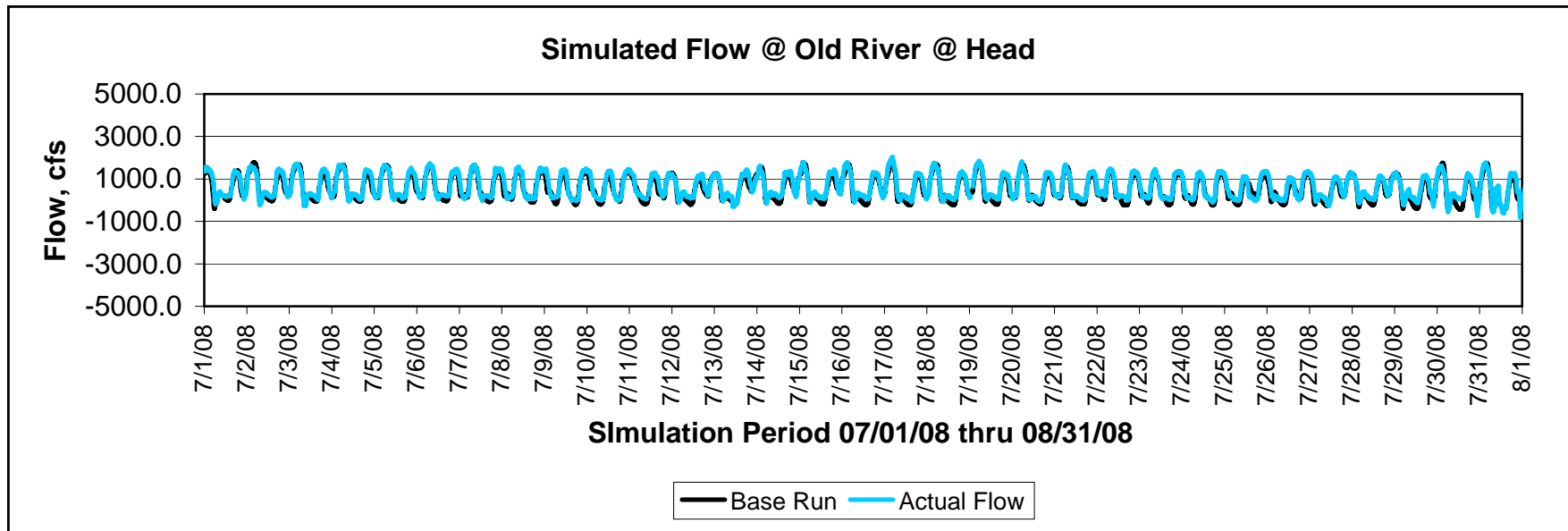




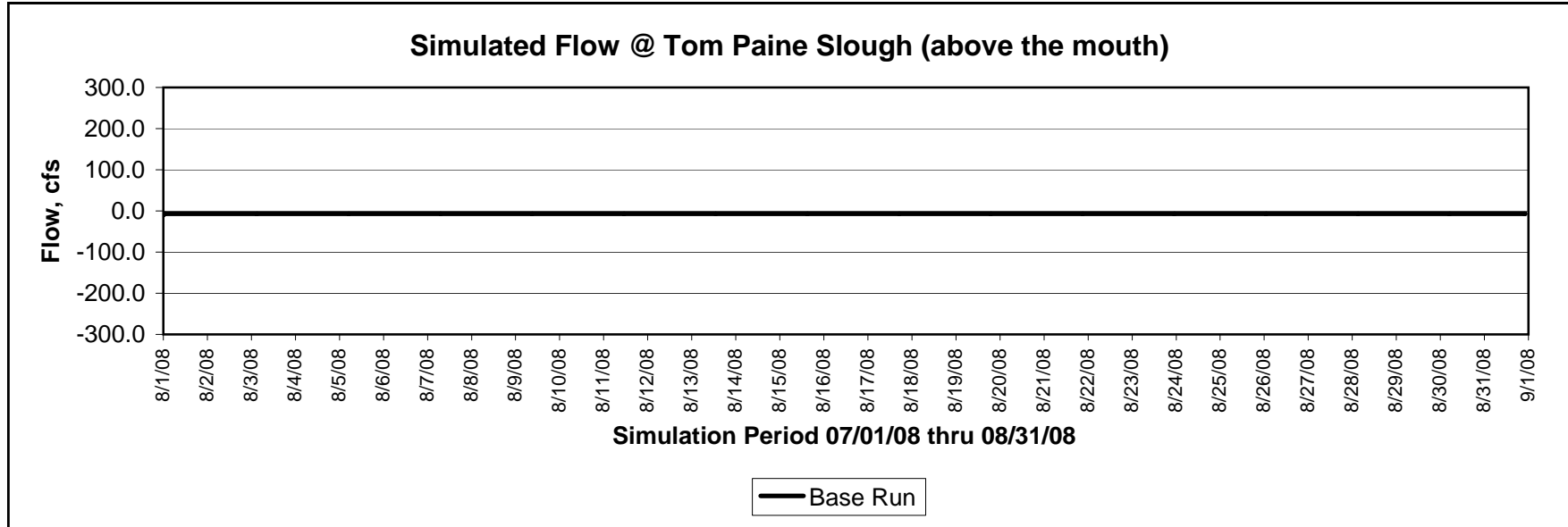
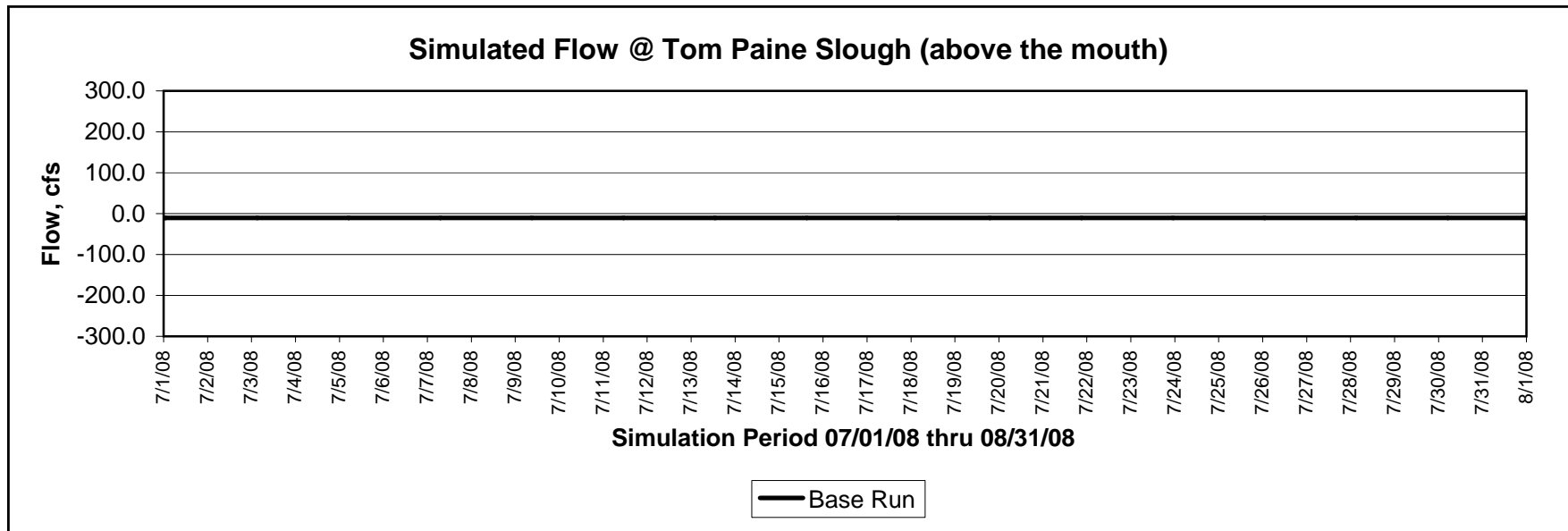


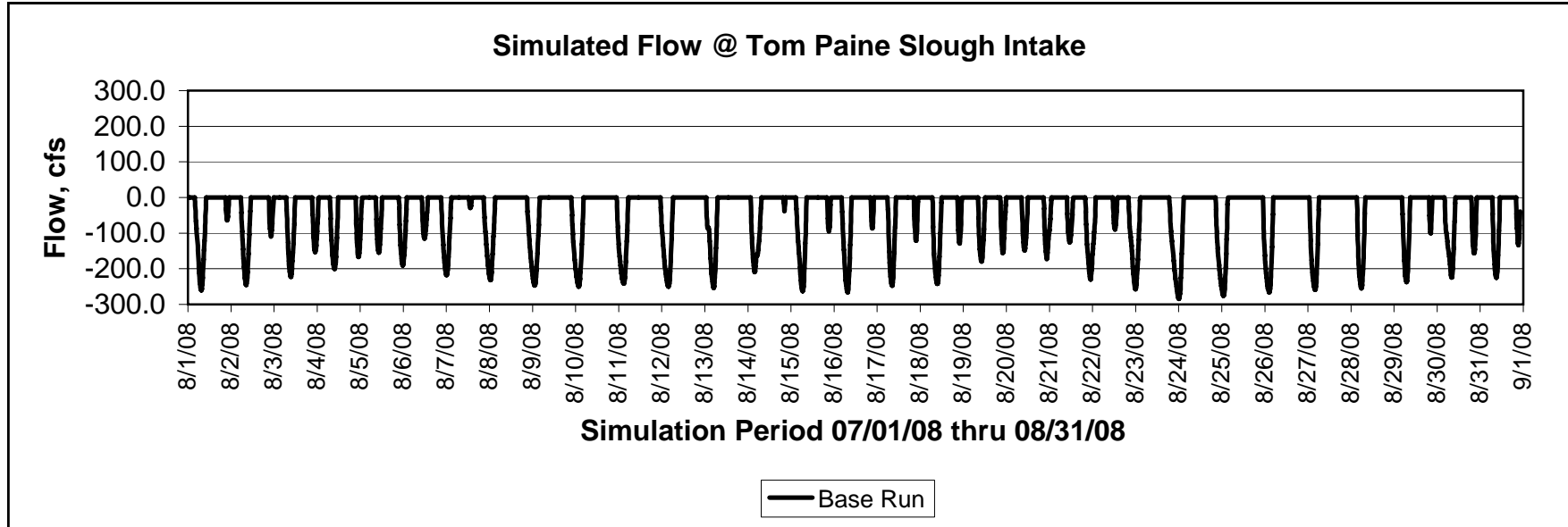
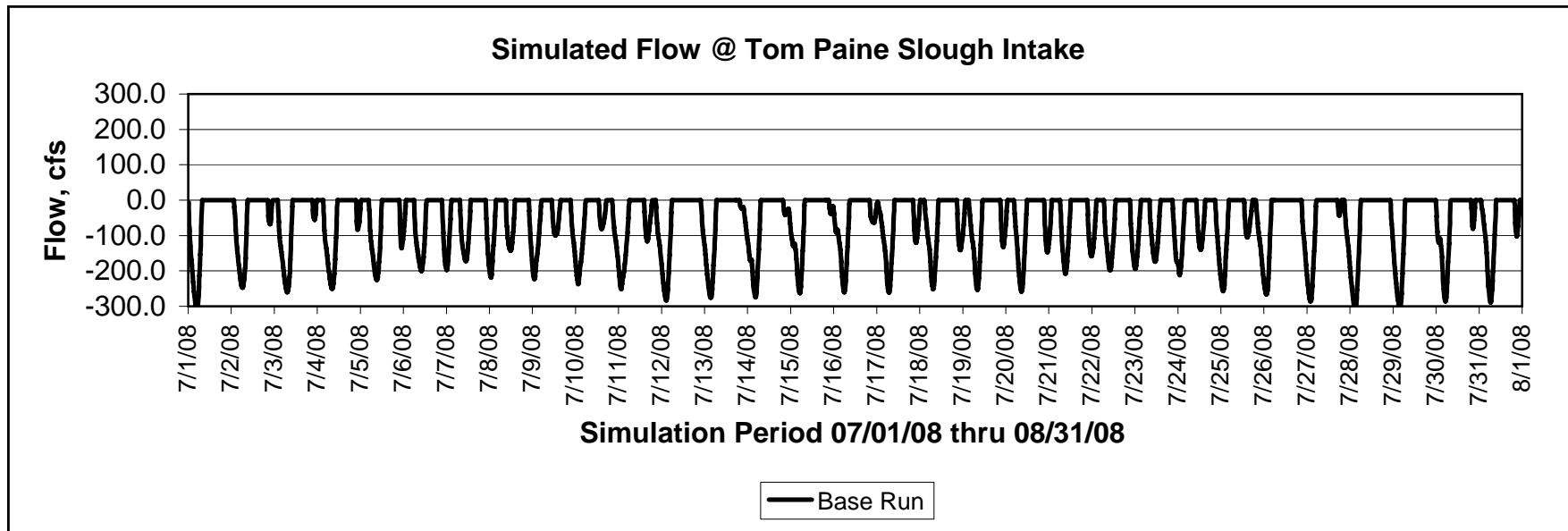




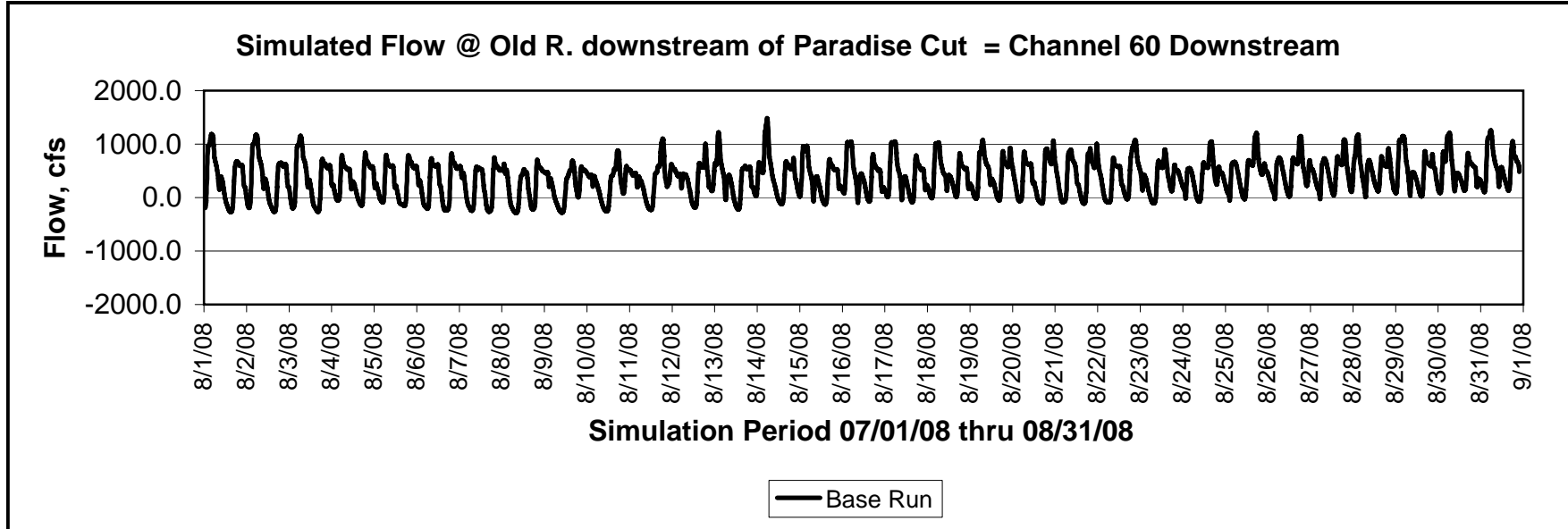
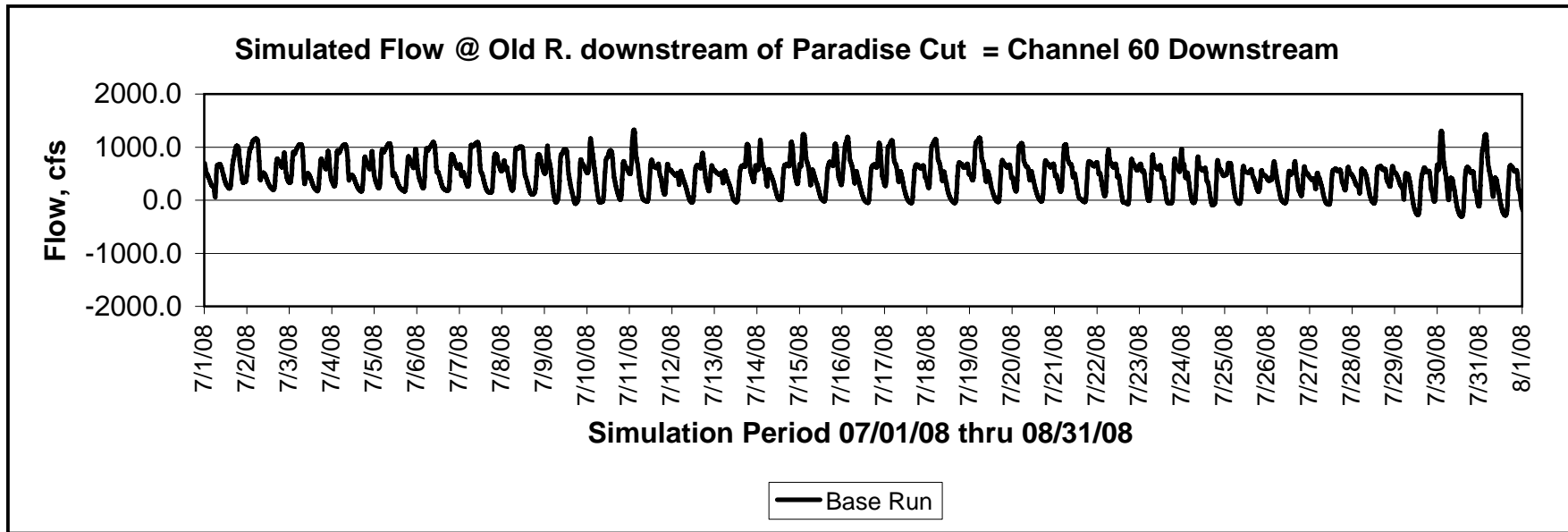


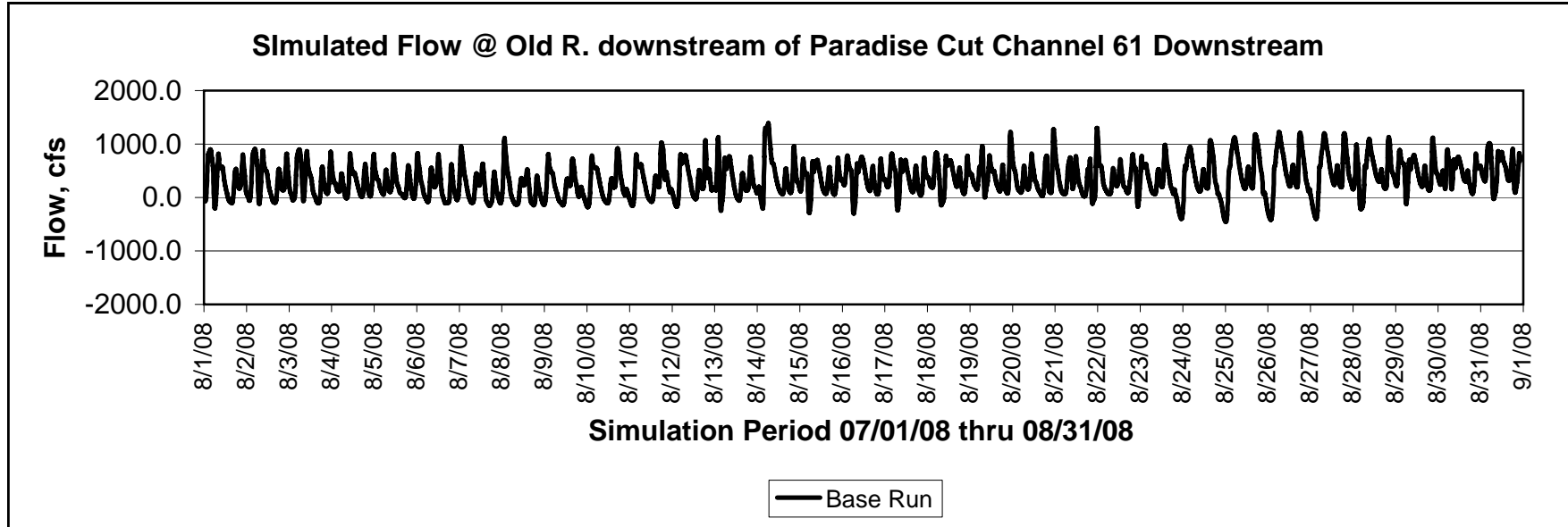
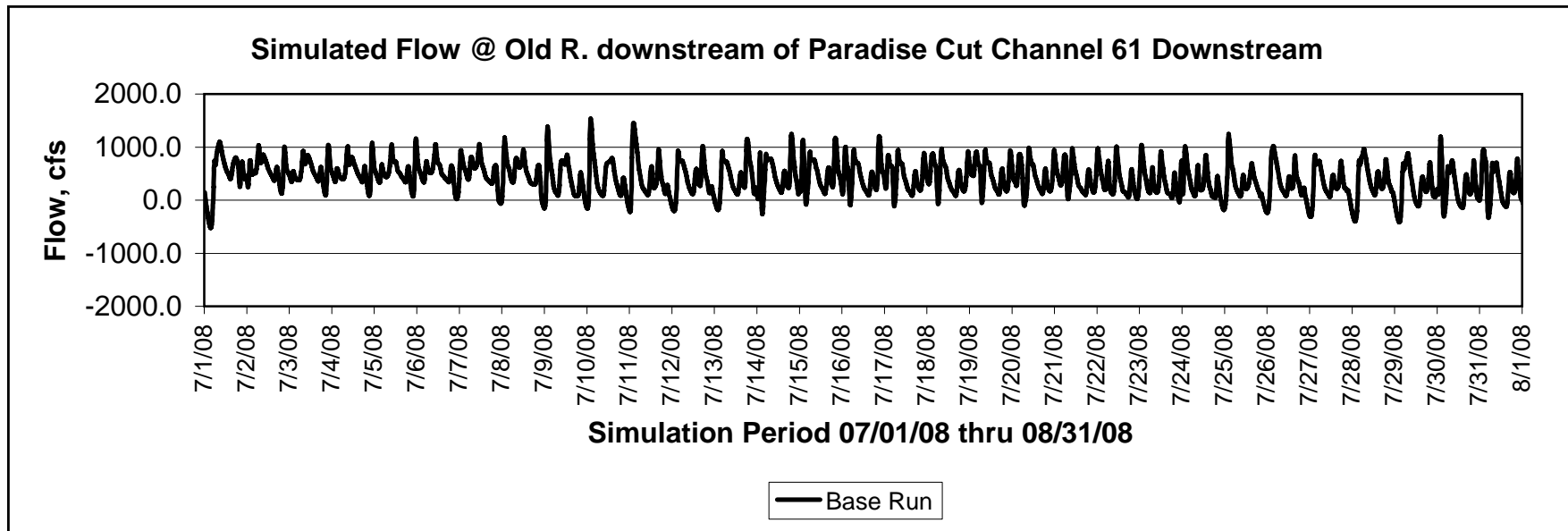
TOM PAINE SLOUGH - FLOW

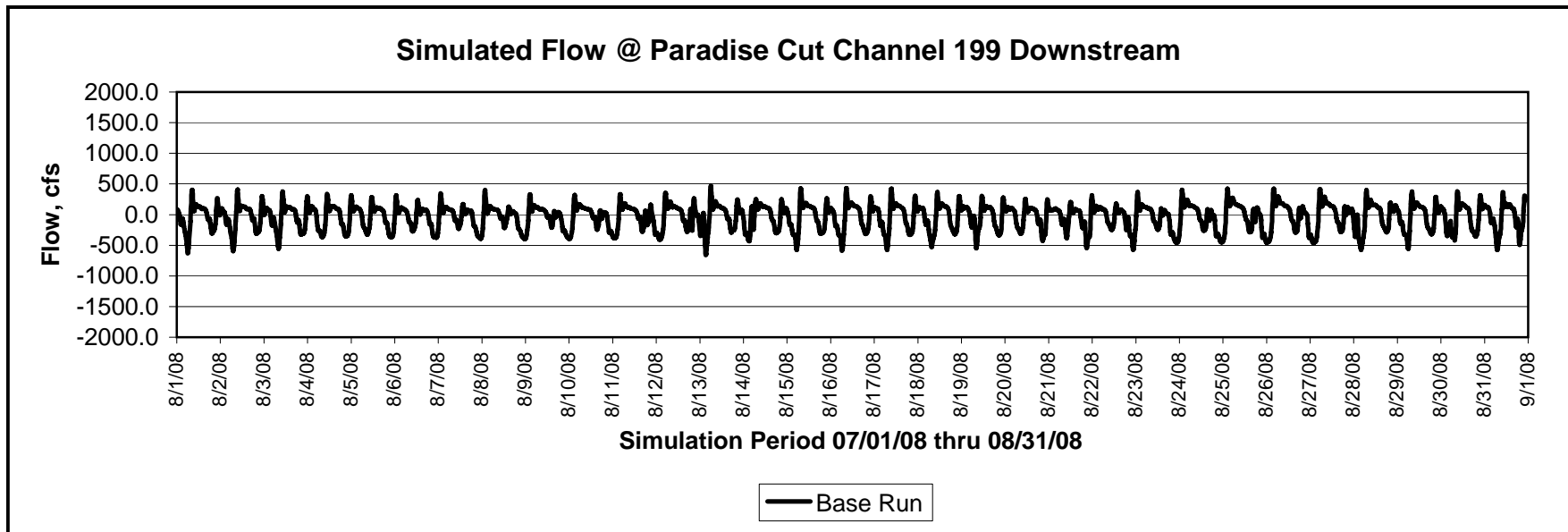
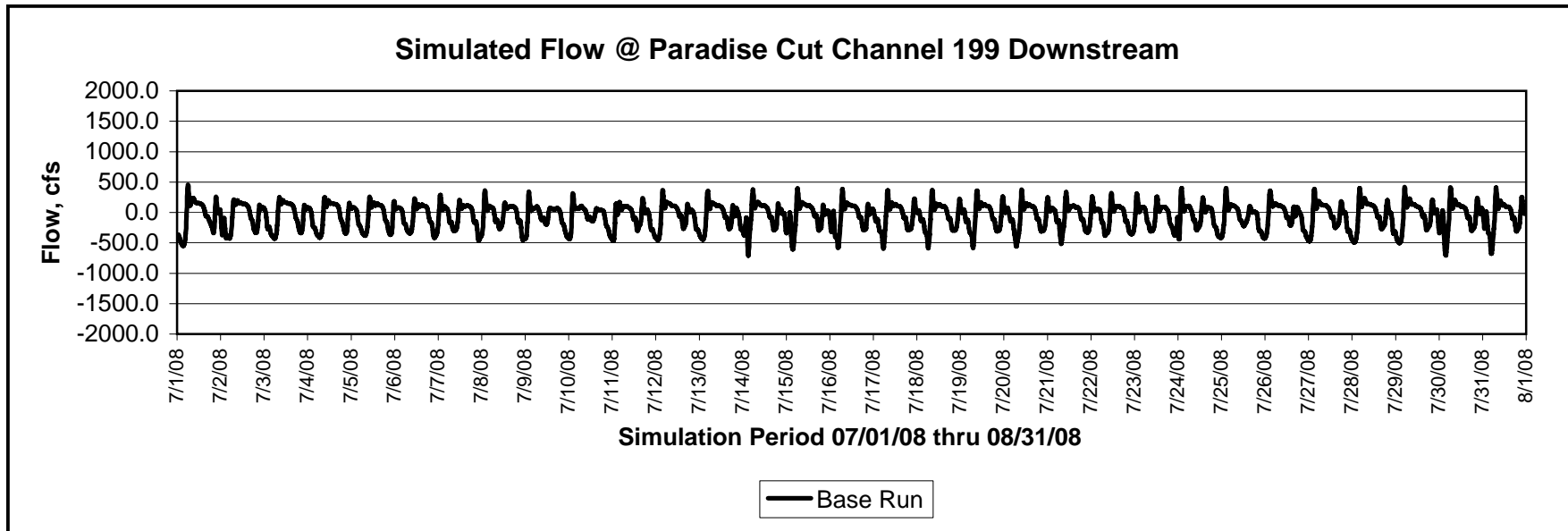


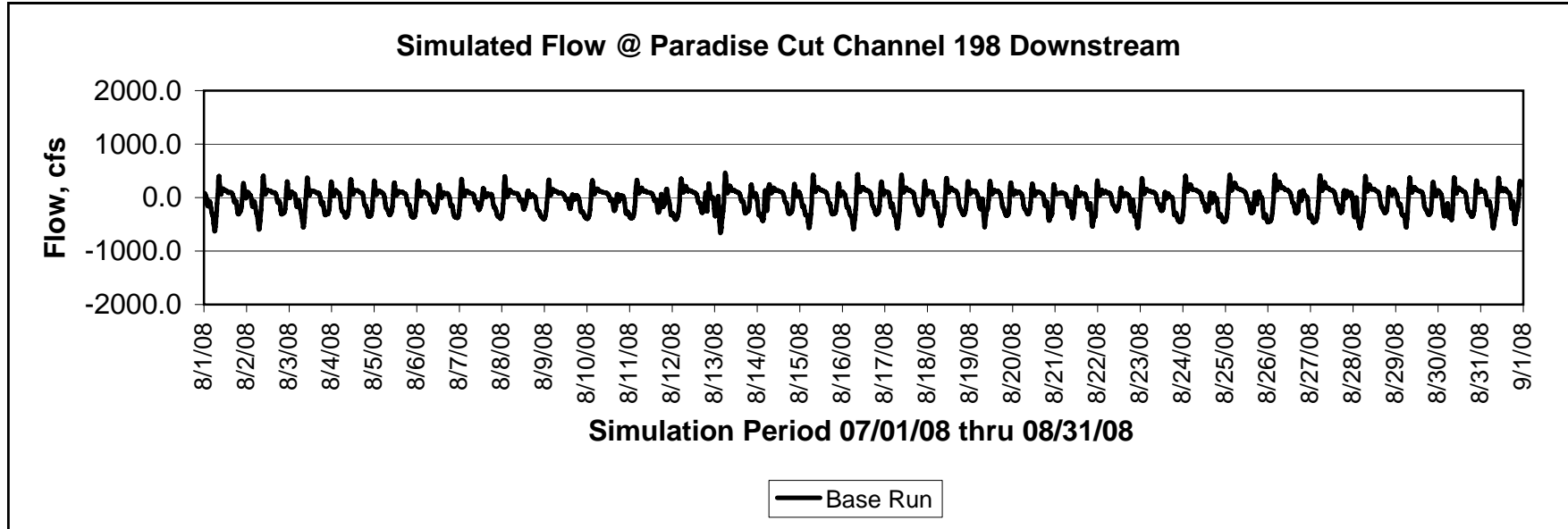
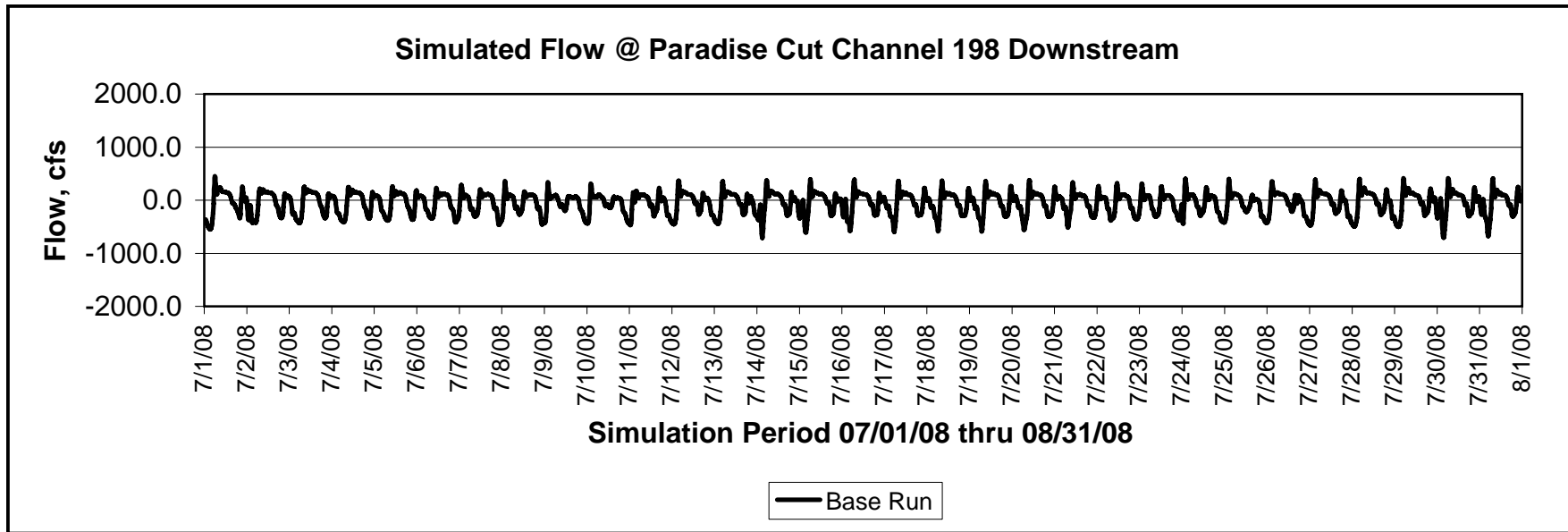


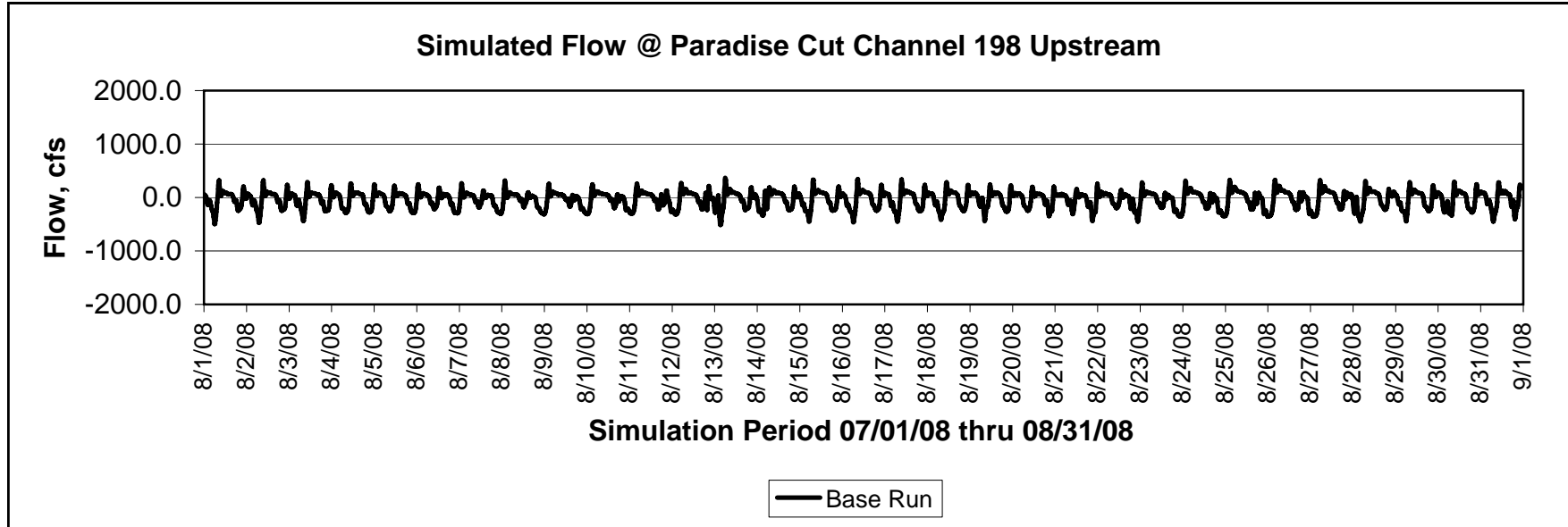
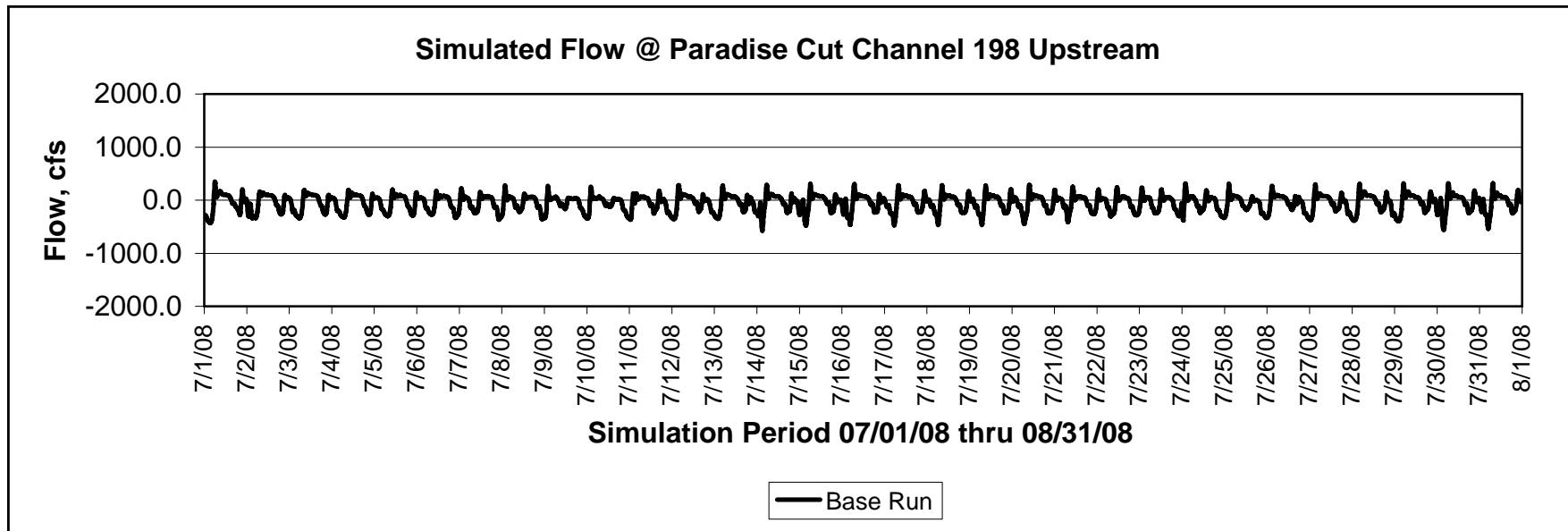
PARADISE CUT- FLOW

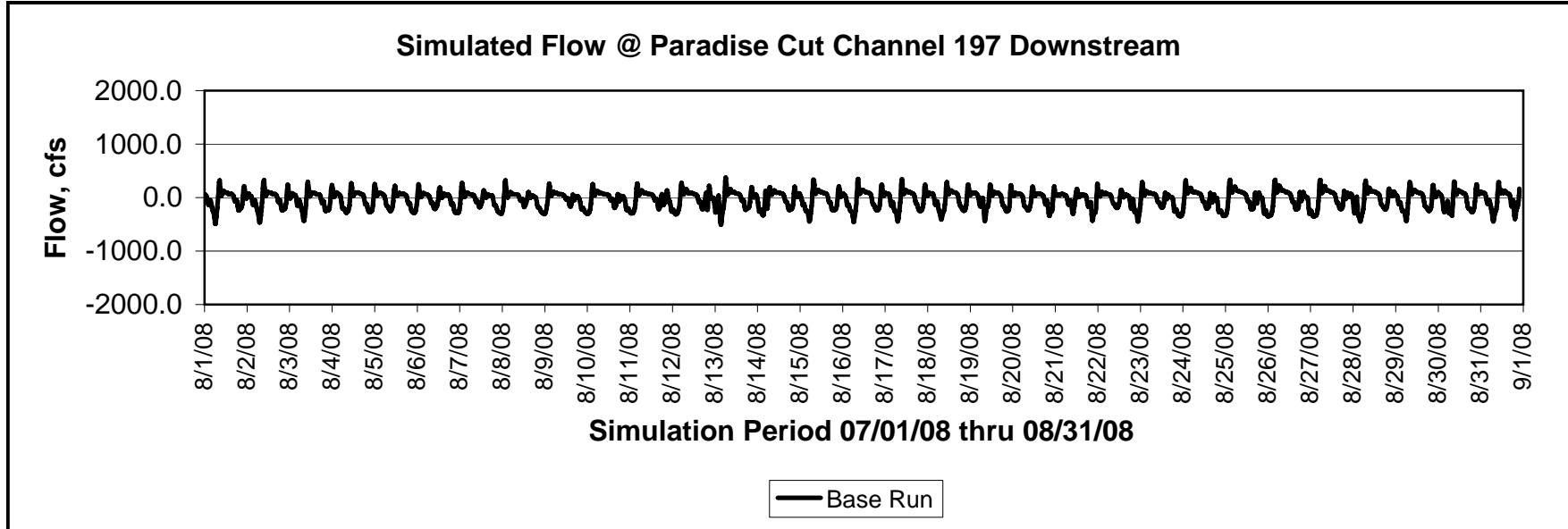
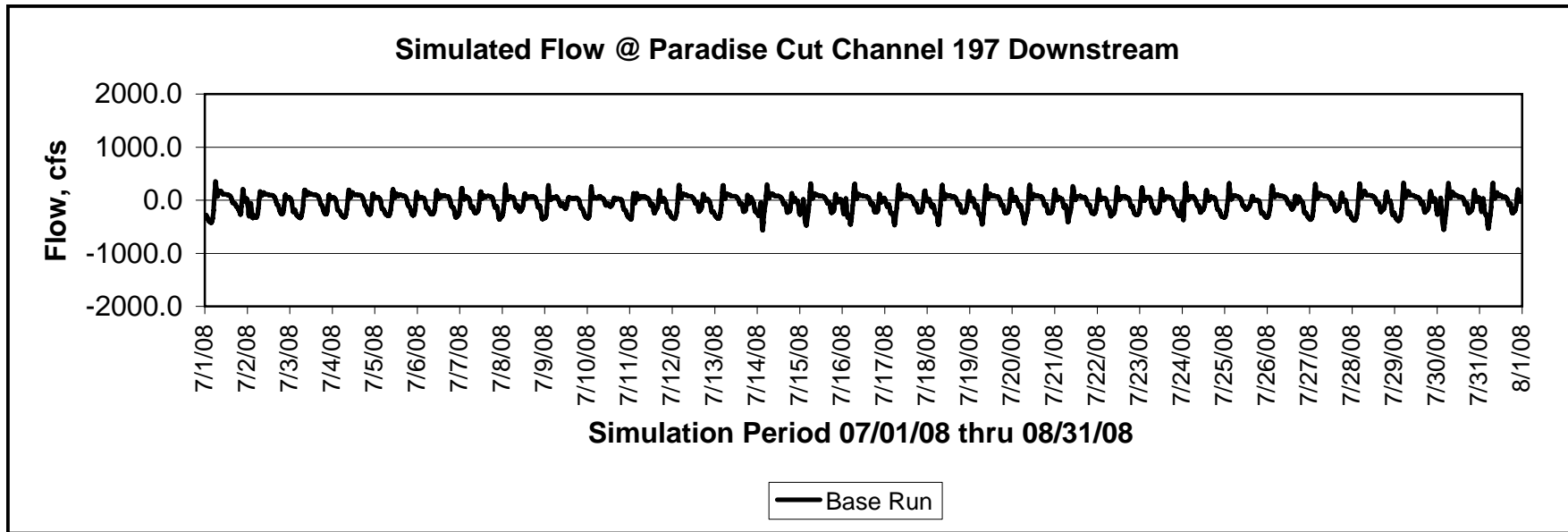


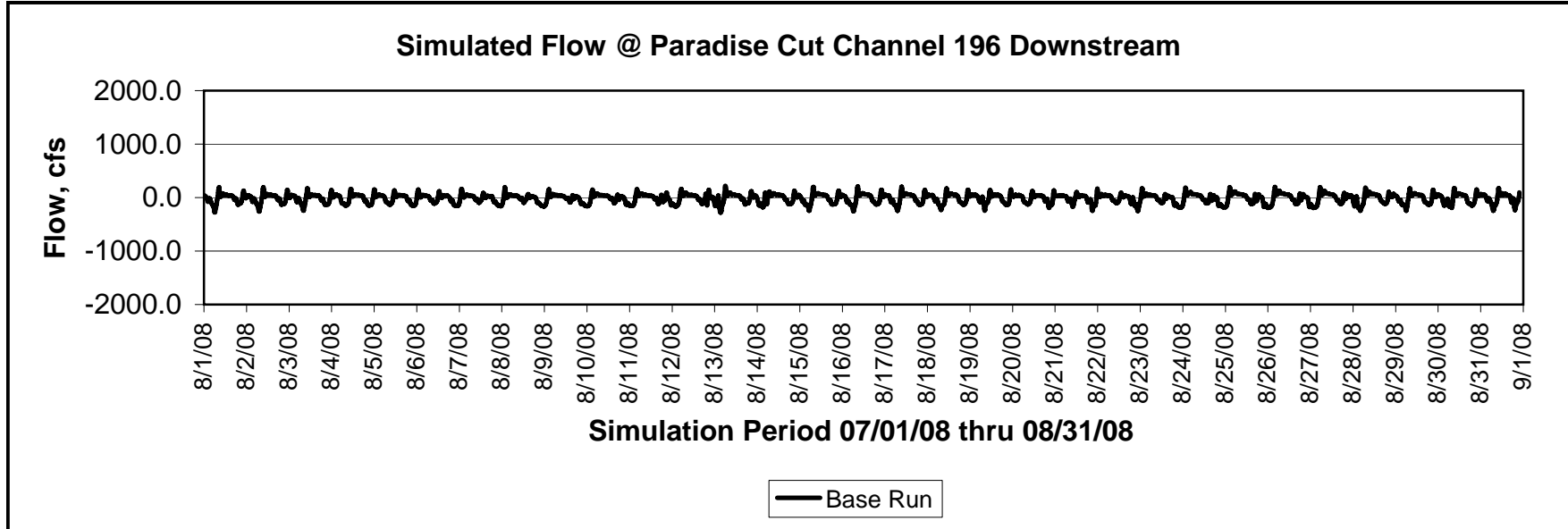
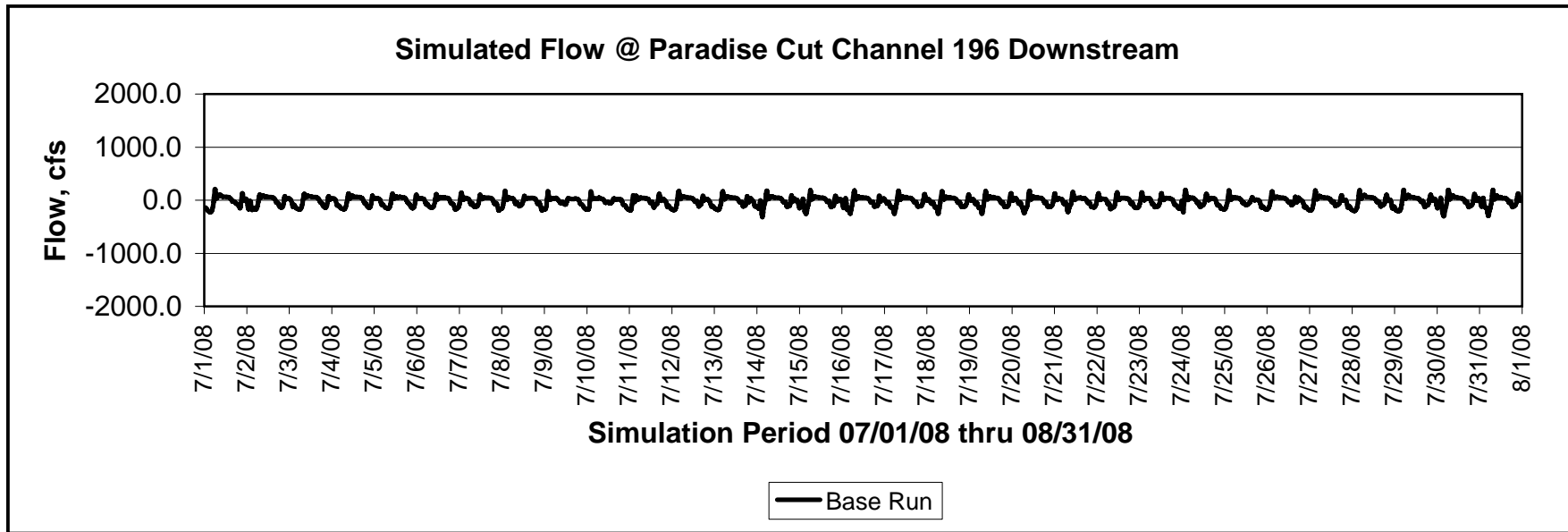


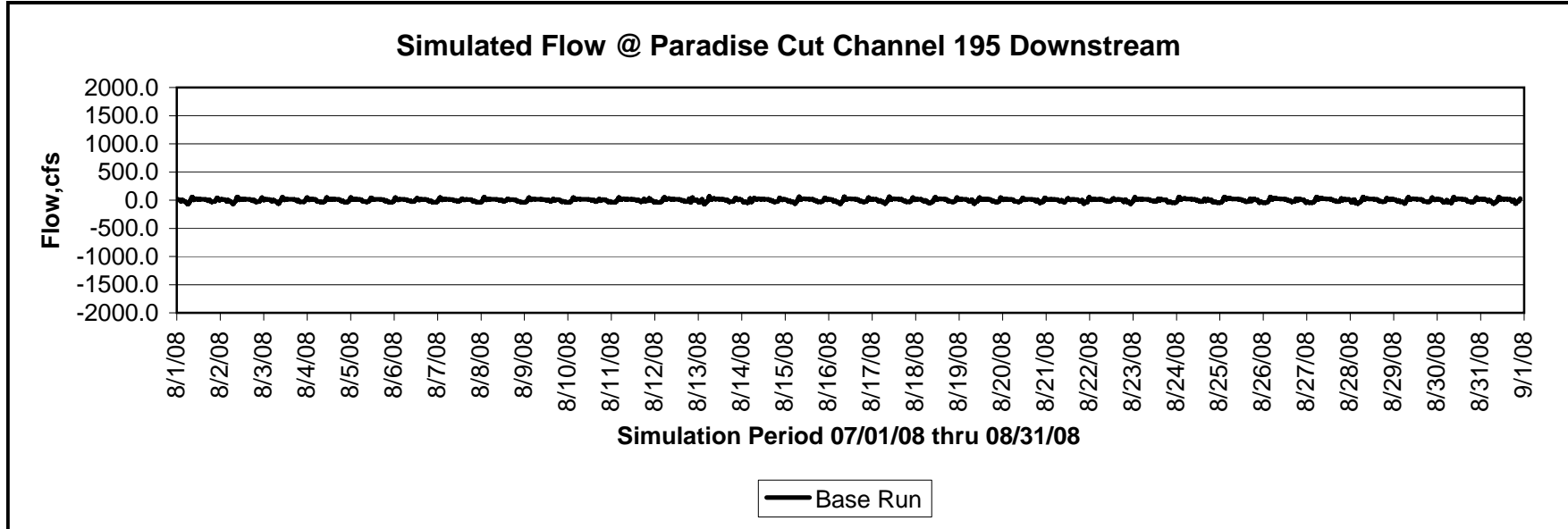
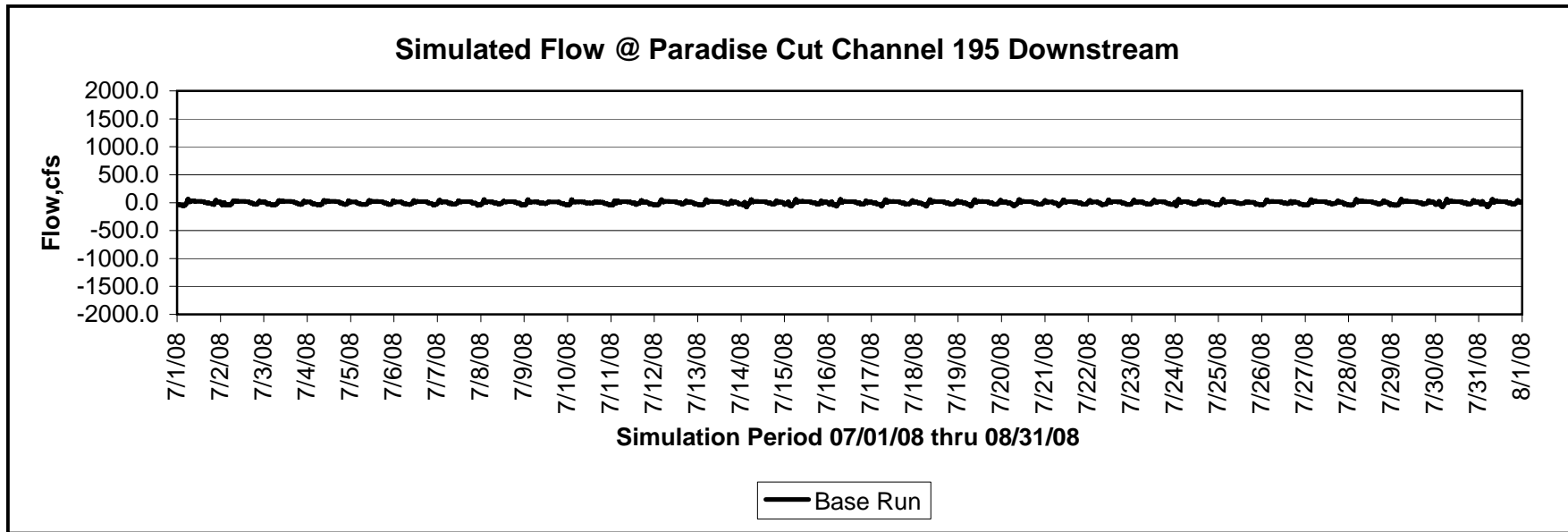




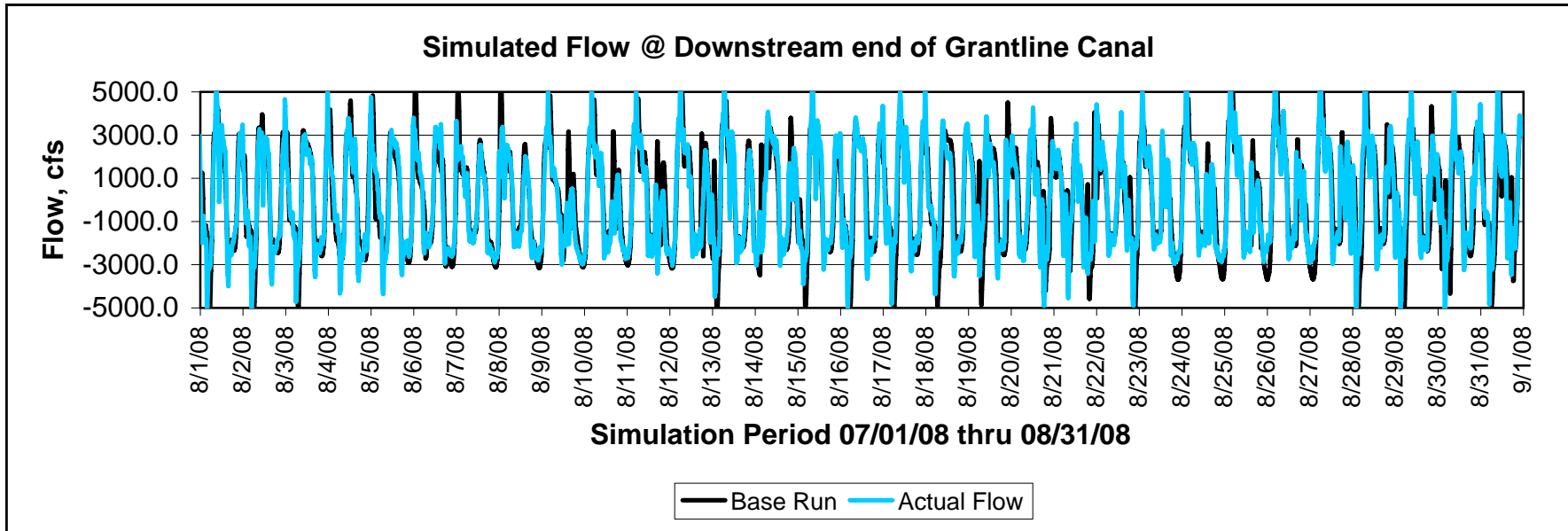
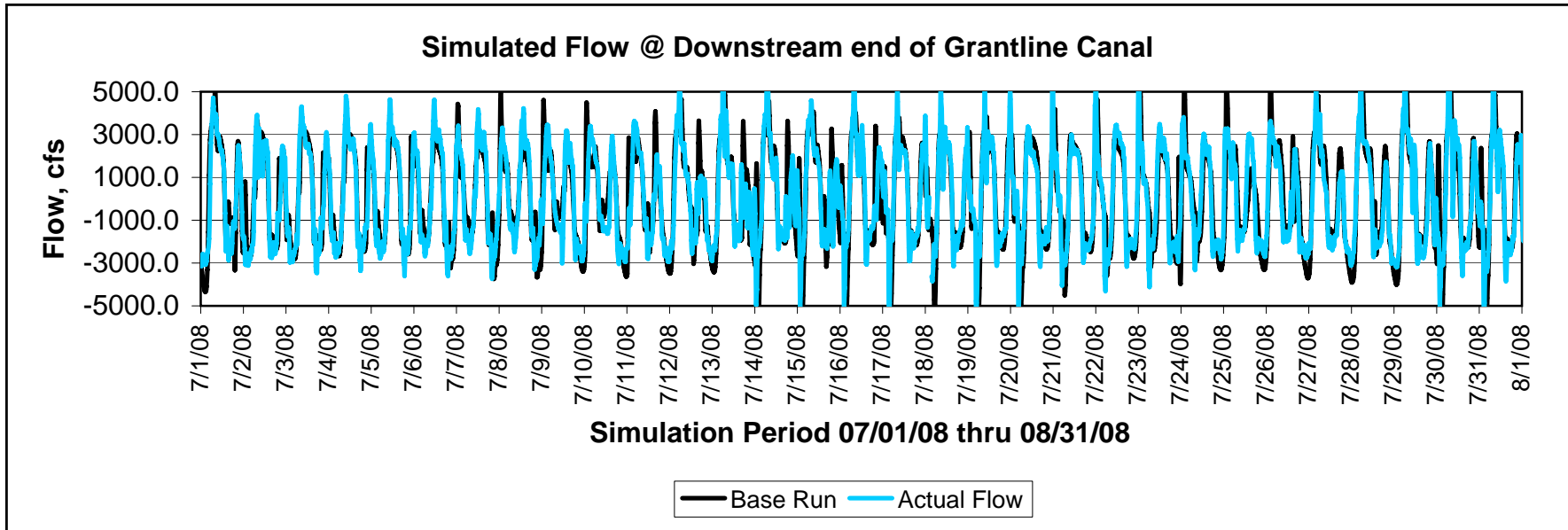


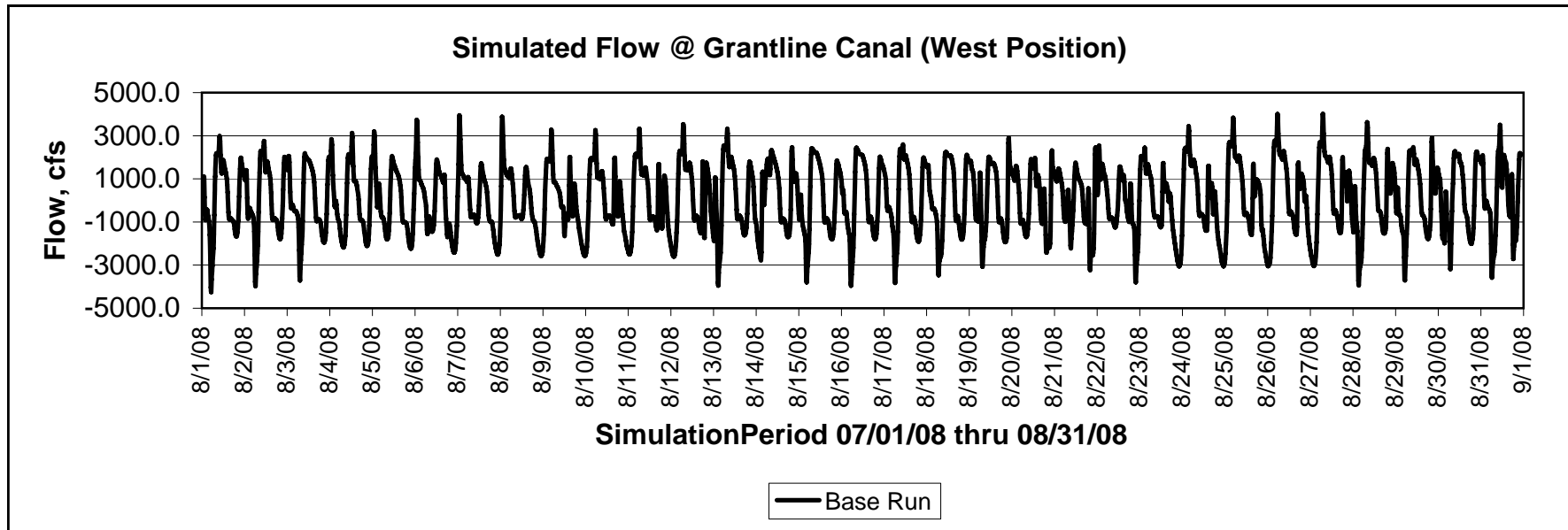
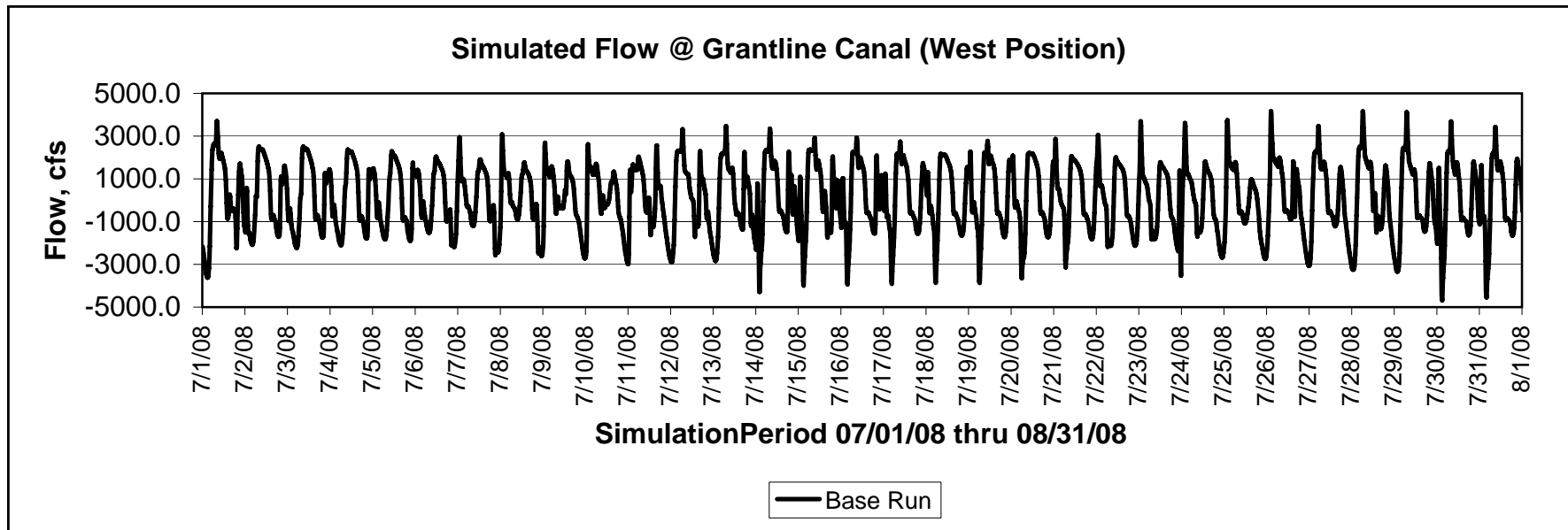


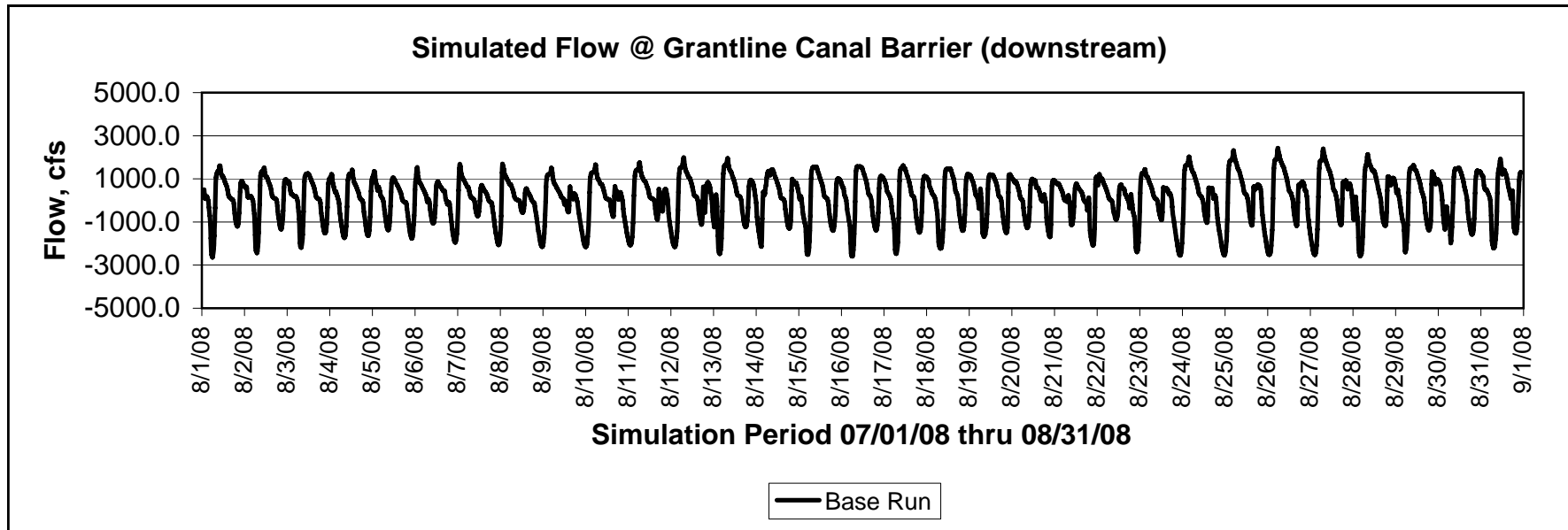
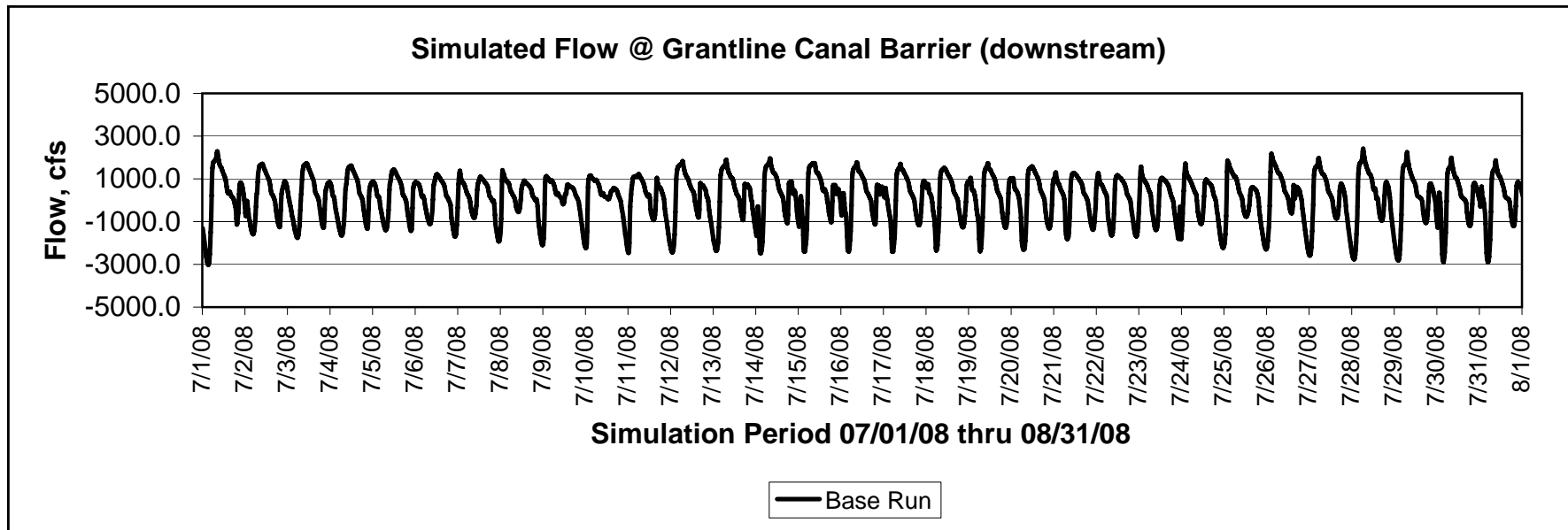


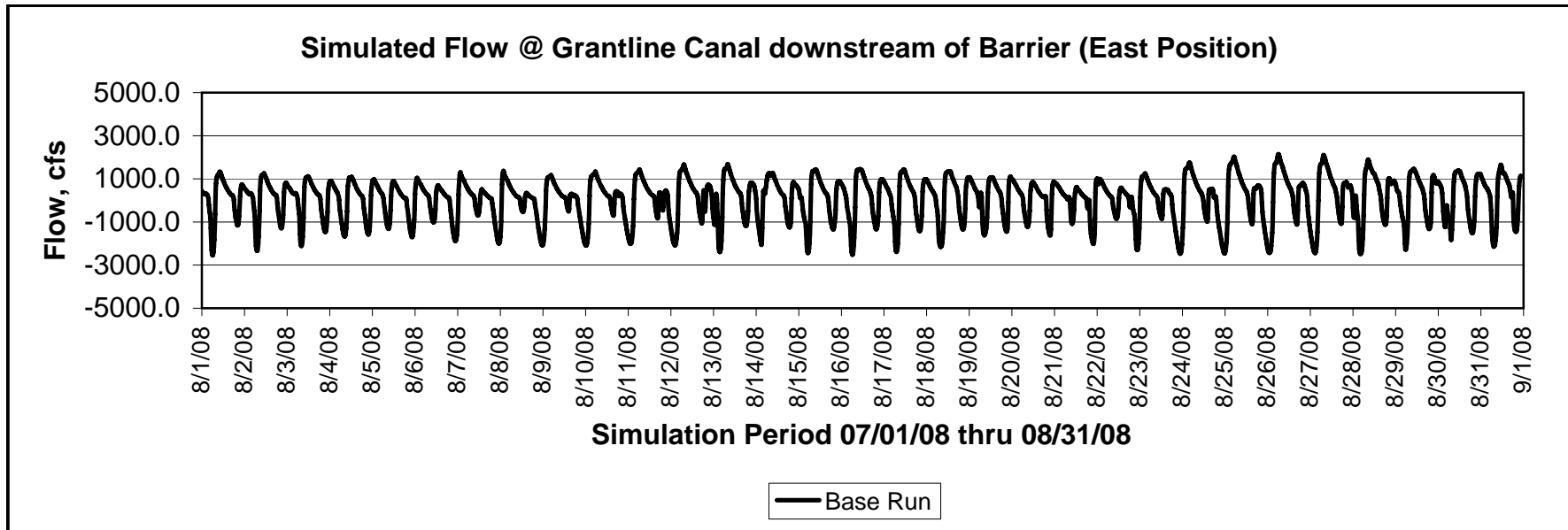
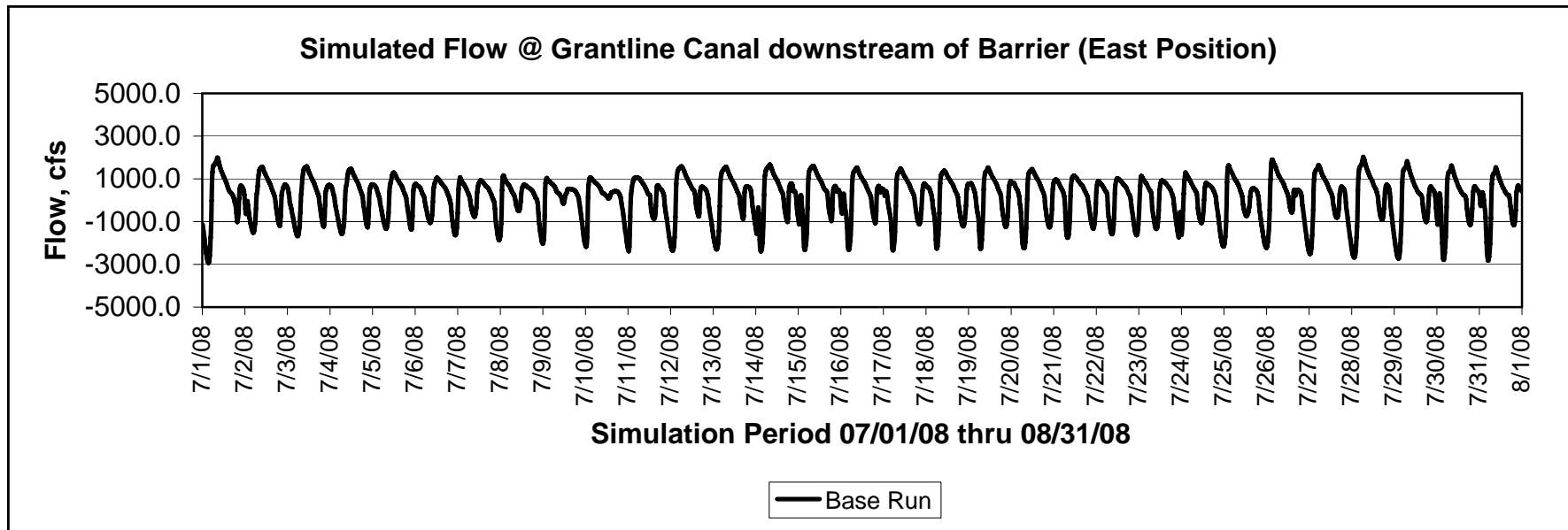


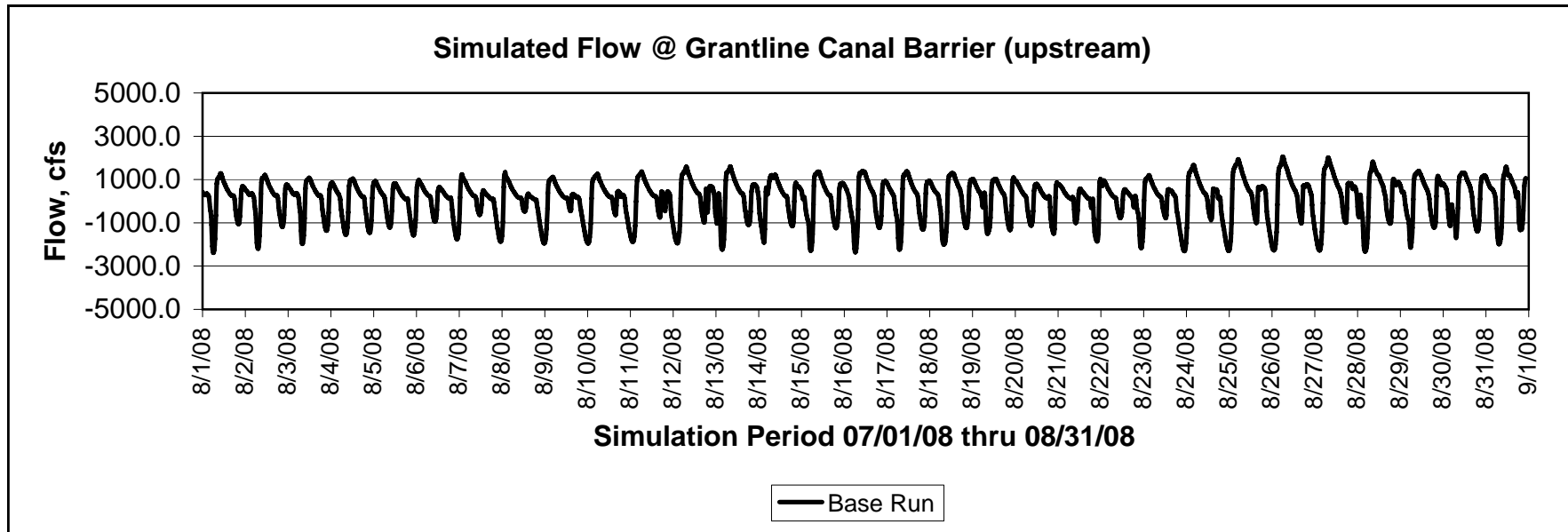
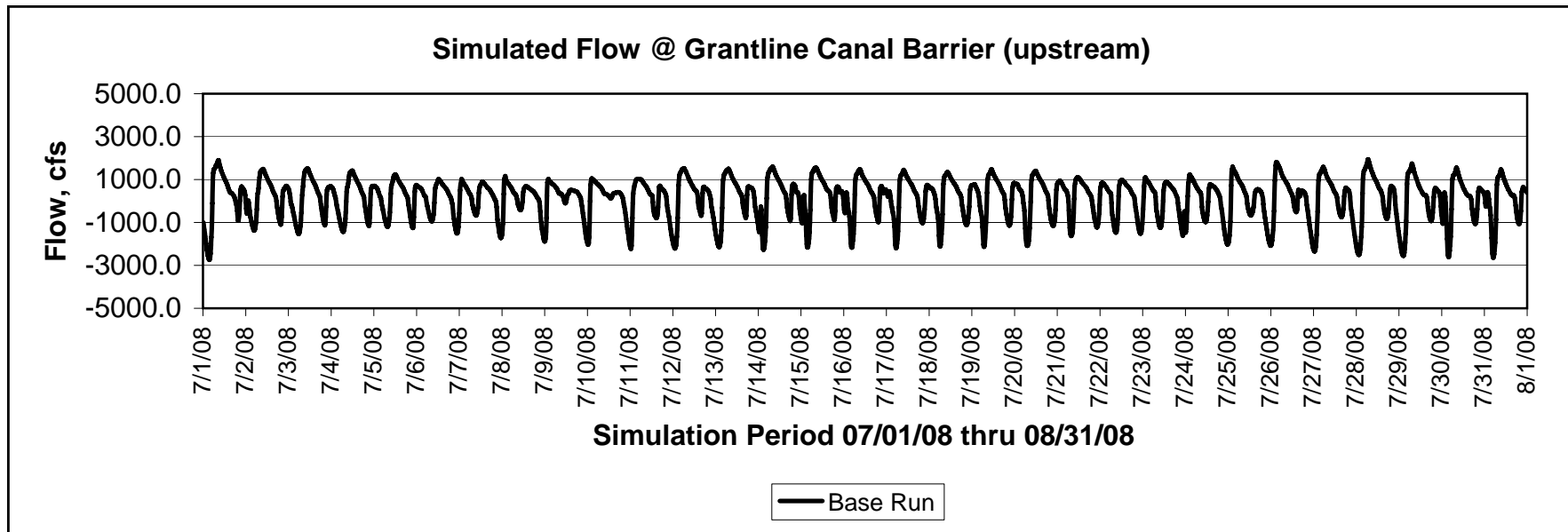
GRANTLINE CANAL - FLOW

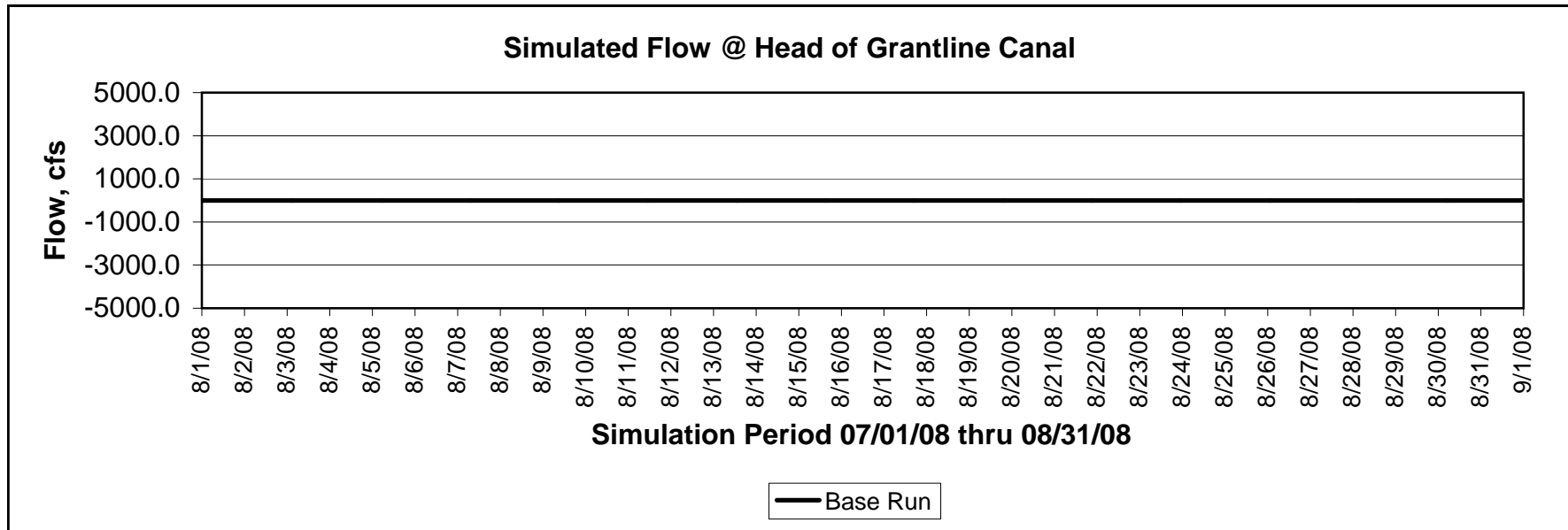
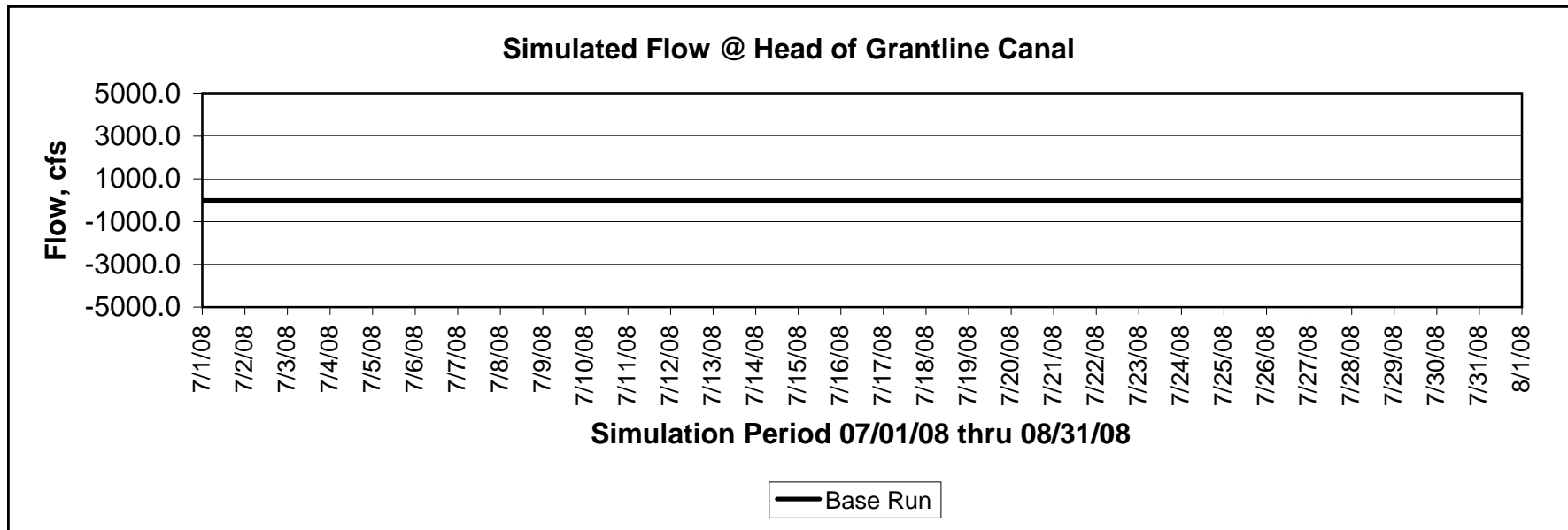


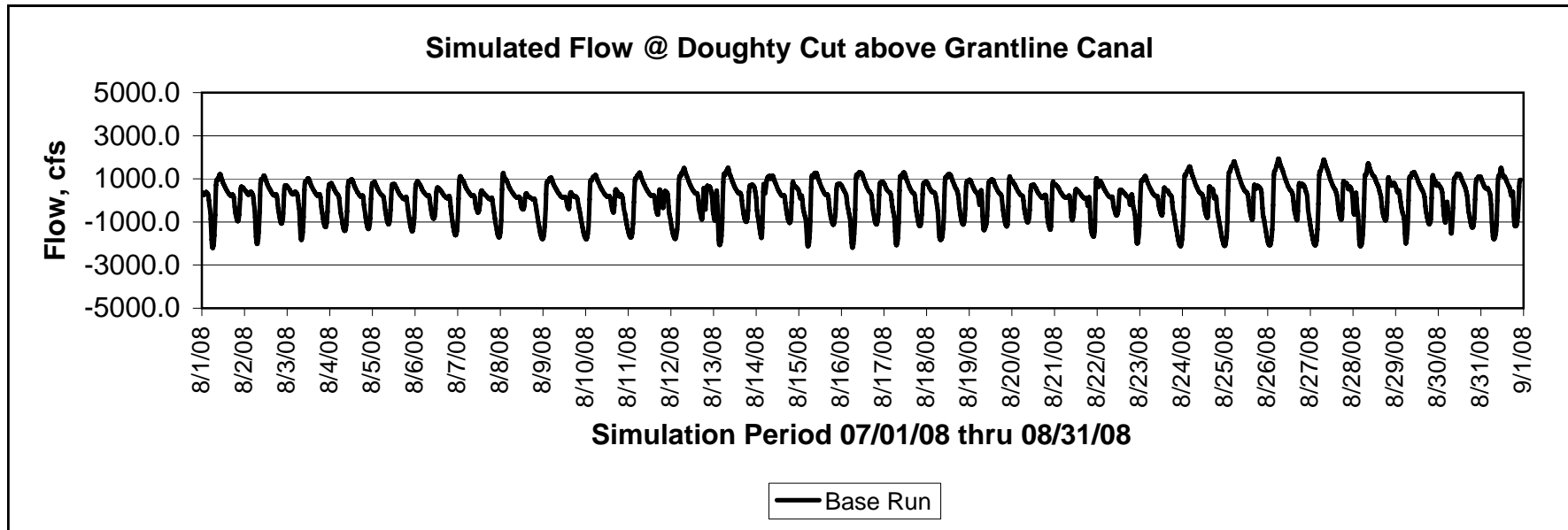
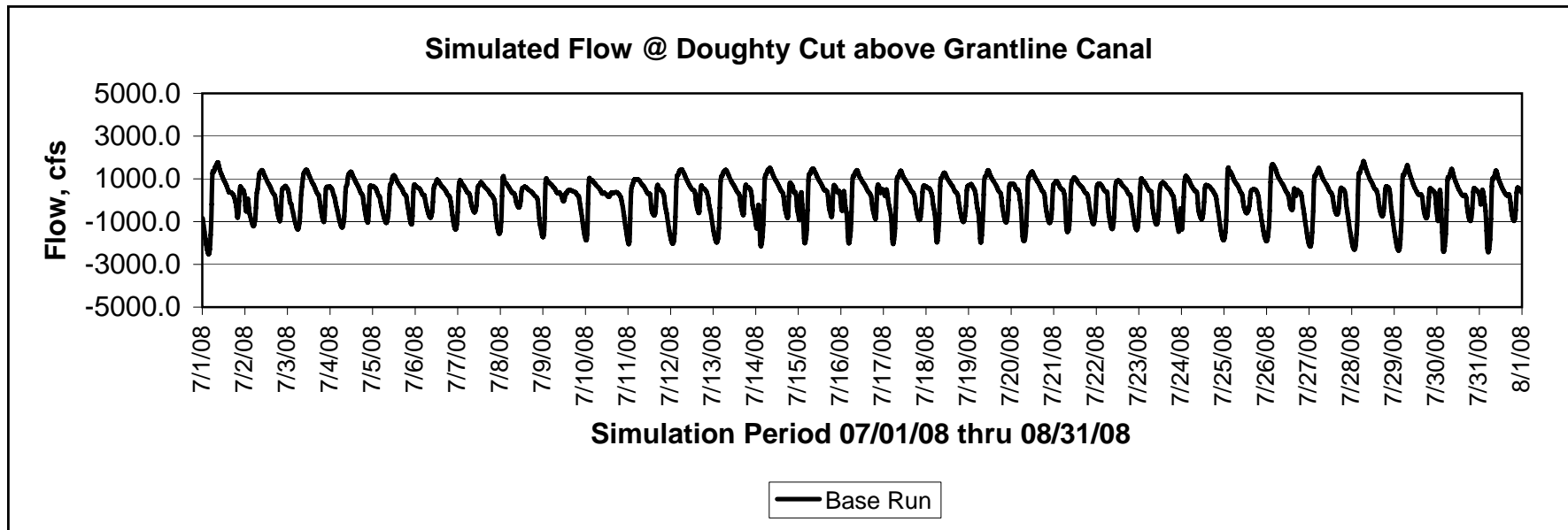












SAN JOAQUIN RIVER - FLOW

