Georgia Department of Natural Resources
2 Martin Luther King Jr. Drive, Suite 1152 East Tower, Atlanta, Georgia 30334
Noel Holcomb, Commissioner
Carol A. Couch, Ph.D., Director
Environmental Protection Division
(404) 656-4713

April 9, 2007

Colonel Peter Taylor
Commander and District Engineer
Department of the Army
Mobile District, Corps of Engineers
190 Saint Joseph Street
Mobile, Alabama 36602-3630

Re: Corps ACF Operations Under the IOP

Dear Colonel Taylor:

Governor Perdue and I have expressed to the Corps of Engineers and the Fish and Wildlife Service on many occasions since the spring of 2006 Georgia's serious concerns about the Corps' Interim Operations Plan (IOP) for the ACF reservoirs. We remain deeply concerned. The Corps' various modifications of the IOP since March 2006 have not fixed its fundamental flaws and potentially devastating consequences. Currently, reservoir levels and basin inflows in the ACF Basin are even lower than those that we were experiencing at this time in 2006 and are comparable to the 2000-2001 time period, and our data indicates that applying the IOP under such conditions could be very harmful. The Corps must take immediate action, in consultation with the Fish and Wildlife Service, to curtail unjustified and wasteful releases under the IOP and ensure that the vital needs that depend on stored water throughout the ACF Basin can be met during drought.

The fundamental flaw in the IOP is that it causes the Corps to release substantially all basin inflows into the ACF Basin during dry periods. This means that the reservoirs cannot refill and are actually lowered heading into the summer, when, if conditions remain dry, the IOP requires the Corps to augment (release more than) basin inflows. Last summer, when basin inflows dropped below 5,000 cfs on 84 days (even falling to below 2,000 cfs on 6 days), the Corps had to make substantial draws on reservoir storage to meet the mandatory minimum flow of 5,000 cfs.

We have raised our issues with the IOP repeatedly. I sent the Corps and the Service five separate letters during May and June of 2006 expressing our concerns that the IOP could drain the ACF reservoirs. When the Corps failed to address our concerns, Georgia filed suit against the Corps on June 20, 2006. That litigation is still pending. On August 28, 2006, I provided you with a memorandum by Dr. Douglas Peterson, a sturgeon expert at the University of Georgia, explaining that there was no science

supporting the high flows that the IOP prescribes for the Gulf sturgeon spawning season and indicating that the Corps could significantly lower those flows without any impact on the Gulf sturgeon. I followed this up on January 8 of this year with a further request that you modify the IOP, pursuant to of the findings of the Biological Opinion, by reducing releases during the Gulf sturgeon spawning period to provide greater protection for the federal reservoirs and make more water available for releases during the summer.

The IOP resulted in a more rapid drawdown of the federal reservoirs last spring and summer than had occurred at any time in history. The Corps exacerbated matters by consistently releasing more water than the IOP required, and by its accidental release of more than 22 billion gallons of water due to a gage error. The federal reservoirs would have fallen even lower had rainfall during the fall of 2006 not improved to normal levels.

Unfortunately, extremely dry conditions have returned and with them the real threat to the ACF Basin reservoirs. I enclose with this letter an April 5, 2007 memorandum by Dr. Wei Zeng that analyzes the potential effect of the IOP (as currently revised by "Concept 5") on the federal reservoirs during the remainder of 2007 and 2008. Basin inflows thus far in 2007 are even lower than those that we experienced in 2006 and are comparable to what we experienced in the year 2000. Basin inflows for 2006 and 2007 are tracking those for 2000 and 2001. It is reasonable for us to assume that we could be entering or be in the midst of a multi-year drought that will resemble 1999-2001 conditions. As Dr. Zeng's analysis shows, if we model the IOP using year 2000 and 2001 hydrological conditions for the rest of 2007 and 2008, Lakes West Point and Walter F. George are effectively emptied and Lake Lanier drops to 16 feet below the top of conservation (a level that is more than 5 feet lower than reached in 2006 and is even lower than in 2000, when the Corps made a dramatically costly navigational release during the drought). If we were to assume that the Corps releases even more than the IOP requires, as it did throughout 2006, the results would be even worse.

The high levels of releases under the IOP are unjustified and are unsustainable. If there were any scientific evidence that the Gulf sturgeon would be negatively affected by curtailing releases during the Gulf sturgeon spawning period, there might be room for debate over the balance between man's needs and those of the endangered species. But no evidence exists that the Gulf sturgeon needs the flows that the Corps is providing, and thus no need to consider such a balancing. Combined with the other flow requirements of the IOP, the raising of the minimum flow to 6,500 cfs under certain conditions could result in the costly loss of additional storage.

Based on the voluminous scientific data and modeling that is in the record of the Corps' Section 7 consultation in this matter, including the information that Georgia has provided in the above-referenced correspondence, the following alterations to the IOP are needed:

1. The Corps should establish flow thresholds that are soundly supported by the best available scientific information. For the months of March through May, the best available scientific information appears to be the 2006 Gulf sturgeon egg collection data. Based upon these data, flows of approximately 10,000 cfs to 11,000 cfs appear to be adequate and potentially preferable to higher flows for

Gulf sturgeon spawning habitat. For the period of June-February, the best available information would appear to show that there may be benefits to providing flows in excess of 5,000 cfs when the water is available to provide it while maintaining safe reservoir levels, but the Corps must be cautious of providing such higher flows particularly during droughts and must have as its highest priority maintaining sufficient storage to refill the reservoirs and thereby ensure that the 5,000 cfs can be maintained at all times.

2. If it does not replace the IOP entirely, at a minimum the Corps should make the following specific adjustments to the flow thresholds under the IOP: (A) for the Gulf sturgeon spawning season, establish 10,000 to 11,000 cfs as the desired flow when inflow permits, and store inflows above this level; (B) avoid releases above 23,000 cfs except when necessary for flood control operations; and (C) for the months of June-February, store 100% of inflow above the 5,000 cfs minimum flow unless reservoir levels are such that, based upon best available climate forecasts, the reservoirs are likely to refill during the following spring.

3. Loosen rampdown rate restrictions and offset loss of storage due to rampdown by releasing less than actual basin inflow as basin inflow rises and peaks and at other times.

4. Establish as a primary factor determining reservoir release rates the current reservoir levels (for Lake Lanier in particular, given its size and limited drainage area) and remaining system storage. When there is sufficient water in storage so as to not prevent refilling of the federal reservoirs, the Corps can and should provide higher flows than 10,000-11,000 during the Gulf sturgeon spawning season and 5,000 cfs during the non-spawning season, in conjunction with other purposes.

5. At all times, avoid releases in excess of the flow thresholds that are ultimately established.

Your timely response will be appreciated, and is warranted in light of the likelihood of rapidly declining conservation storage during this time of drought.

Sincerely,

Carol A. Couch

cc: Governor Sonny Perdue
Brig. Gen. Joseph Shroedel, Commander, South Atlantic Division,
U.S. Army Corps of Engineers
Ms. Gail Carmody, United States Fish and Wildlife Service

Memorandum

To: Carol Couch
From: Wei Zeng
Date: April 5, 2007
Re: IOP Concept 5 operation for the rest of year 2007

The purpose of this memorandum is to provide you with a summary of our analysis of what would happen in the Apalachicola-Flint-Chattahoochee (ACF) River Basin if the hydrological conditions of years 2000 and 2001 take place for the rest of this year and 2008. The Army Corps of Engineers Mobile District (Corps) is implementing its revised Interim Operation Plan (IOP) after adopting suggestions made by the US Fish and Wildlife Service (Service) in its Biological Opinion. The Corps named this revised IOP Concept 5.

Model Setting and Assumptions

We have constructed a HEC-5 model reflecting the current water use conditions within the ACF Basin. The minimum release requirement at Jim Woodruff Dam was derived according to the provisions of Concept 5.

The assumptions in this model are listed below.

1. Georgia year 2000 Municipal and Industrial demands
2. Georgia dry year agricultural water demands
3. Alabama 2000 demands
4. Florida estimated 2000 demands
5. Peachtree Creek control point minimum flow requirement of 750 cfs
6. Columbus control point minimum flow requirement of 1850 cfs (unless West Point elevation is lower than 621.6 feet, when the flow requirement is reduced to 1200 cfs)
7. Lanier, West Point, and Walter F. George are balanced per proposed 1989 Water Control Plan zones
8. Firm hydropower generation as specified by Colonel Pete Taylor's letter dated June 12th, 2006
    a. Zone 1: Lanier 3 hrs / WP 4 hrs / WFG 4 hrs
    b. Zone 2: Lanier 2 hrs / WP 2 hrs / WFG 2 hrs
    c. Zone 3: Lanier 2 hrs / WP 2 hrs / WFG 2 hrs
    d. Zone 4: No firm power generation
9. Jim Woodruff release requirement set by IOP Concept 5
10. Chattahoochee, Florida stage fall rate limitation set by IOP Concept 5
11. Initial conditions set as reservoir elevations on April 3, 2007
12. Year 2000 and 2001 hydrological conditions for the rest of 2007 and 2008

It is worth noting that hydrological conditions across the entire ACF Basin do not allow us to be optimistic. We are in a second year of a dry period, and the entire Basin is under abnormally dry condition (D0), according to the U.S. Drought Monitor (Fig. 1). National

Oceanic and Atmospheric Administration's (NOAA) short-term forecast clearly indicate the lack of normal precipitation at least in the next month (Figs. 2 through 4). A comparison of 2007 ACF Basin Inflow and other known drought years indicates that basin-wide conditions are not any better than in 2000, 1999, and 2006 (Figs. 5 through 7). Another comparison between the Basin Inflow of 2006-2007 and the BI in the 1999-2001 drought clearly shows a similarity between the two (Fig. 8).

We are very likely on track to a multi-year drought. So, it is reasonable to assume the most severe drought conditions for the rest of the year (and beyond) in our analysis. Our model is with the assumption that the hydrology of 2000 and 2001 takes place in the rest of 2007 and 2008.

Model Results and Discussion

Figs. 9 through 15 show the reservoir elevations resulting from operations under IOP Concept 5 and 2000-2001 hydrology. For comparison, we have overlaid simulated reservoir elevations on top of observed values. We made comparisons in two different ways. First, we overlaid simulated 2007 and 2008 conditions on top of reservoir elevations observed in the 2000-2001 drought. Then, to further assess the impact of IOP Concept 5 in comparison with the IOP operations implemented in 2006, we connected observed elevations in 2006 and early 2007 with simulated values for the rest of 2007 and 2008.

Fig. 9 depicts Lanier elevation dropping precipitously throughout much of the year until it reaches a level (just above 1055 feet) lower than seen in the year 2000. It then stays around 1055 feet for almost four months before starting to recover. Note that the observed 2000 low elevation was the result of a much-criticized navigation release in that year. What the model is telling us is that even if the Corps accurately executes the operations prescribed by IOP Concept5, the impact of the IOP Concept 5 on Lanier would be worse than the 2000 navigation release. The Corps has stated in both its Biological Assessment and the Environmental Assessment that the flow requirements prescribed by the IOP Concept 5 are minimums, instead of targets. This means the simulation results, as bad as they are, still underestimate the risks.

Presenting the same simulated scenario from a different perspective, Fig. 10 shows observed Lanier elevation in 2006 and early 2007 (in magenta) followed by simulated elevation for the rest of 2007 and 2008 (in blue). The IOP was first implemented in 2006, and its impact to the ACF system was apparent. In the past year, we have seen a historical loss of storage in a matter of a few months. The system storage recovered only because of near normal precipitation in the later part of 2006. What this analysis is telling us is that if the hydrological conditions of 2000-2001 take place in the ACF Basin for the rest of 2007 and 2008, we can expect Lanier low elevation to be more than 5 feet lower than in 2006, as a result of operations under the IOP Concept 5.

Fig. 11 shows West Point elevation being much lower compared to observations made in 2000 and 2001. West Point elevation would drop throughout most of the year and reach

the lowest point (621 feet) around early December 2007. At this point, West Point would be only one foot away from the bottom of its conservation pool. The average West Point elevation for the period of simulation (the rest of 2007 and 2008) would be 4.7 feet lower than that of the observation in 2000 and 2001.

Fig. 12 depicts observed West Point elevation in 2006 to early 2007 followed by simulated elevation in the rest of 2007 and 2008. West Point was able to escape devastating low elevations because of near normal precipitations in the later part of 2006. However, if the 2000 hydrology is to repeat itself in the rest of 2007, and if the Corps implements the IOP Concept 5, we can expect to see a low West Point elevation of 621 feet, almost seven feet lower than in 2006.

As a result of operations under IOP Concept 5, Walter F. George elevation would decline precipitously and reach 185 feet (only one foot away from empty) by early August. It would stay below 185 feet for about four months, in which it would be only inches away from the bottom of the conservation pool for numerous times (Fig. 13).

Fig. 14 shows observed Walter F. George elevation in 2006 to early 2007 followed by simulated elevation in the rest of 2007 and 2008. The low elevation of Walter F. George reached 186 in 2006. The lake recovered only because of near normal precipitations in the later part of 2006. With the assumption that the rest of 2007 will be like the drought year of 2000, the operations prescribed by the IOP Concept 5 will cause Walter F. George to be in a much worse shape (only inches away from its bottom of conservation pool) than in 2006 (Fig. 14).

Jim Woodruff is relatively small compared to Lanier, West Point, and Walter F. George, and it is heavily influenced by the operations of these storage reservoirs. However, the storage deficit at Jim Woodruff depicted in Fig. 14, together with similar storage deficits at all the upstream reservoirs, clearly shows a system under enormous stress from high releases and the lack of refilling, a feature that been the hallmark of all versions of the IOP, including Concept 5 (Fig. 15).

The reservoir elevations are the results of operations to meet minimum flow requirements downstream of Jim Woodruff Dam. Besides the influence of the requirements, the elevations are also affected by whether the actual flow is higher than the requirements and by how much the actual flow is higher than the requirements.

Our model (and any models without an explicit expression of over-release) does not assume the release from Jim Woodruff to be any higher than the flow requirements, as long as the reservoir elevations fall in the ranges of their respective conservation pools. This is reflected by the fact that simulated Jim Woodruff release closely follows minimum flow requirements prescribed by the IOP Concept 5 (Fig. 16).

In both the Biological Assessment (dated February 15, 2007) and Environmental Assessment (dated March 6, 2007) of the IOP Concept 5, the Corps stated that “these rules prescribe minimum requirements for releases and generally releases will be higher

than those prescribed." What this means is that the reservoir elevations resulting from this model (and any other models without an explicit expression of over-release) are an overly optimistic portrayal of what may take place, since any over-release would certainly draw more water from the reservoirs and cause lower reservoir elevations.

Conclusions

Even though the higher and middle flow thresholds (for the spawning season) in the IOP have been adjusted to lower values in the IOP Concept 5, this adjustment is not enough to provide adequate opportunities for the reservoirs to recover and refill. The adjustments made as a result of Reasonable and Prudent Measures 2 and 3 resulted in even less chance of any recovery and increased and more frequent augmentation during the non-spawning season (June through February).

At this moment, we are in the second year of a potential multi-year drought. If the hydrological conditions in the years 2000 and 2001 were to take place for the rest of 2007 and 2008, operations under the IOP Concept 5 would cause the system to be in worse conditions than observed in the 2000-2001 period. Any over-release above what is prescribed by the IOP Concept 5 is going to exacerbate the situation.

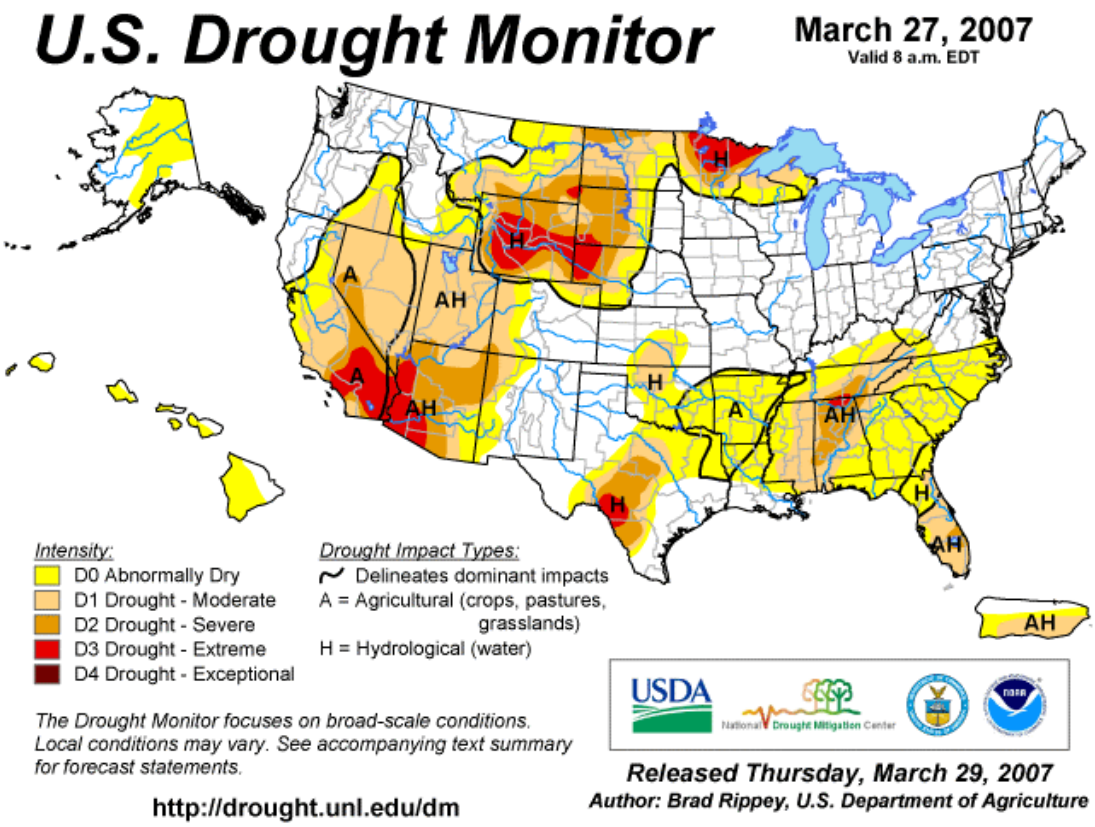

Fig. 1 US Drought Monitor

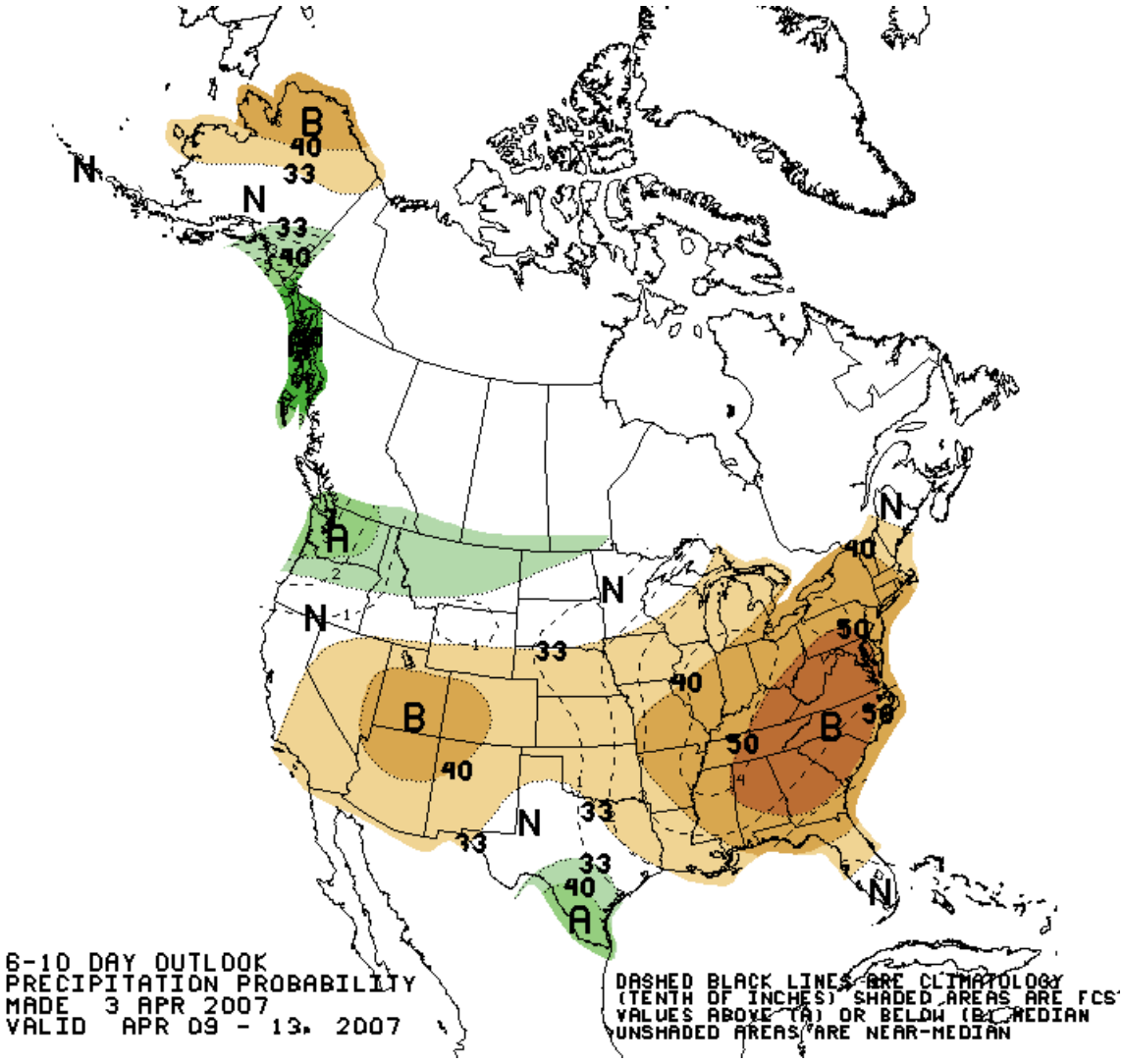

Fig. 2 NOAA 6-10 day precipitation forecast

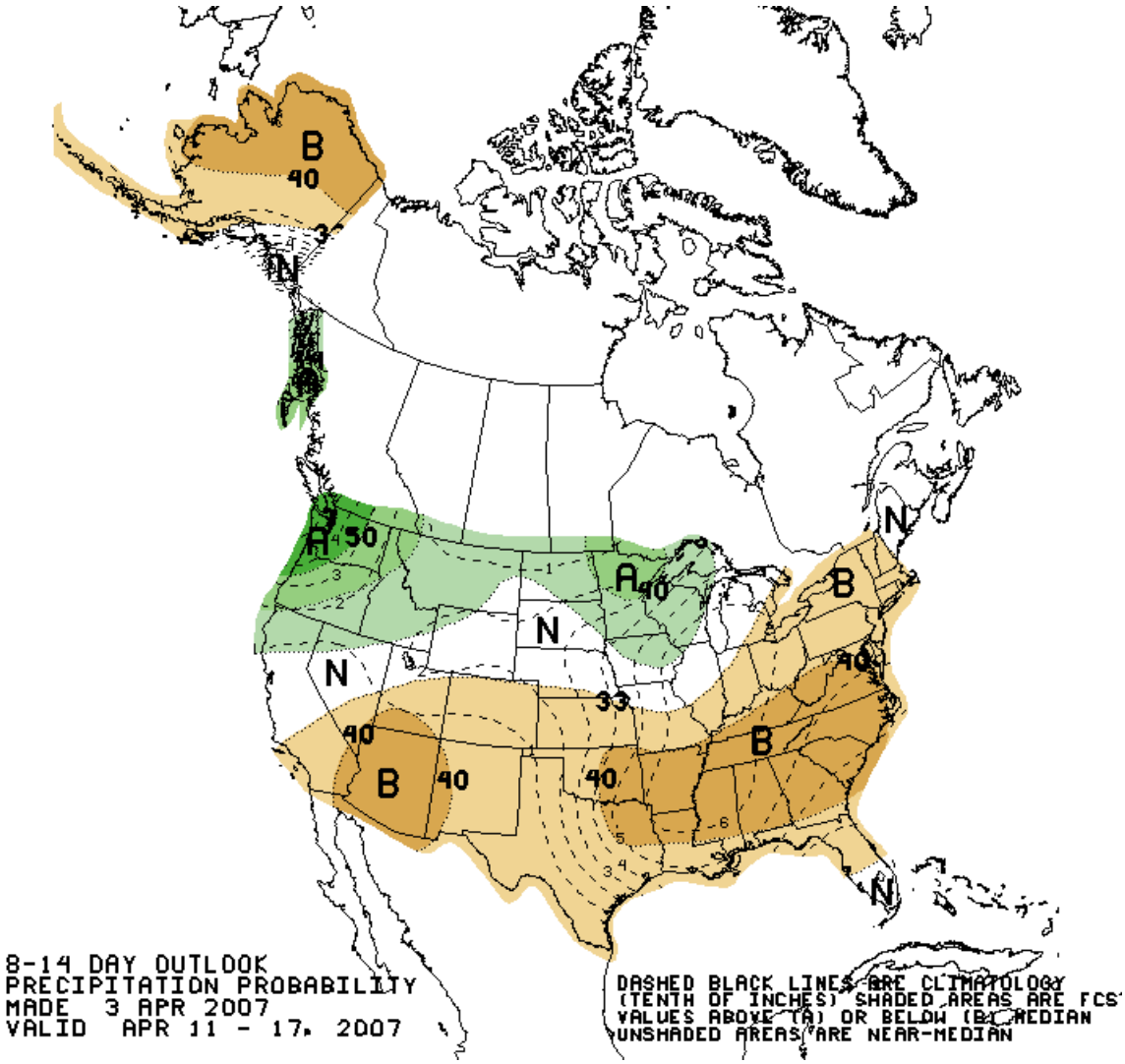

Fig. 3 NOAA 8-14 day precipitation forecast

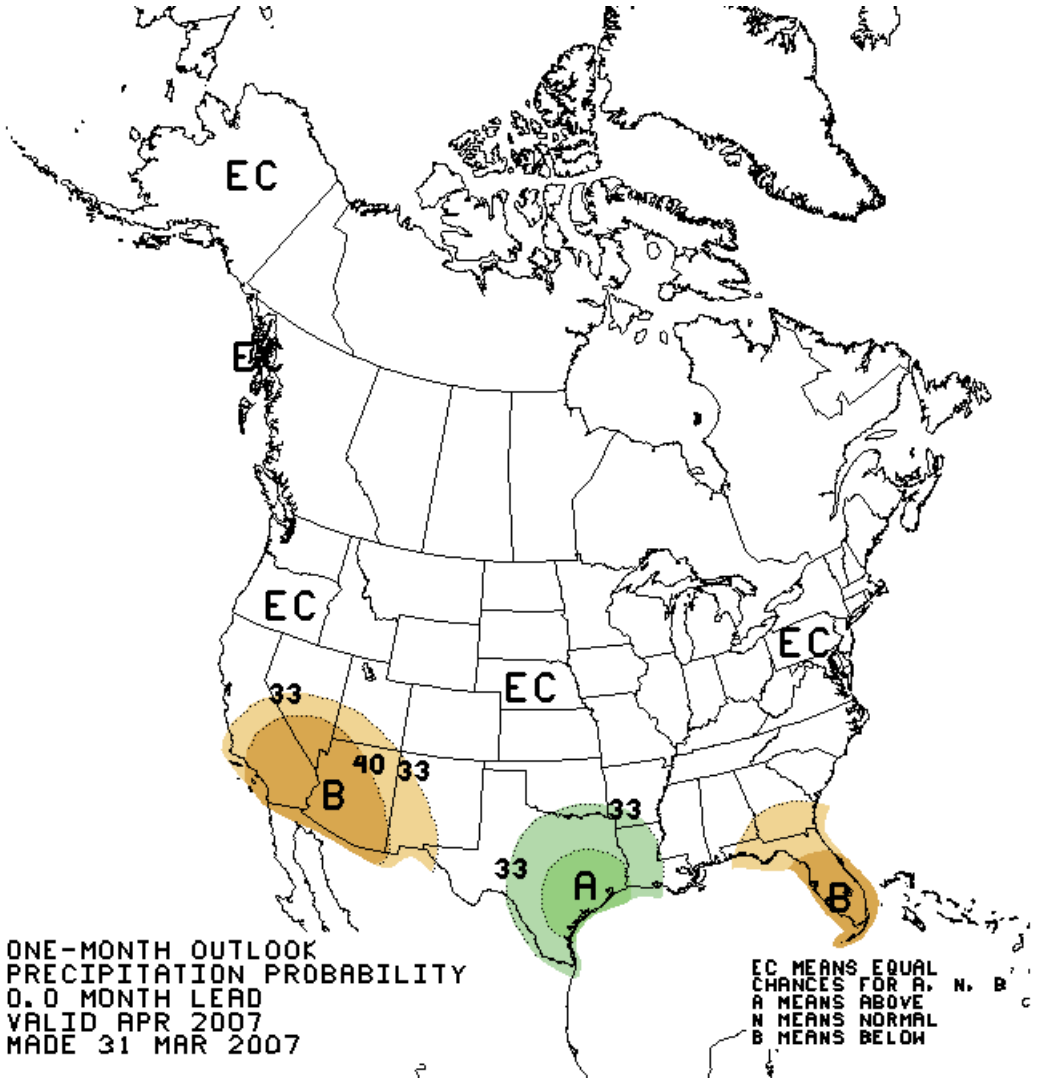

Fig. 4 NOAA 1-month precipitation forecast

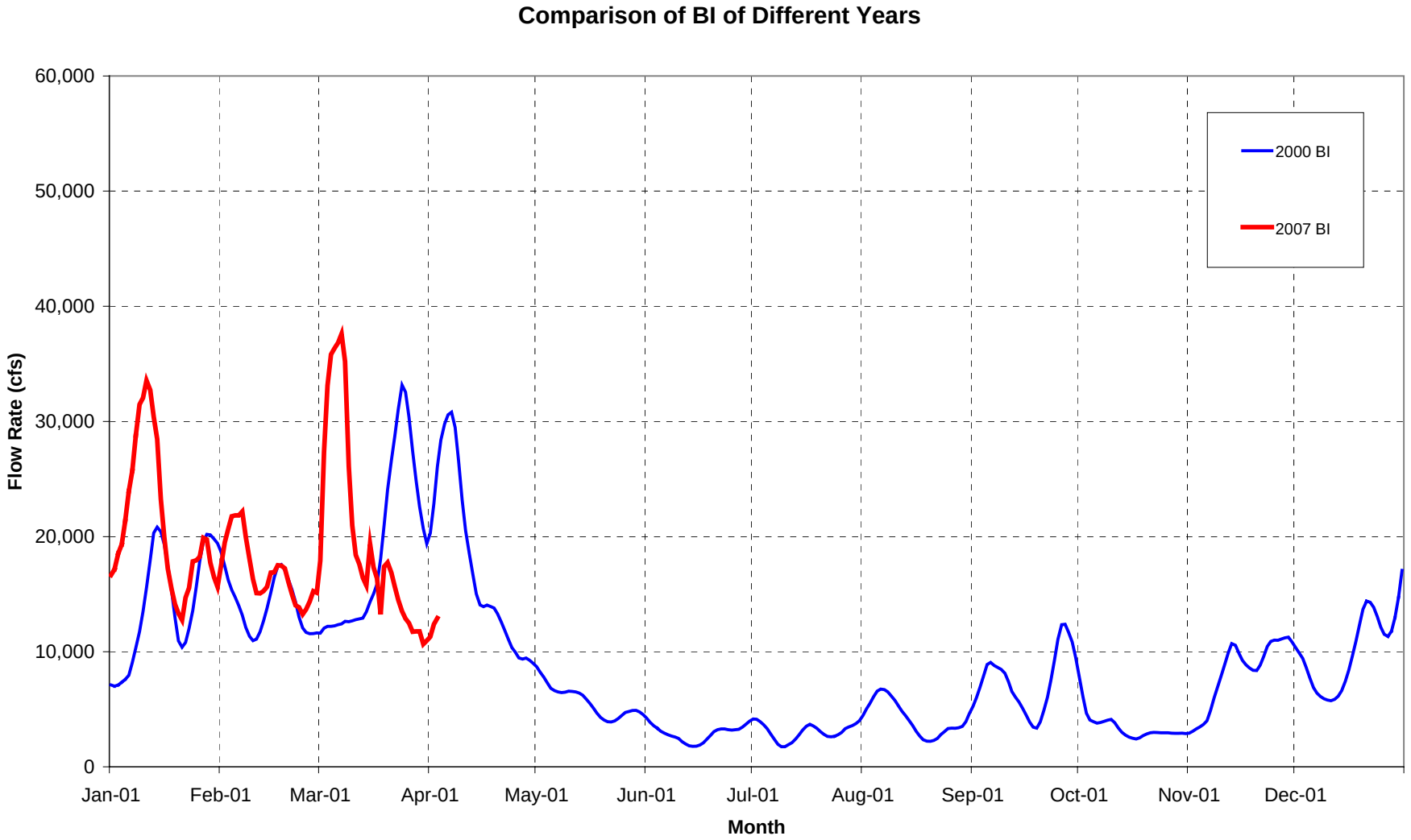

Fig. 5 Comparison of 2007 Basin Inflow to 2000 BI

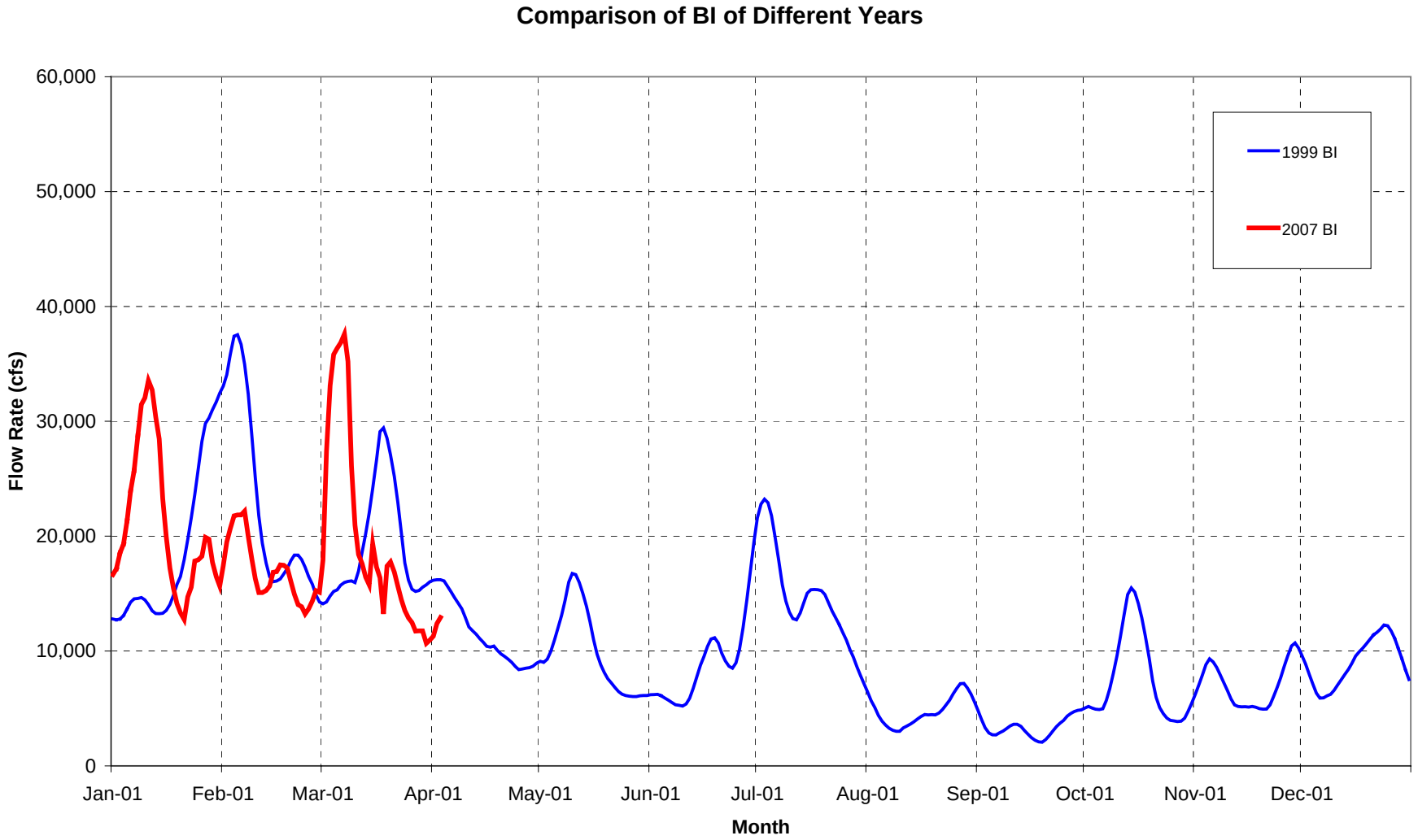

Fig. 6 Comparison of 2007 Basin Inflow to 1999 BI

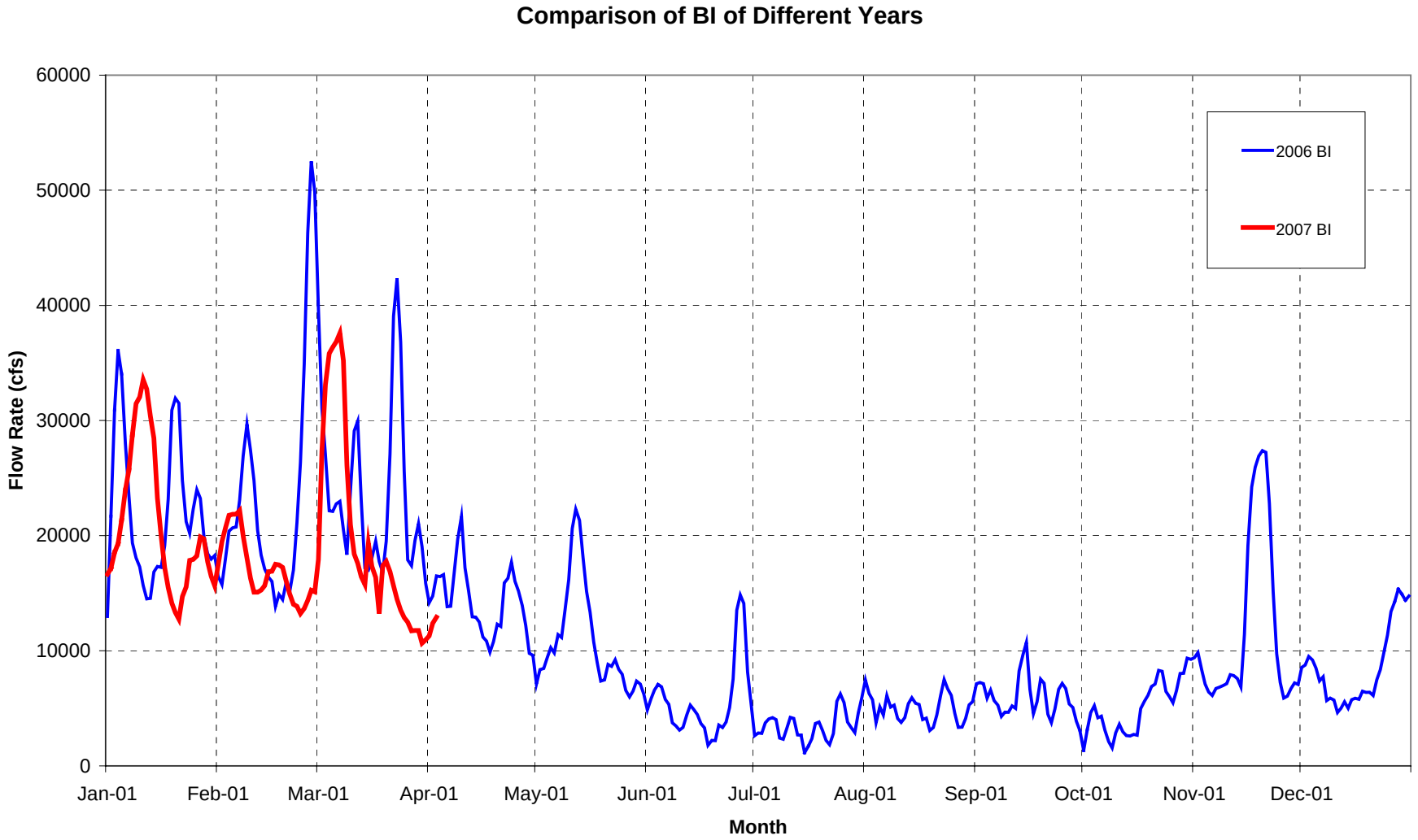

Fig. 7 Comparison of 2007 Basin Inflow to 2006 BI

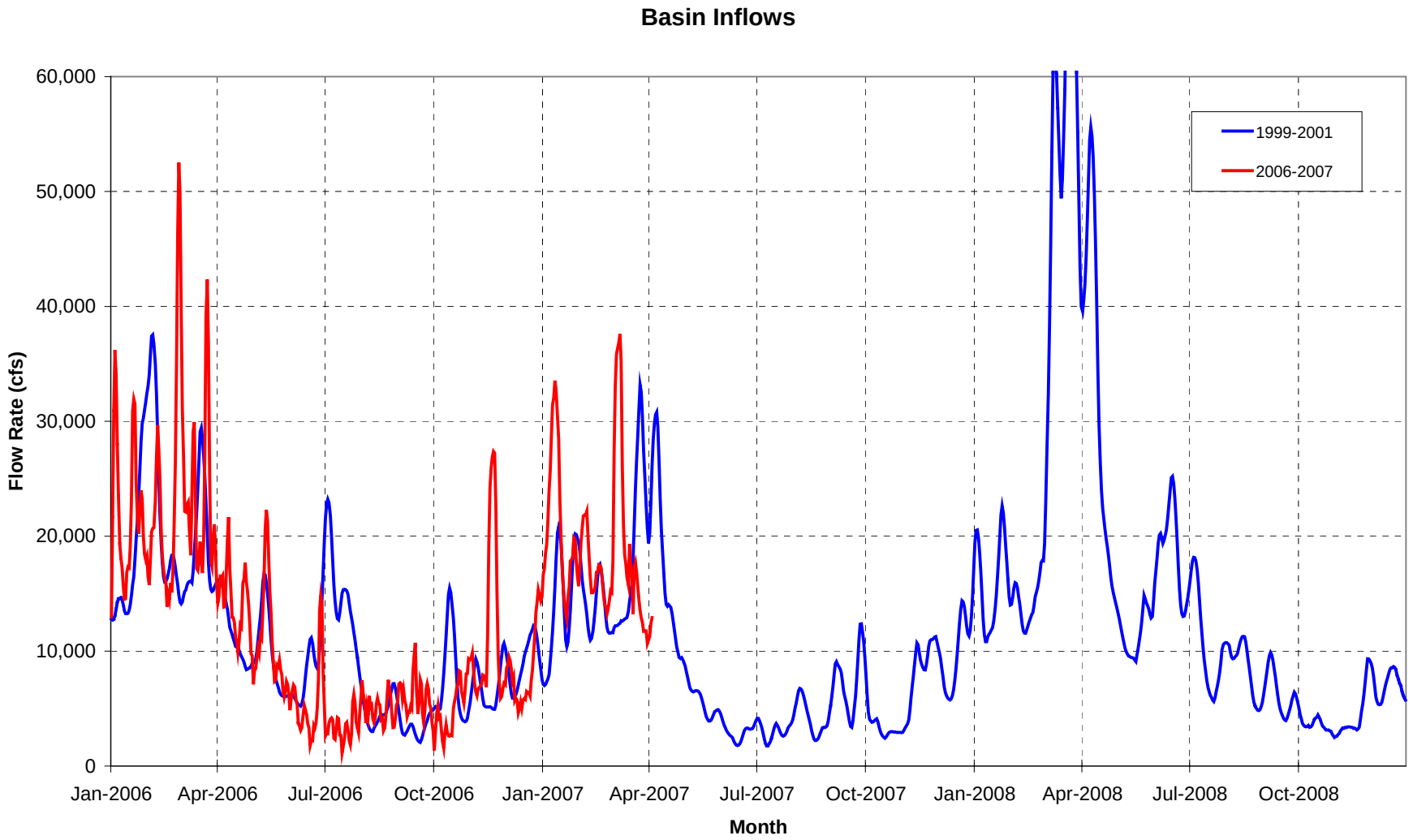

Fig. 8 Comparison of 2006-2007 Basin Inflow to 1999-2001 BI

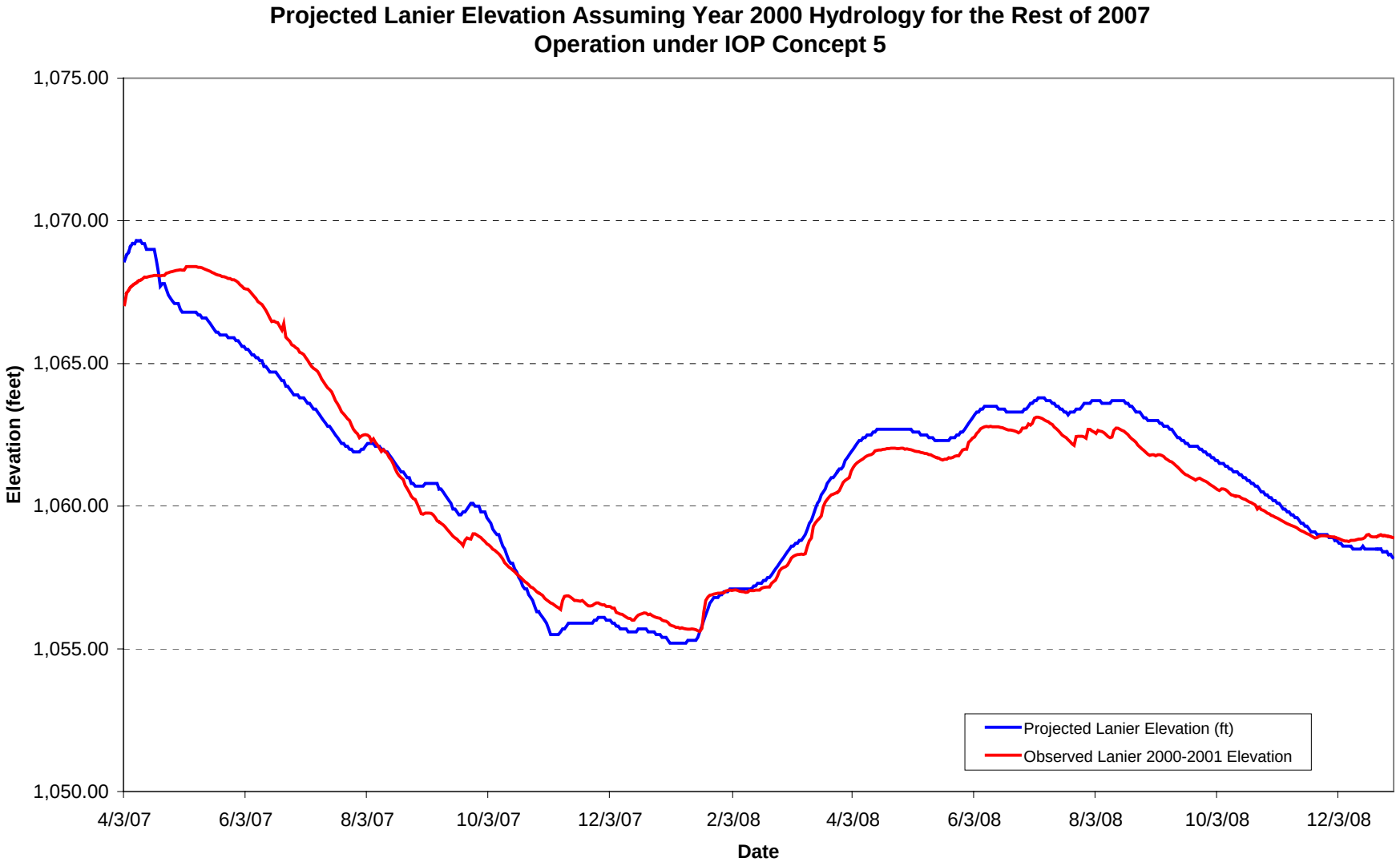

Fig. 9 Comparison of projected and observed (in 2000 through 2001) Lanier elevations

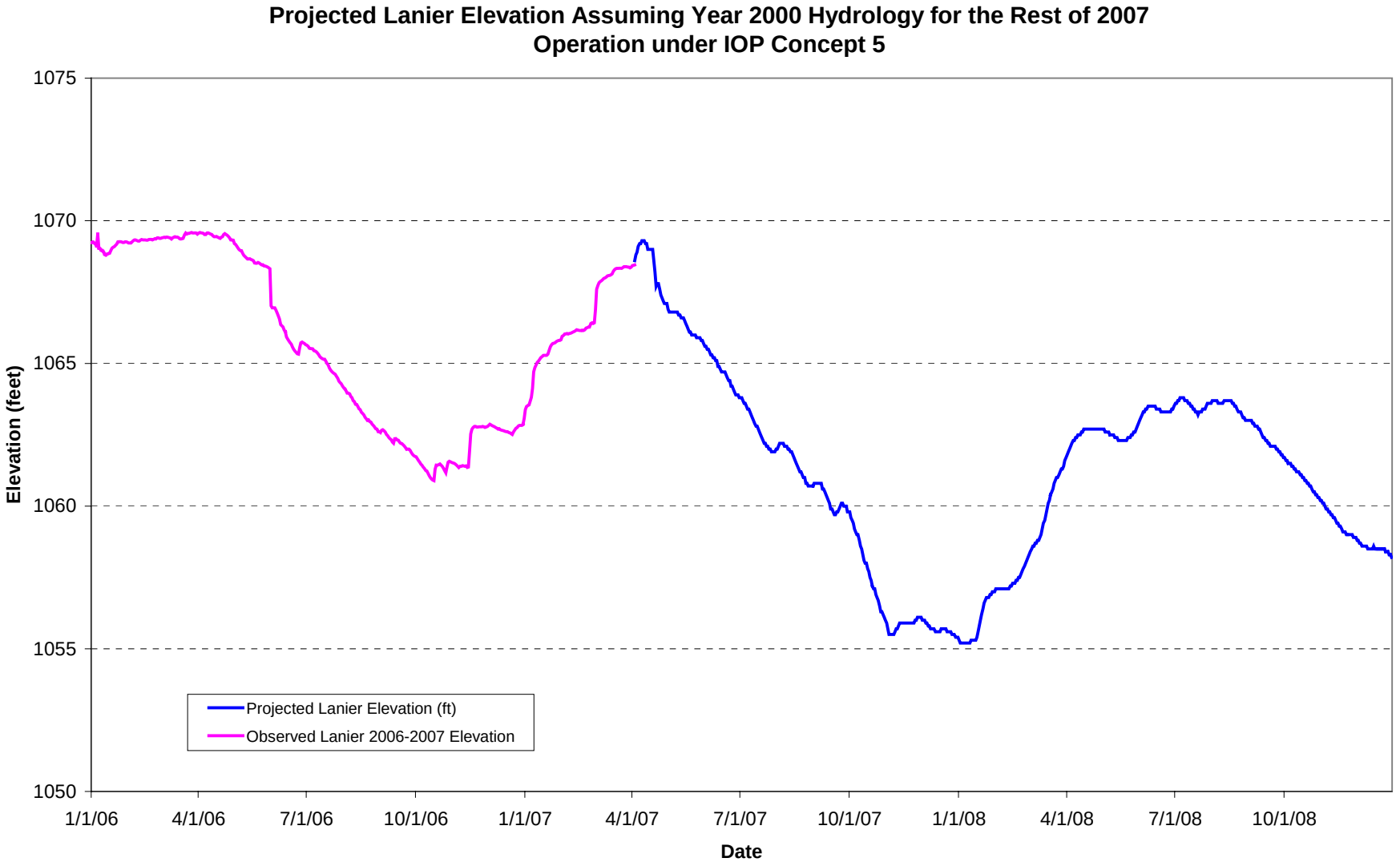

Fig. 10 Observed 2006-2007 Lanier elevation and projected Lanier elevation for the rest of 2007 and 2008

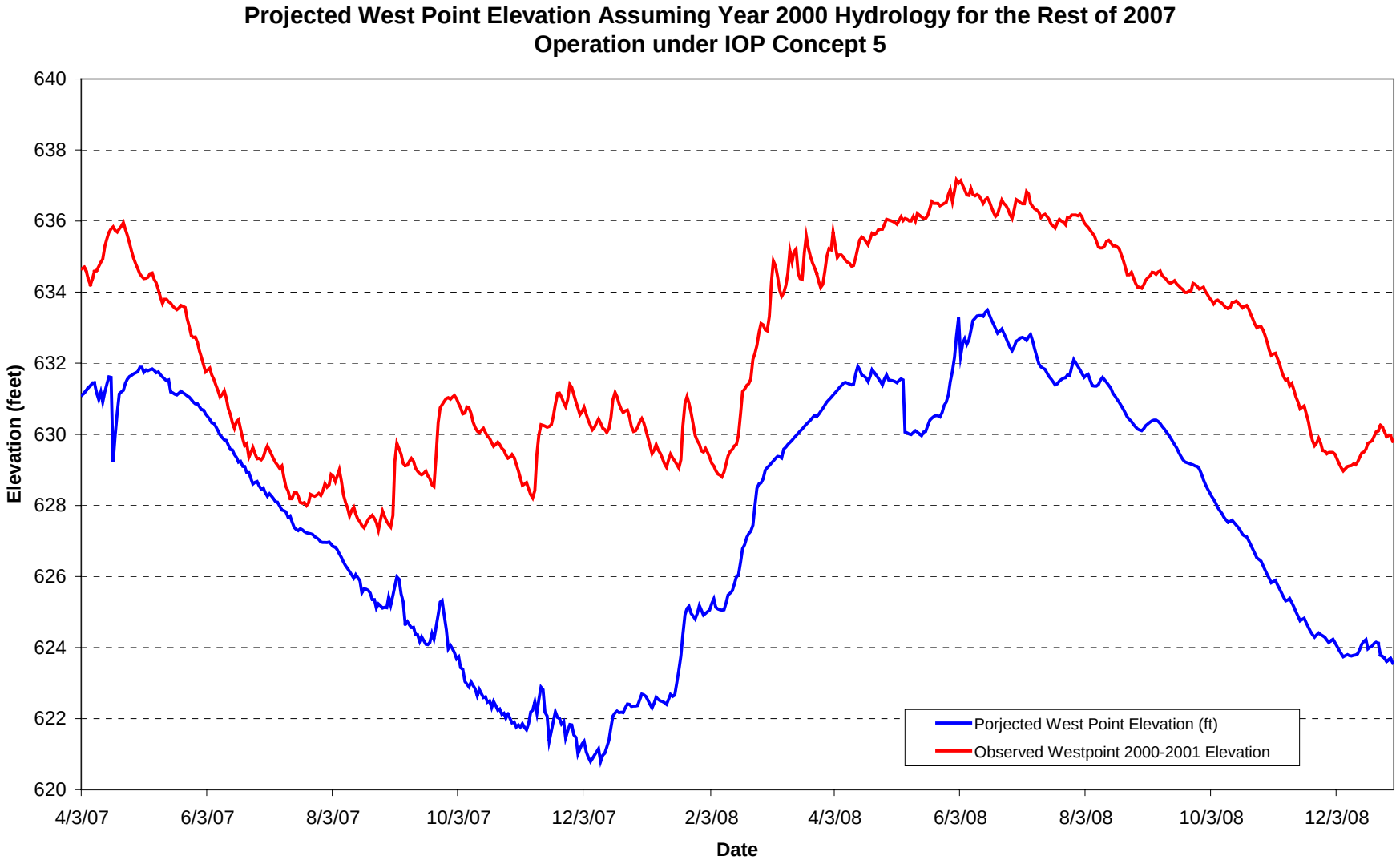

Fig. 11 Comparison of projected and observed (in 2000 through 2001) West Point elevations

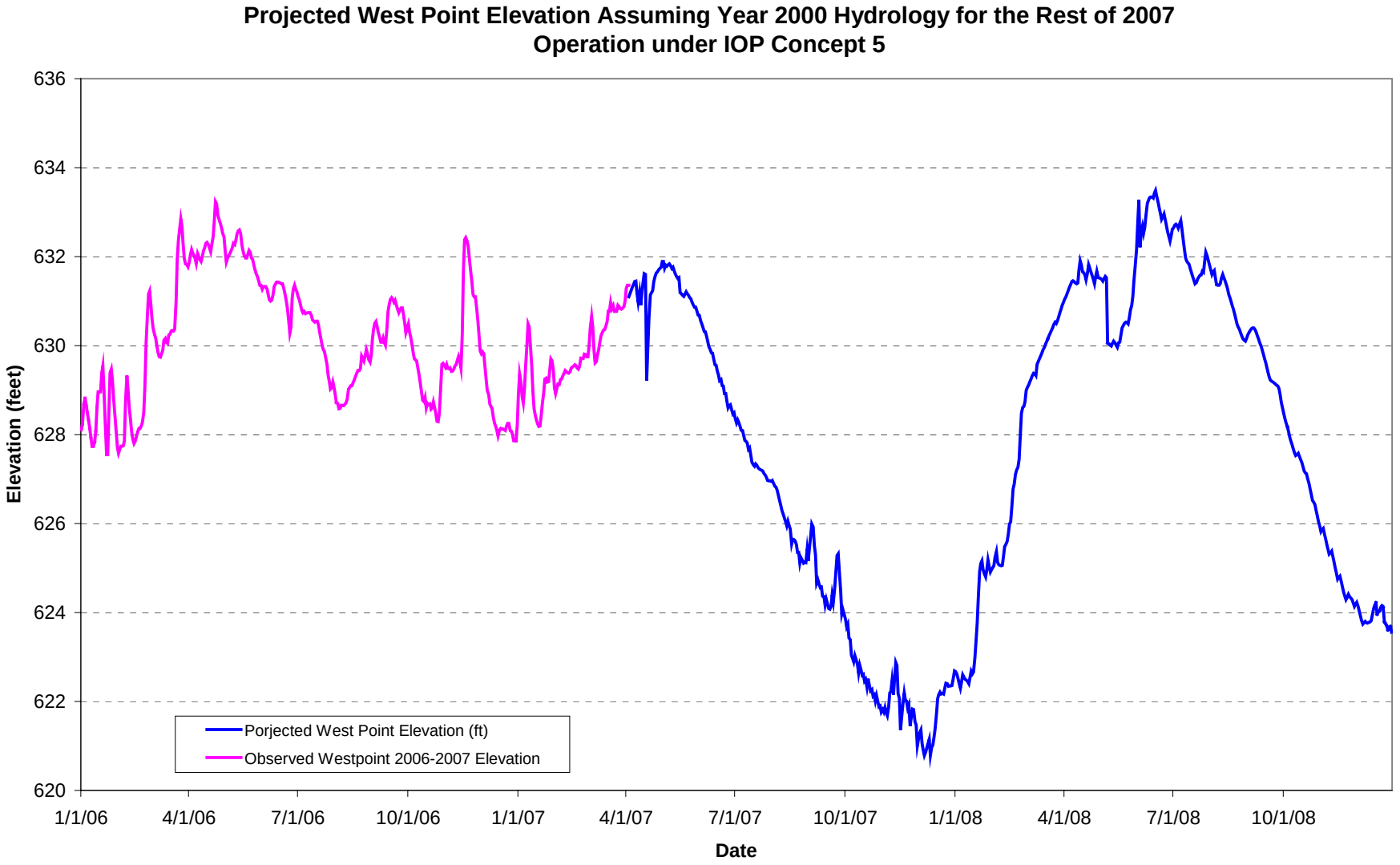

Fig. 12 Observed 2006-2007 West Point elevation and projected West Point elevation for the rest of 2007 and 2008

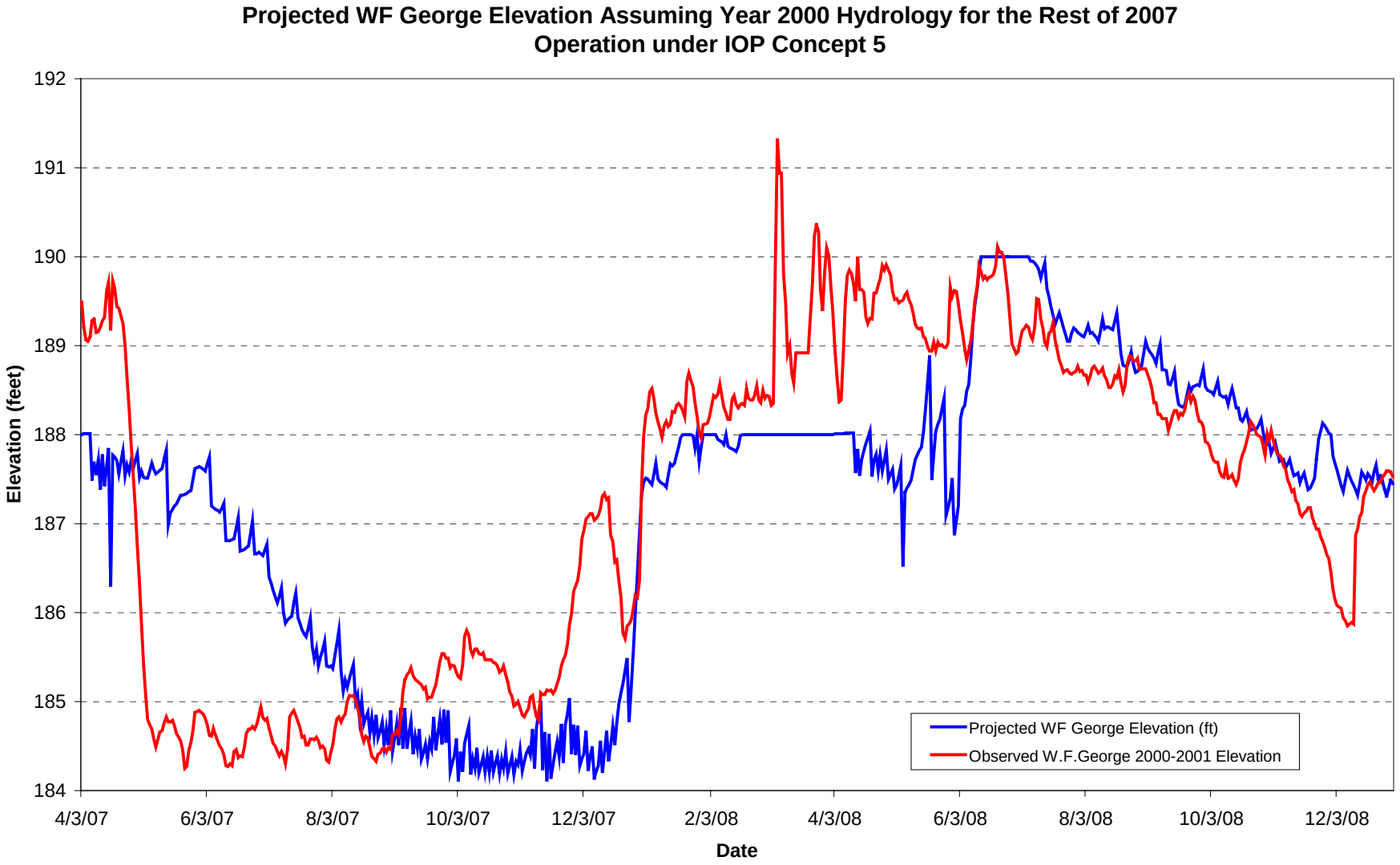

Fig. 13 Comparison of projected and observed (in 2000 through 2001) Walter F. George elevations

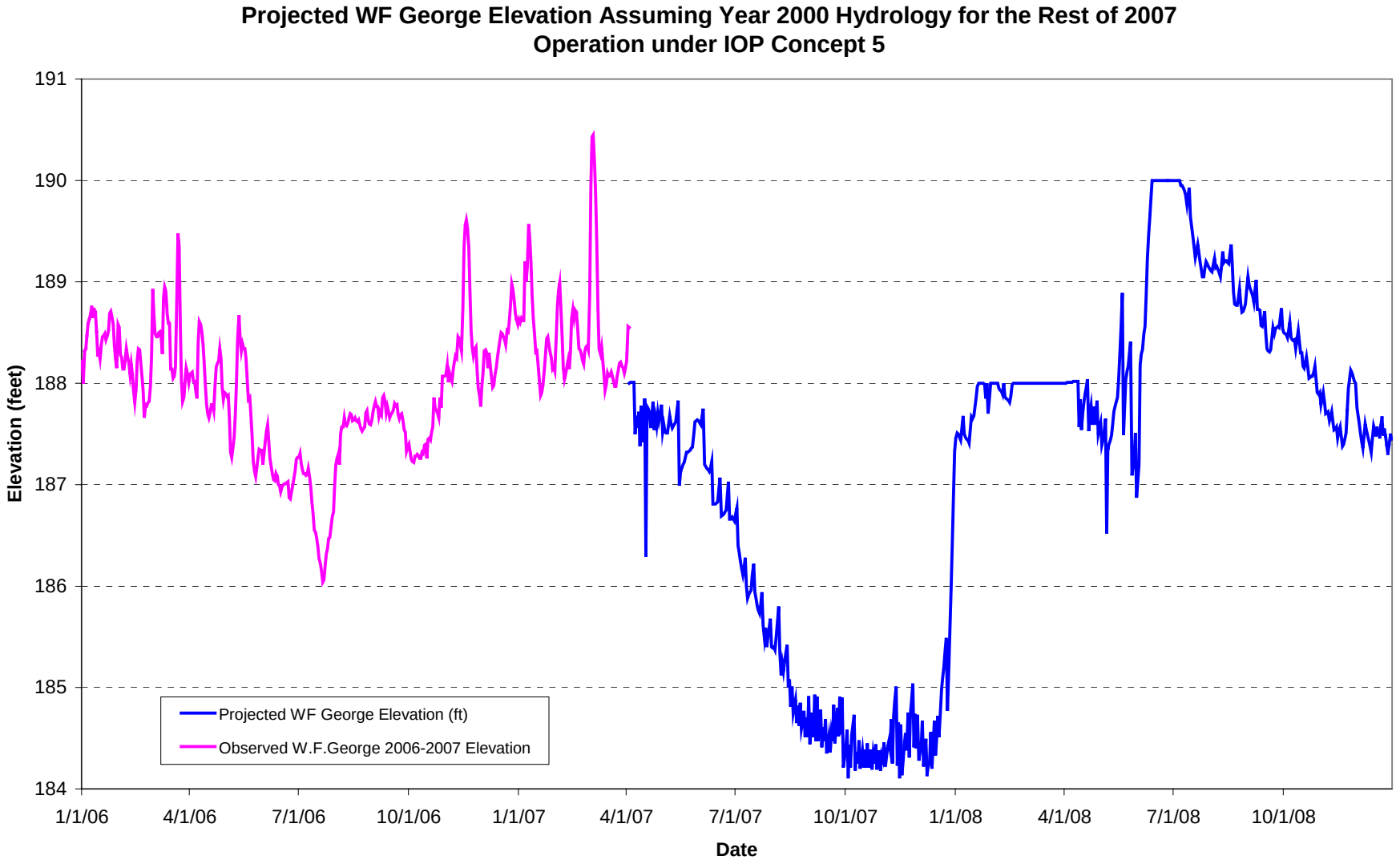

Fig. 14 Observed 2006-2007 Walter F. George elevation and projected Walter F. George elevation for the rest of 2007 and 2008

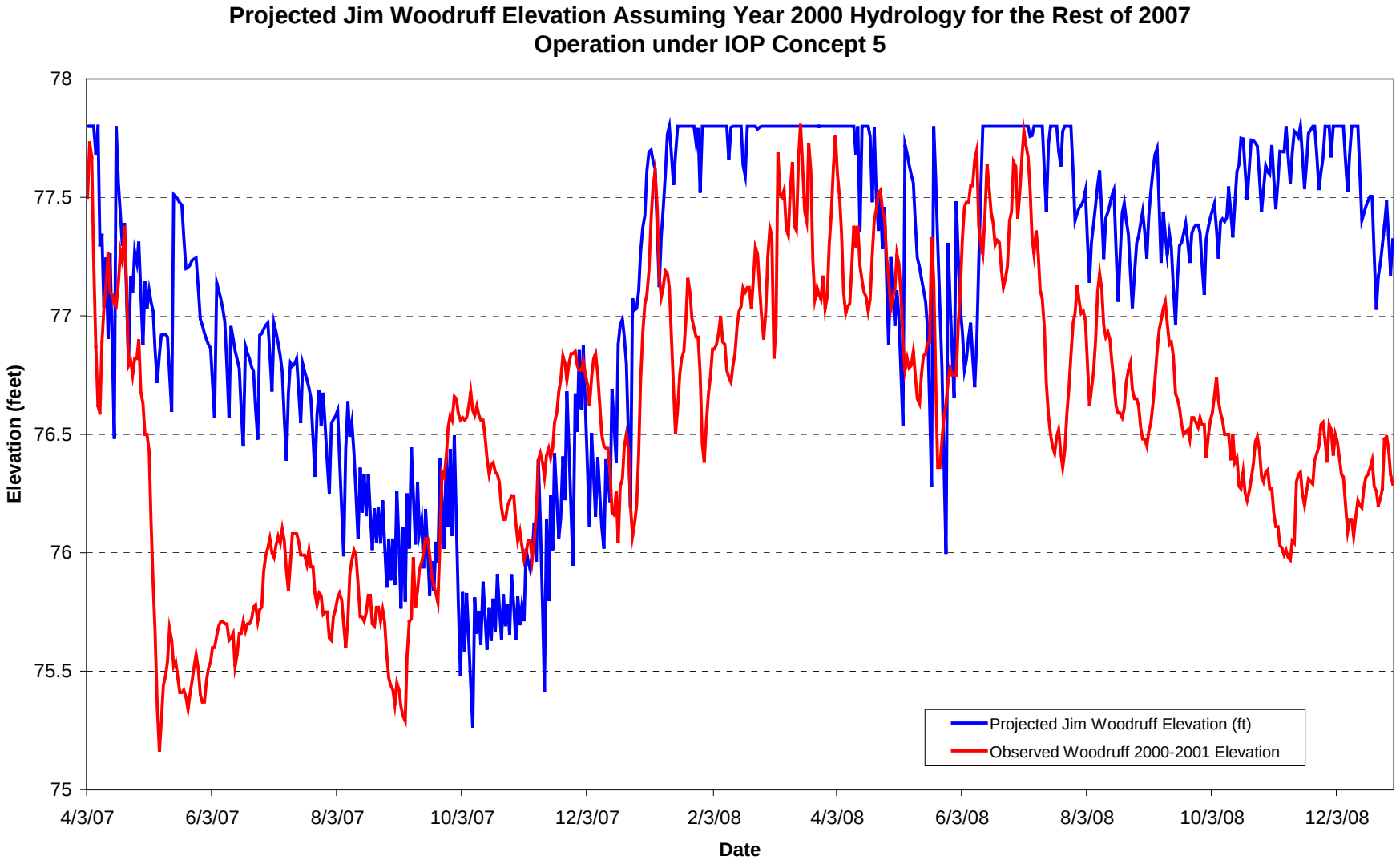

Fig. 15 Comparison of projected and observed (in 2000 through 2001) Jim Woodruff elevations

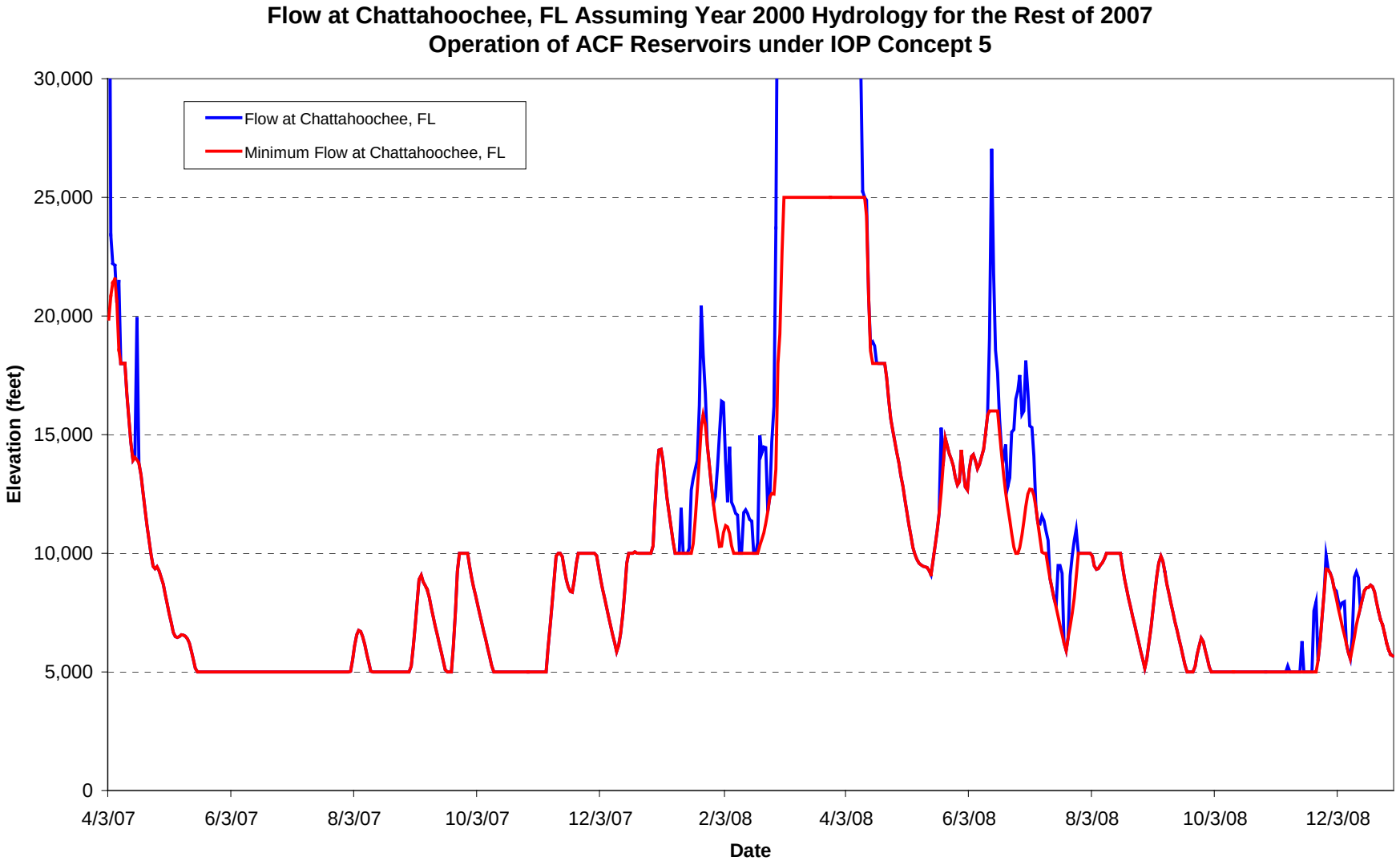

Fig. 16 Simulated Jim Woodruff release and minimum flow requirement under IOP Concept 5