PREPARATION OF THE INTERIM OPERATIONS MODEL IN STELLA

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Damayan Water Project

The program used to simulate the interim operations was STELLA. I used "Florida's" version of this model, the version which I developed and which was used during the Comprehensive Study and modified during the Allocation Formula negotiations.

This is essentially the same version of the model which was reviewed extensively by modeling teams of the three states many years ago when we were attempting to negotiate an Allocation Formula

My work on this project was funded through a non-profit organization and at this time I am neither under contract with the State of Florida or the U.S. Fish and Wildlife Service.

I am going to review the basic input settings for the model and Jerry Ziewitz, USFWS will then review how the model was modified to represent the proposed interim operations.

I am also willing to share with anyone a set of Excel spreadsheets I use to both summarize the input settings of a model run and to analyze model output.

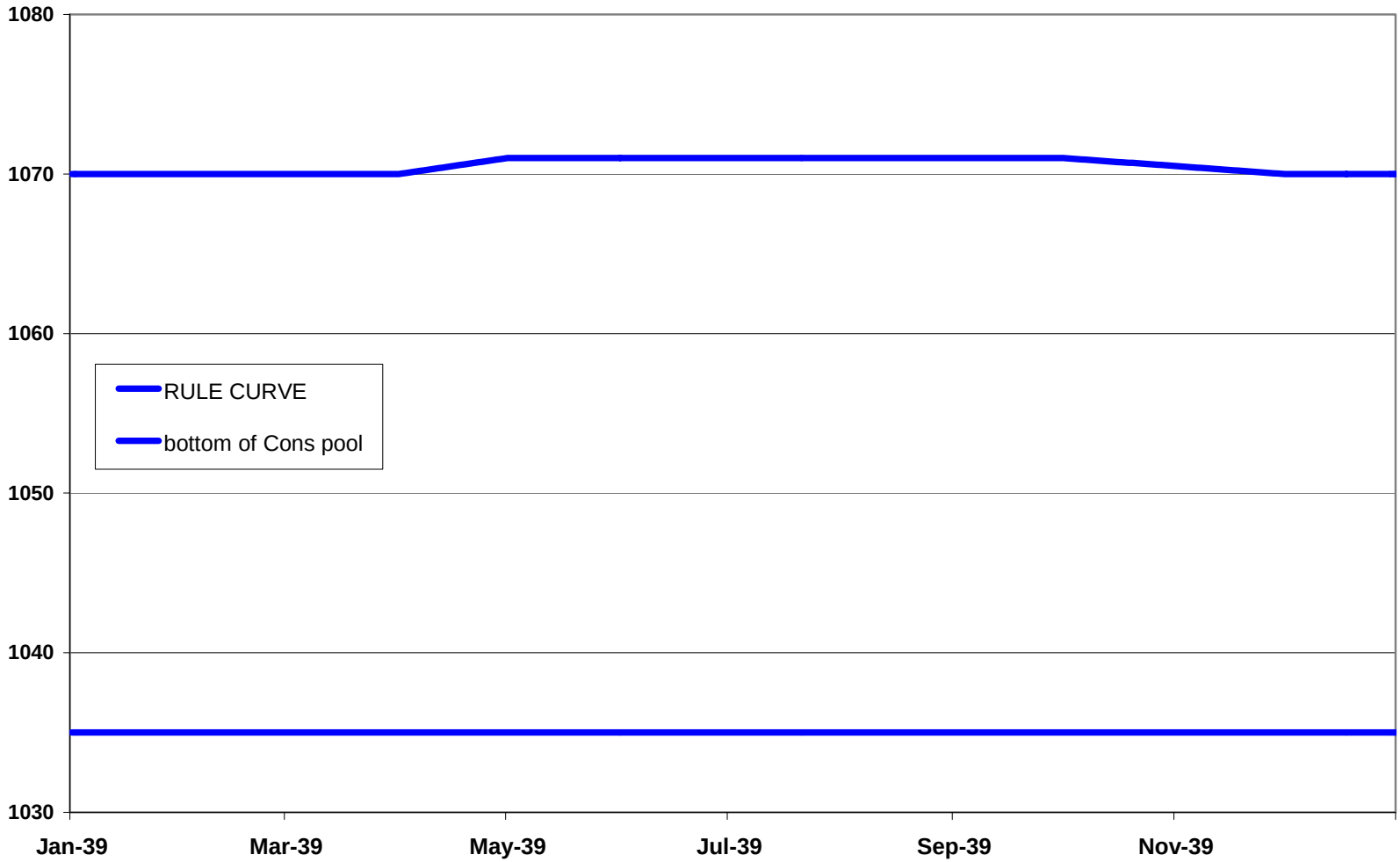
Copies of the model can be provided to anyone requesting them, although you must have your own version of STELLA to view the model.

At the root of the model is the same unimpaired flow set developed by the Corps of Engineers and the three states, which is the identical unimpaired flow set used in HEC-5.

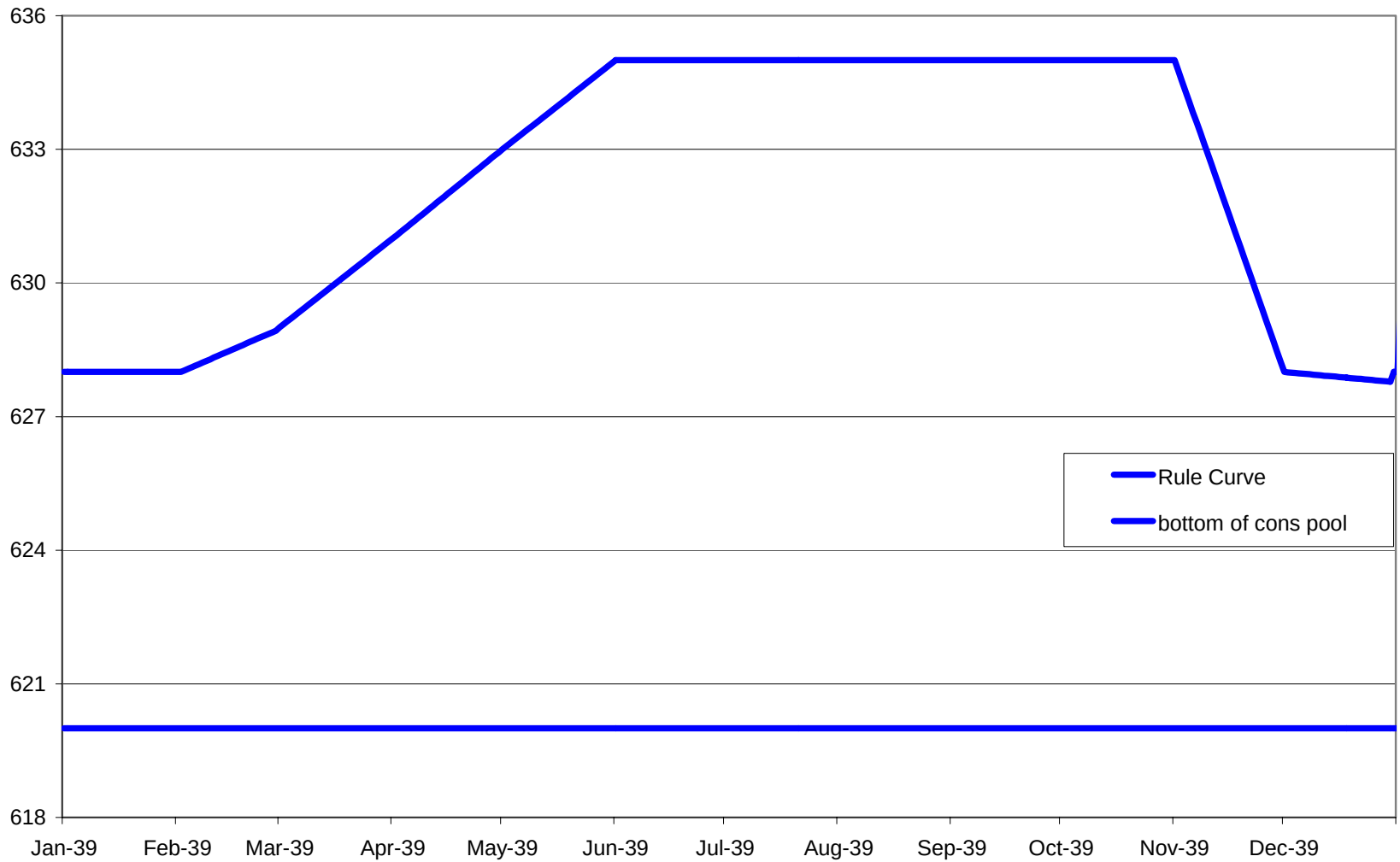
The basic reservoir operations in the model is a rule curve approach to operations. In other words, the zone approach, which is included in the current water control plan, is not followed.

The one exception to this approach is hydropower, for which releases are made consistent with the requirements of the Water Control Plan at the same zone levels and hours of release called for by the WCP.

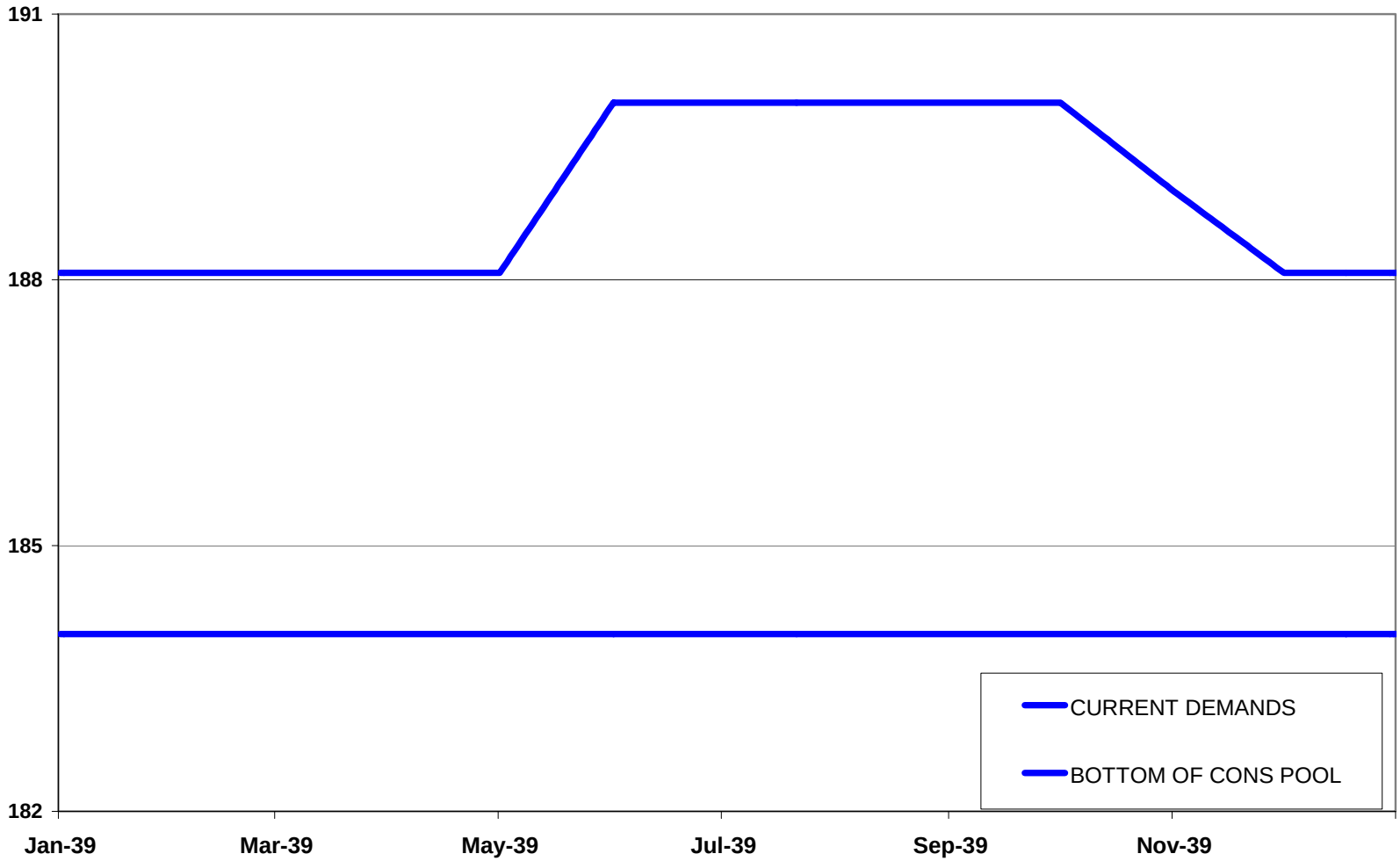
LAKE LANIER: RULE CURVE AND BOTTOM OF CONSERVATION POOL



RULE CURVE ELEVATIONS AT WEST POINT RESERVOIR



RULE CURVE ELEVATIONS AT GEORGE



No specific releases are made to support the federal navigation project.

The demand set used in the model evaluations is the 2000 forecasted demands with releases for the metro Atlanta region modified to represent the averages of what occurred between 1998 and 2001.

withdrawal

	BUFORD	PTC	W'BURG	TOTAL
Jan	98.6	294.2	25.9	418.7
Feb	94.9	290.8	26.0	411.7
March	104.0	292.1	27.0	423.1
April	119.1	312.0	28.6	459.7
May	134.7	360.5	29.9	525.1
June	133.8	363.9	29.3	527.0
July	139.9	382.8	28.2	550.9
August	141.2	374.5	30.1	545.8
Sept	139.6	347.6	29.6	516.8
Oct	125.4	334.2	28.1	487.7
Nov	116.3	314.9	27.6	458.8
Dec	105.2	293.9	26.5	425.6
annual avg	121.1	330.1	28.1	479.2

return

	BUFORD	PTC	W'BURG	TOTAL
Jan	12.7	29.9	213.7	256.3
Feb	12.6	29.9	213.1	255.6
March	12.4	29.5	213.0	254.9
April	12.3	29.6	212.4	254.3
May	12.4	28.4	208.6	249.4
June	12.3	28.0	211.4	251.7
July	12.3	28.9	206.7	247.9
August	12.1	29.2	205.4	246.7
Sept	11.7	29.8	209.8	251.3
Oct	11.9	28.6	198.6	239.1
Nov	11.5	29.2	206.4	247.1
Dec	11.3	31.5	202.4	245.2
annual avg	12.1	29.4	208.5	250.0

The acreage value used for Flint agricultural withdrawals was 621,000 acres and the dry year multiplier was set at 1.2. Using these values resulted in flows in the Flint during the 1999-2001 drought that were comparable to gauged flows.

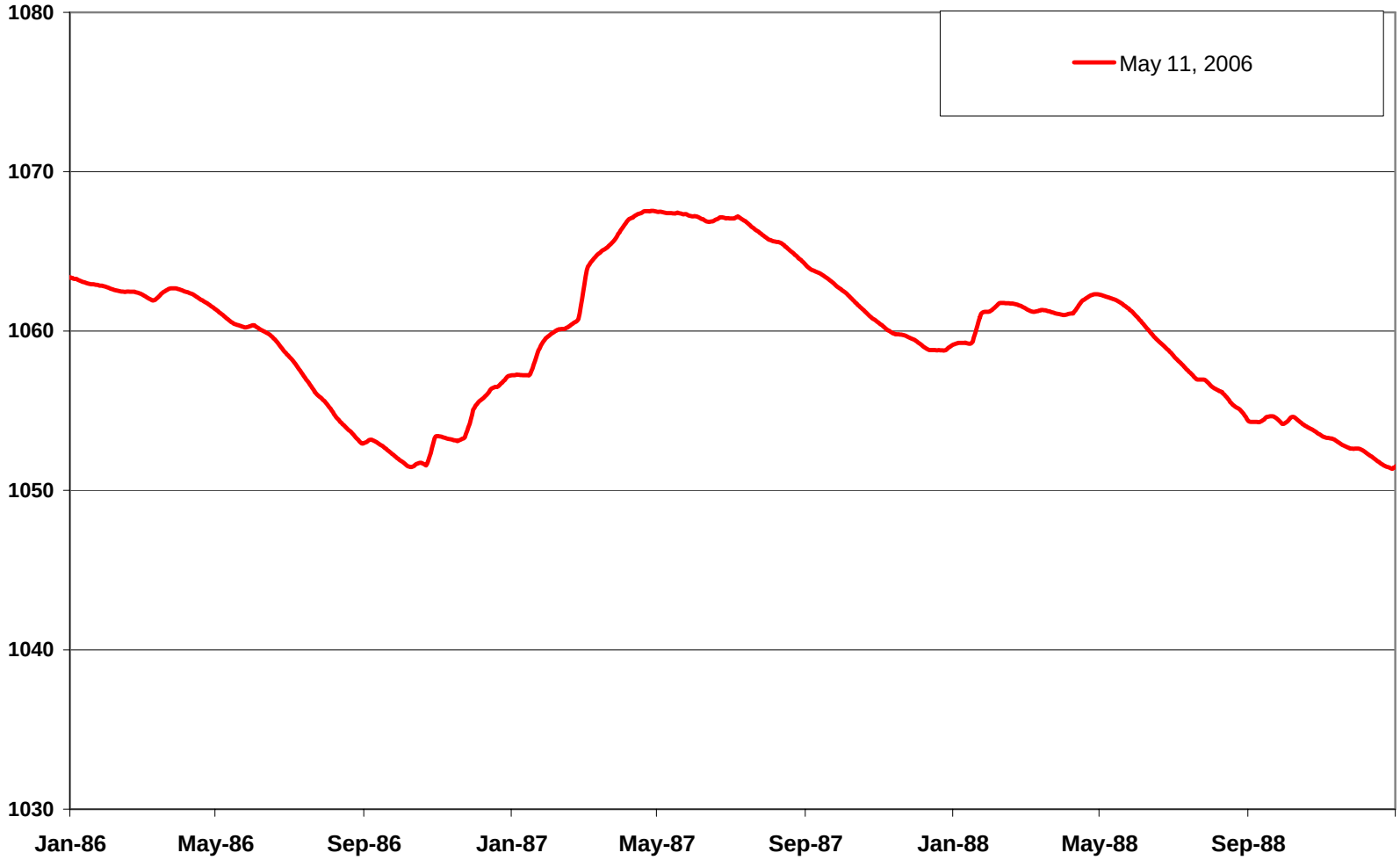
The minimum flow target at Peachtree Creek was set at 750 cfs daily average flow.

SUMMARY OF ACF OUTPUT

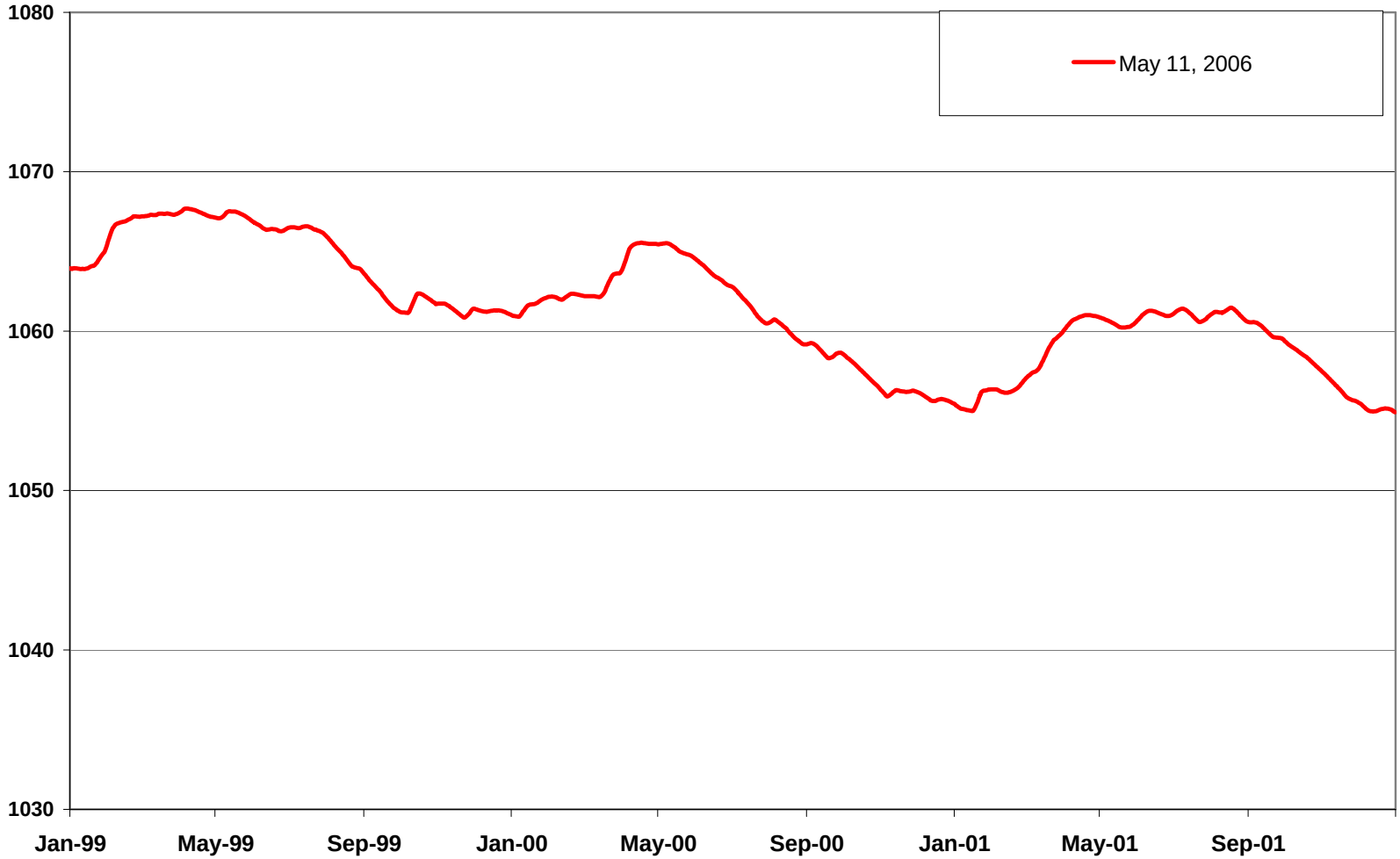
MAY 11, 2006

LANIER

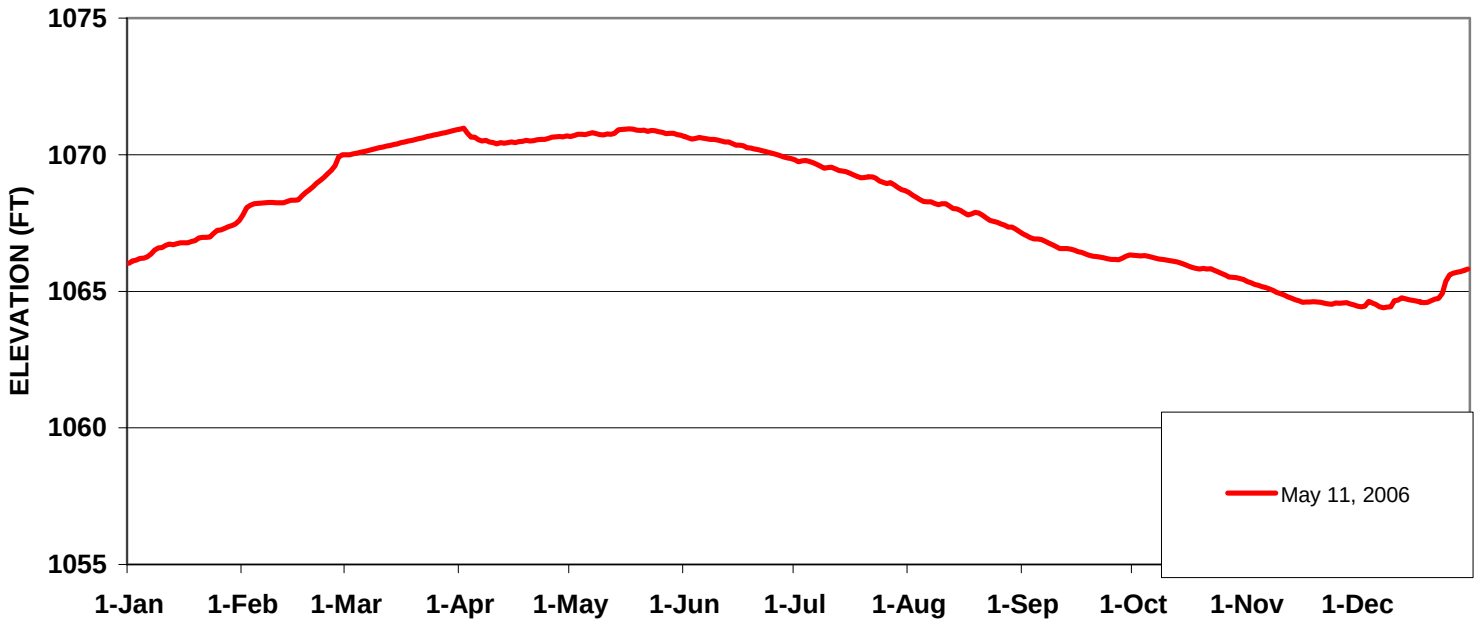
DAILY TIME SERIES OF ELEVATIONS AT LAKE LANIER
1986-1988



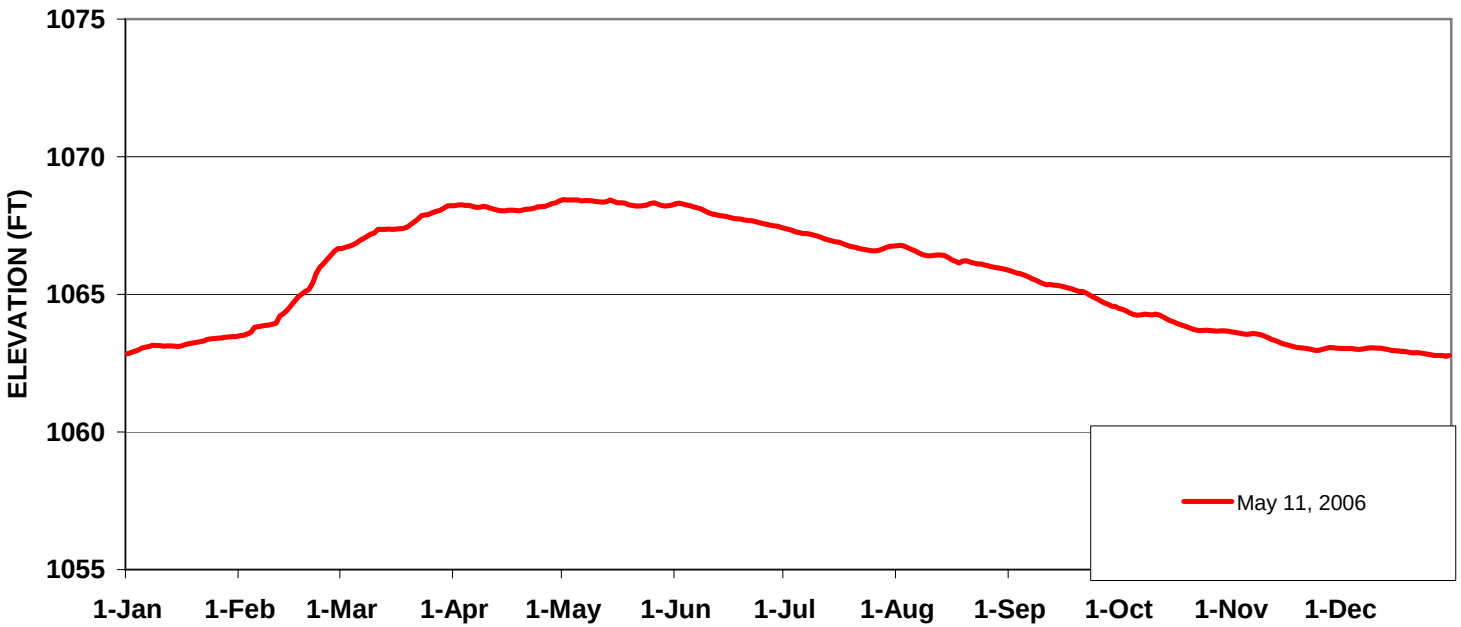
DAILY TIME SERIES OF ELEVATIONS AT LAKE LANIER
1999-2001



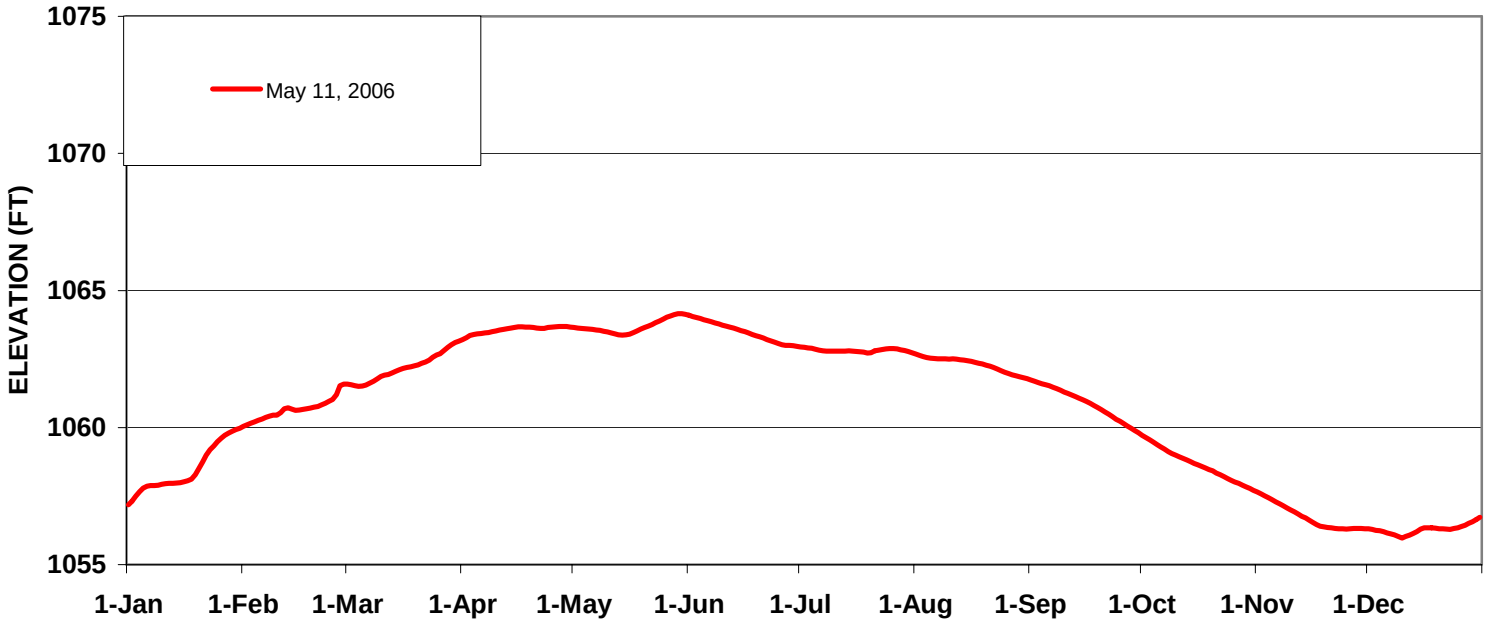
MEDIAN LANIER ELEVATIONS



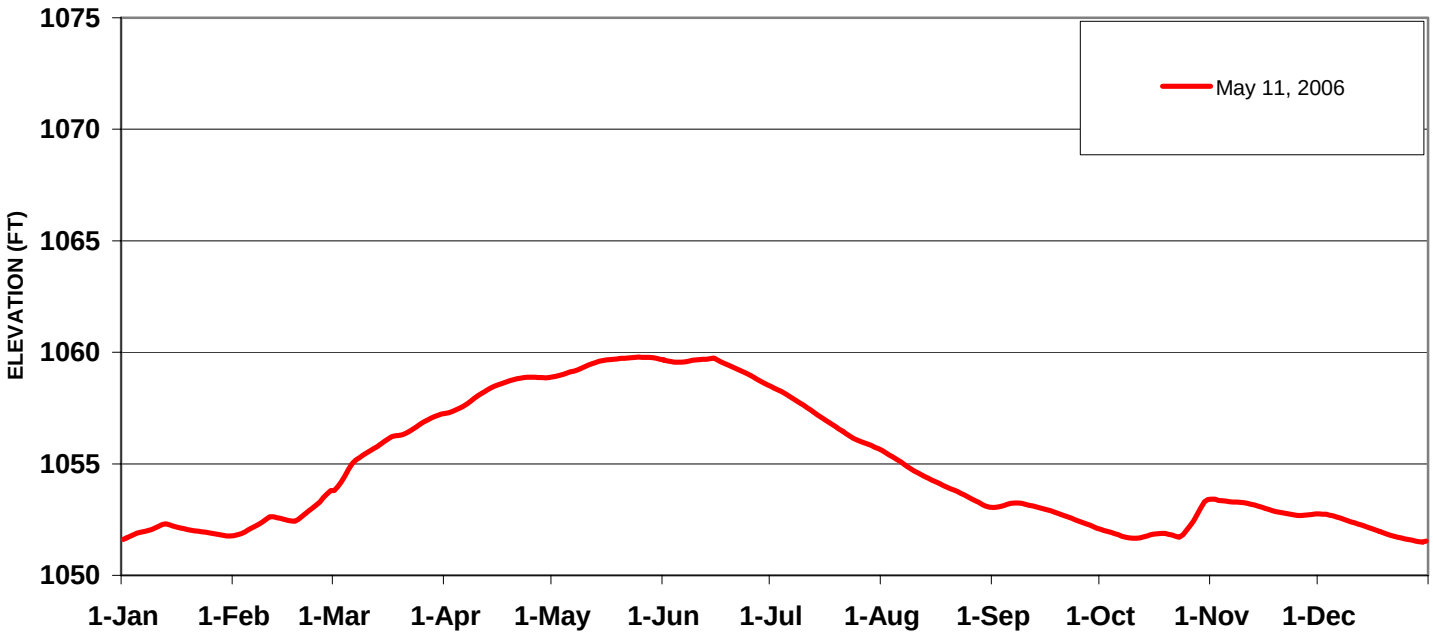
75% EXCEEDED LANIER ELEVATIONS



90% EXCEEDED LANIER ELEVATIONS

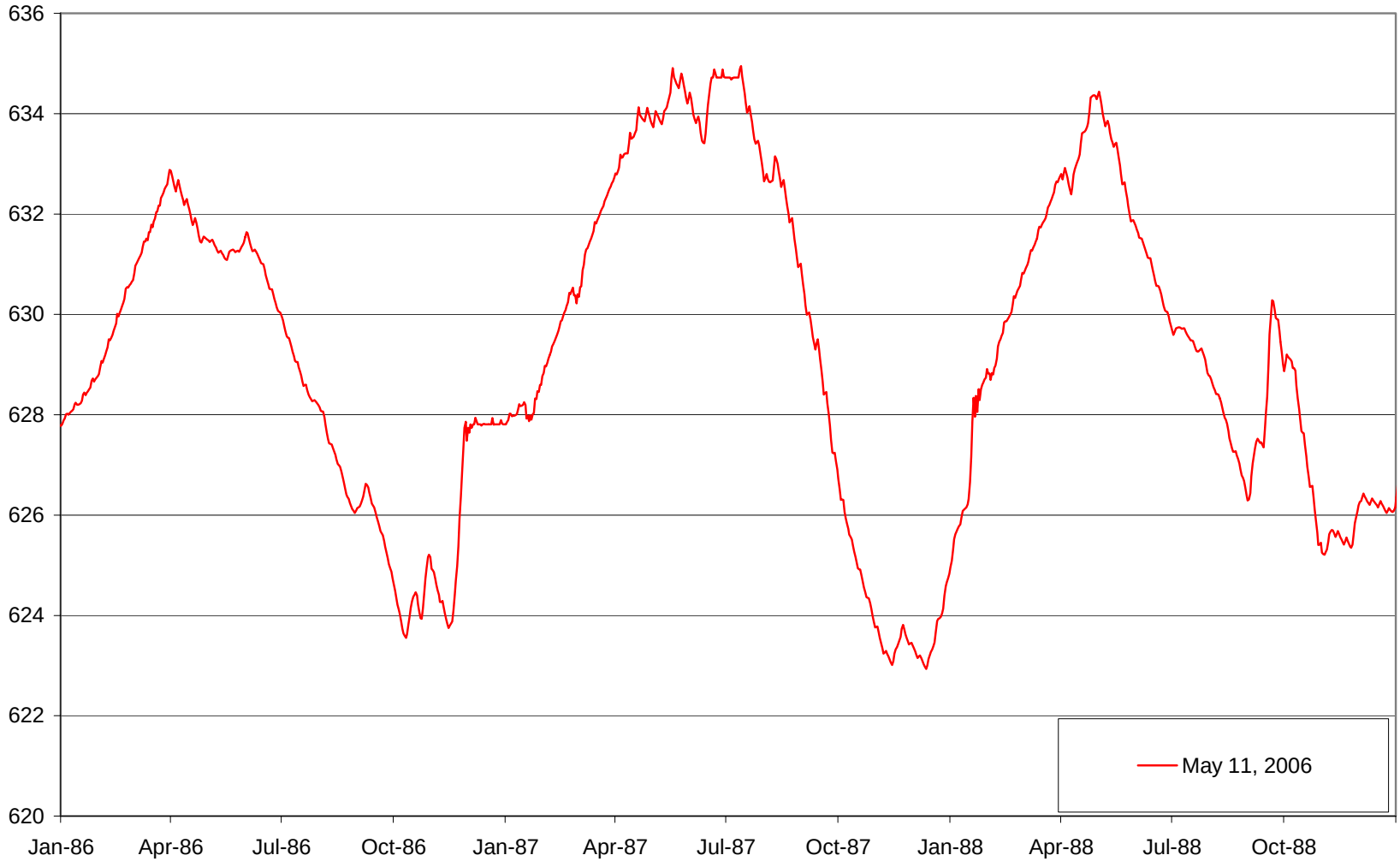


MINIMUM LANIER ELEVATIONS

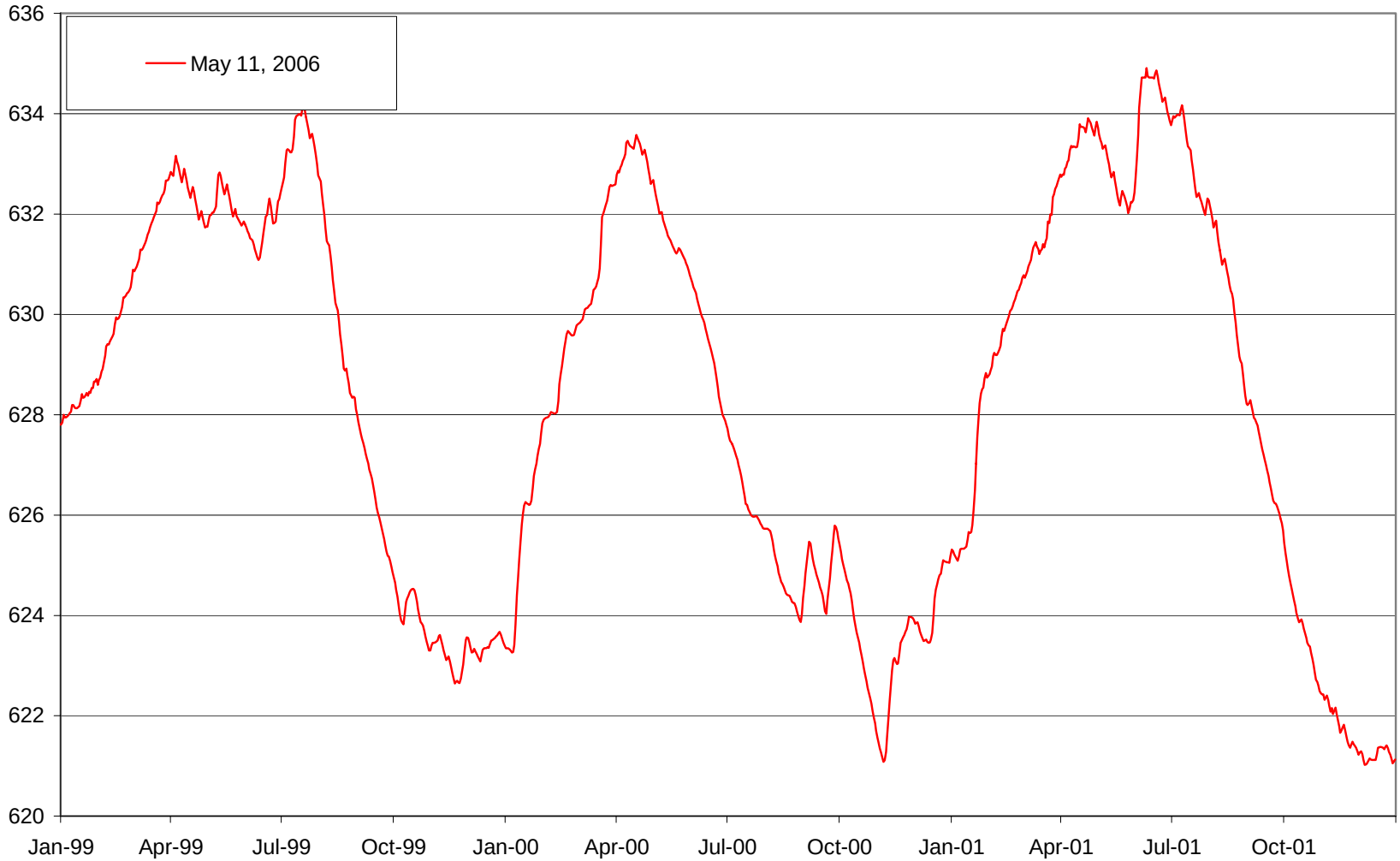


WEST POINT

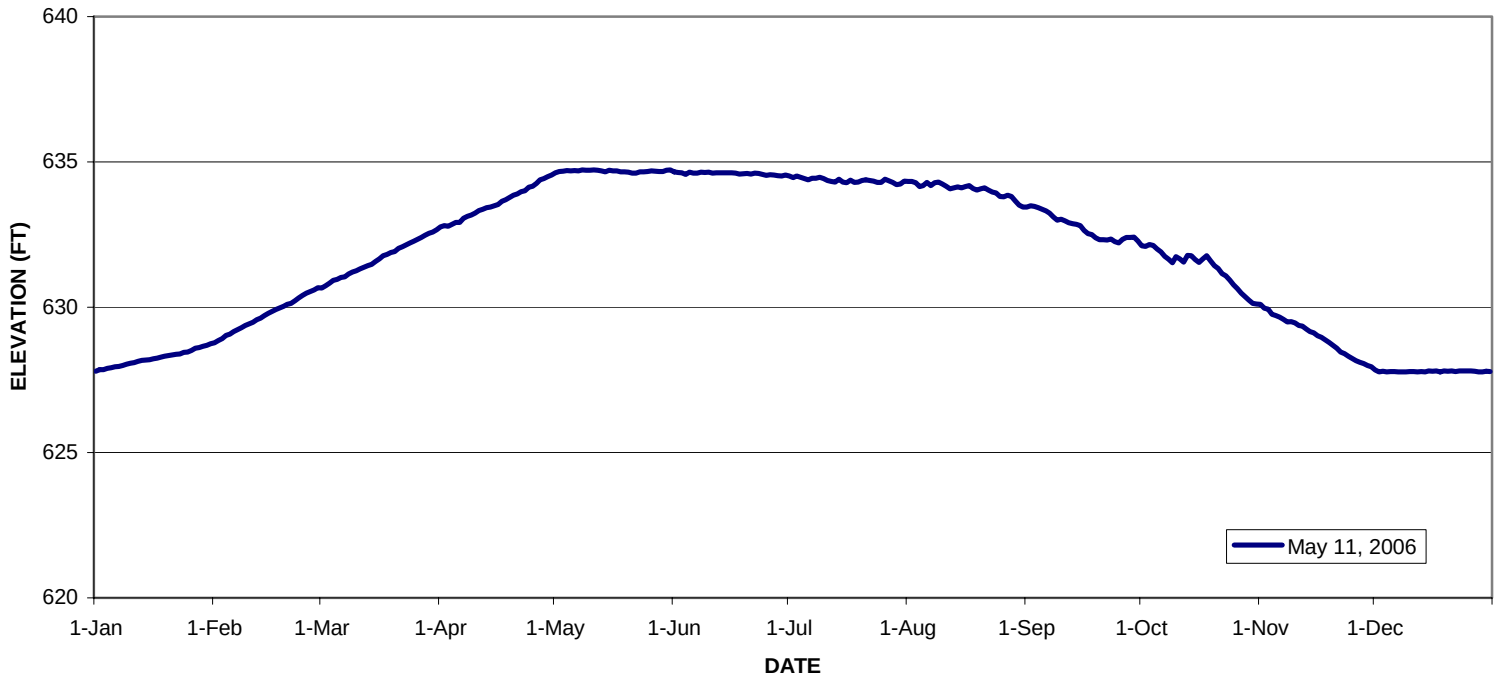
DAILY ELEVATIONS AT WEST POINT RESERVOIR



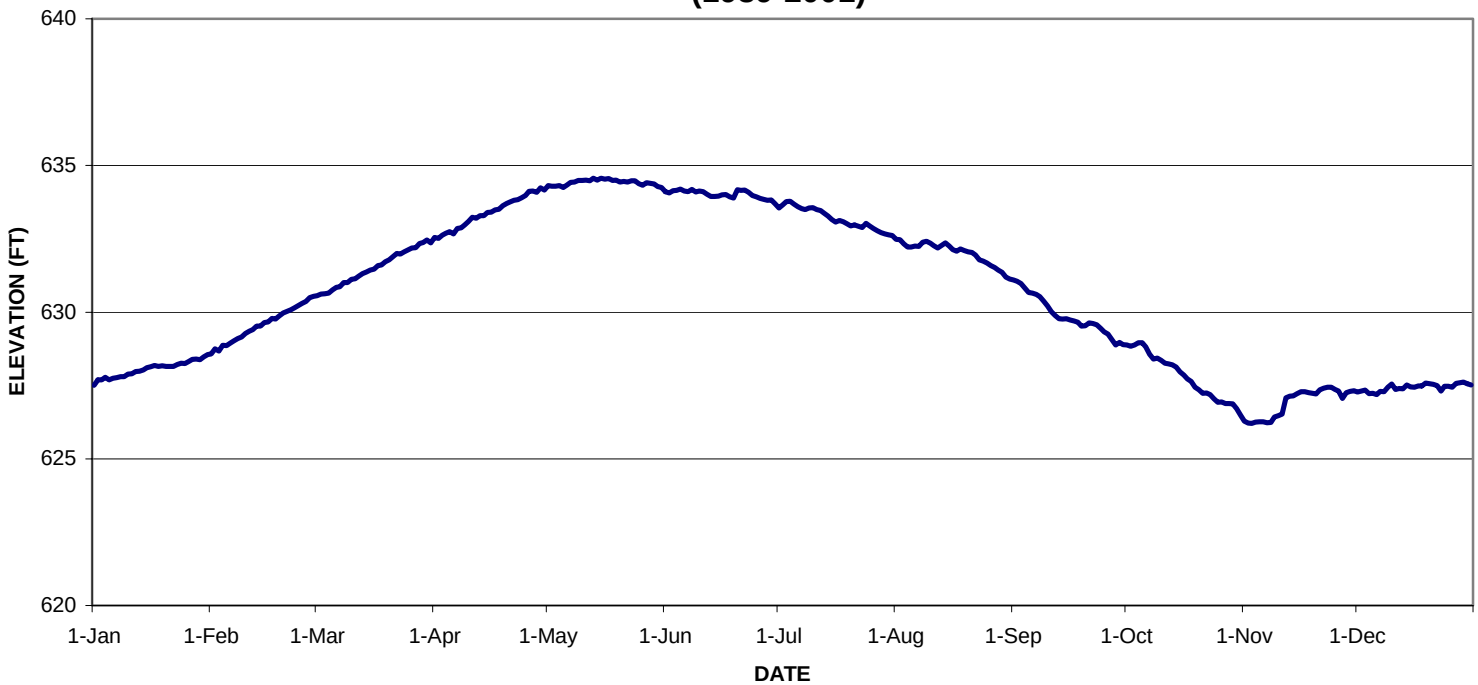
DAILY ELEVATIONS AT WEST POINT RESERVOIR



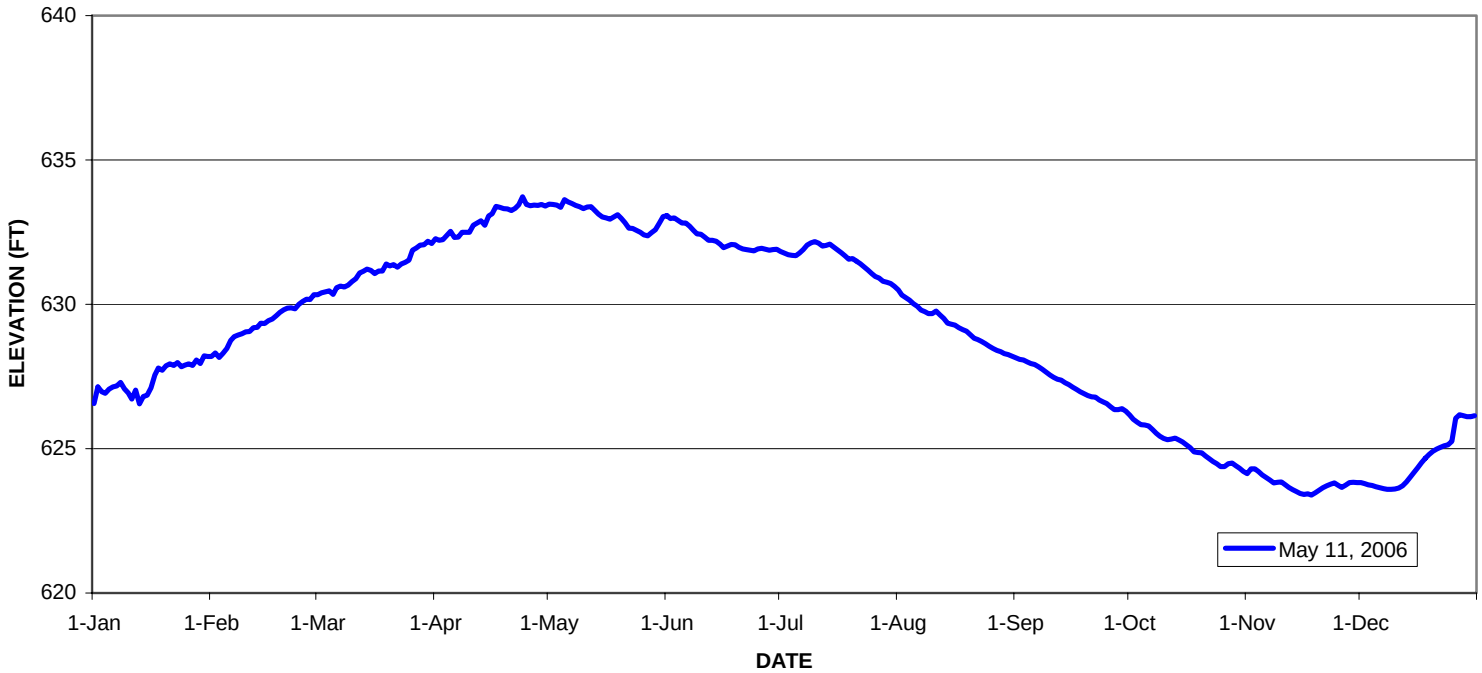
MEDIAN ELEVATION AT WEST POINT LAKE (1939-2001)



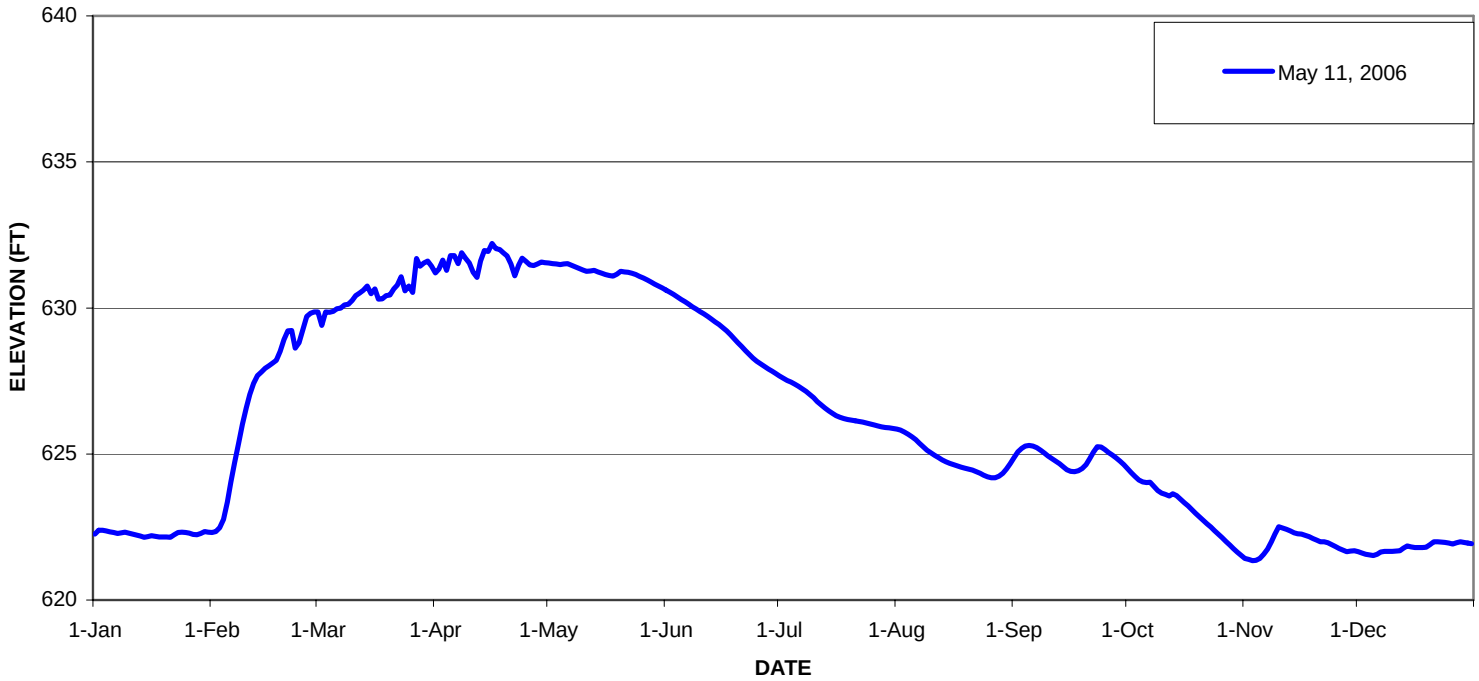
MEDIUM LOW ELEVATIONS (75% EXCEEDED) AT WEST POINT LAKE (1939-2001)



LOW ELEVATIONS (90% EXCEEDED) AT WEST POINT LAKE (1939-2001)

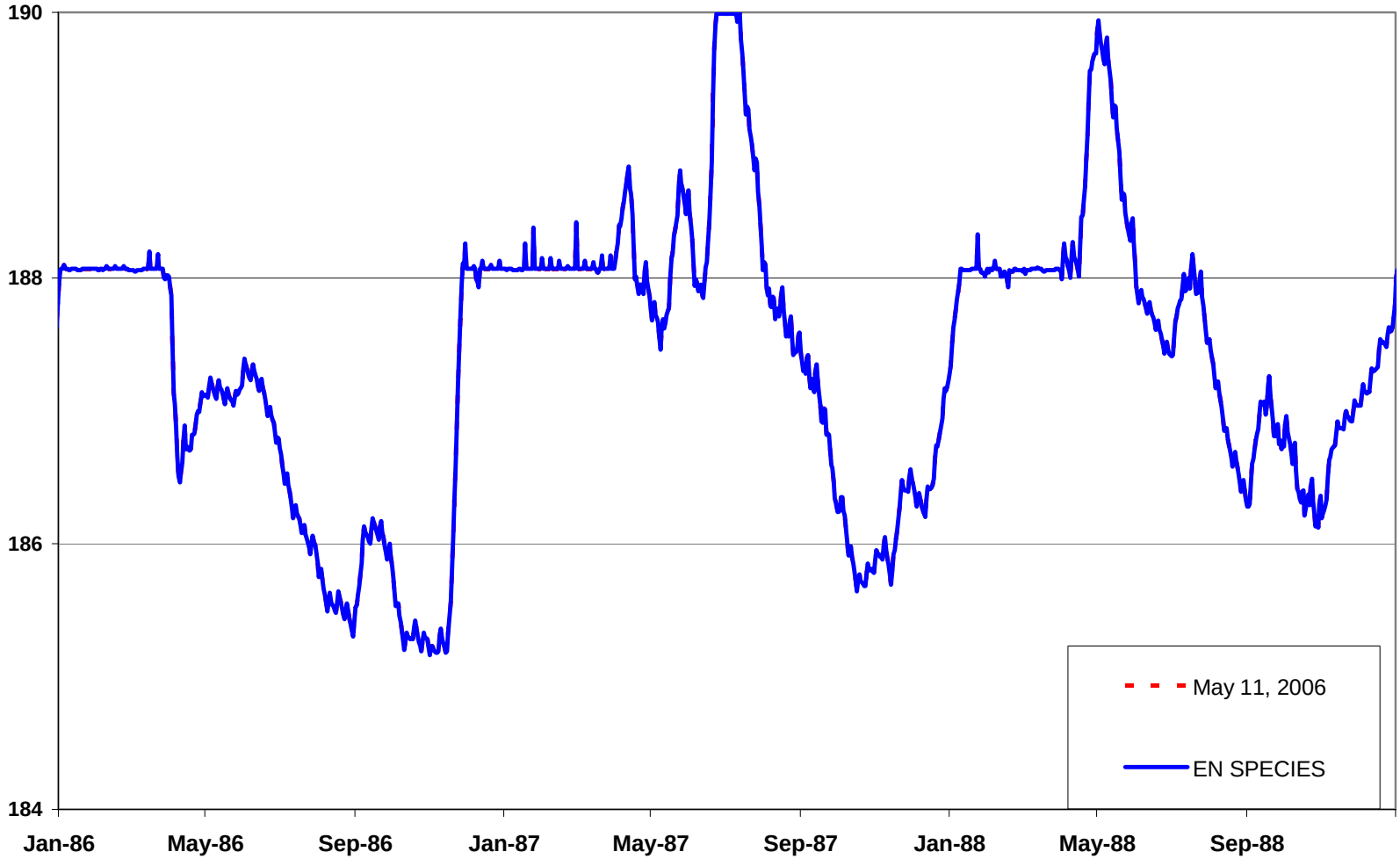


MINIMUM ELEVATIONS AT WEST POINT

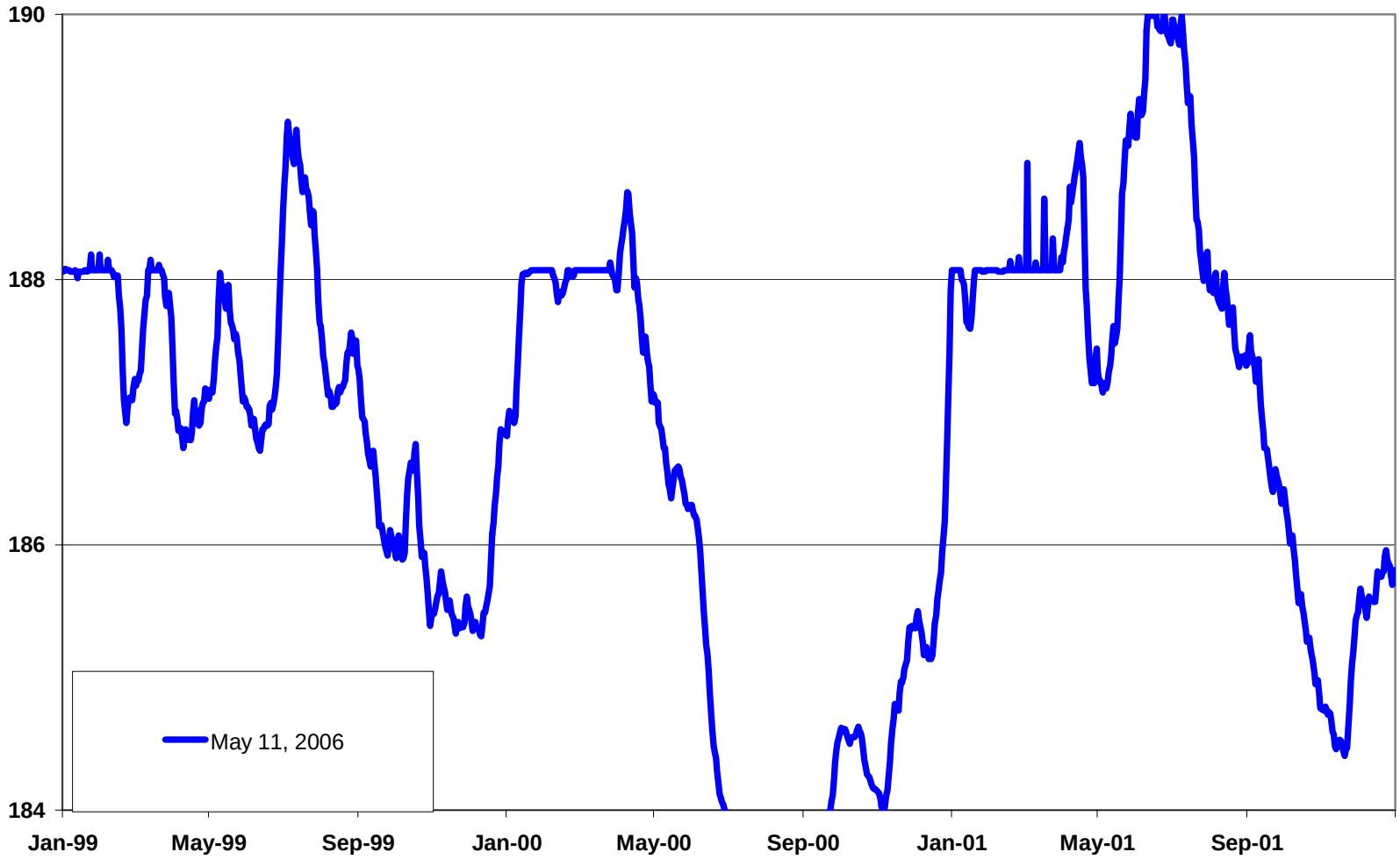


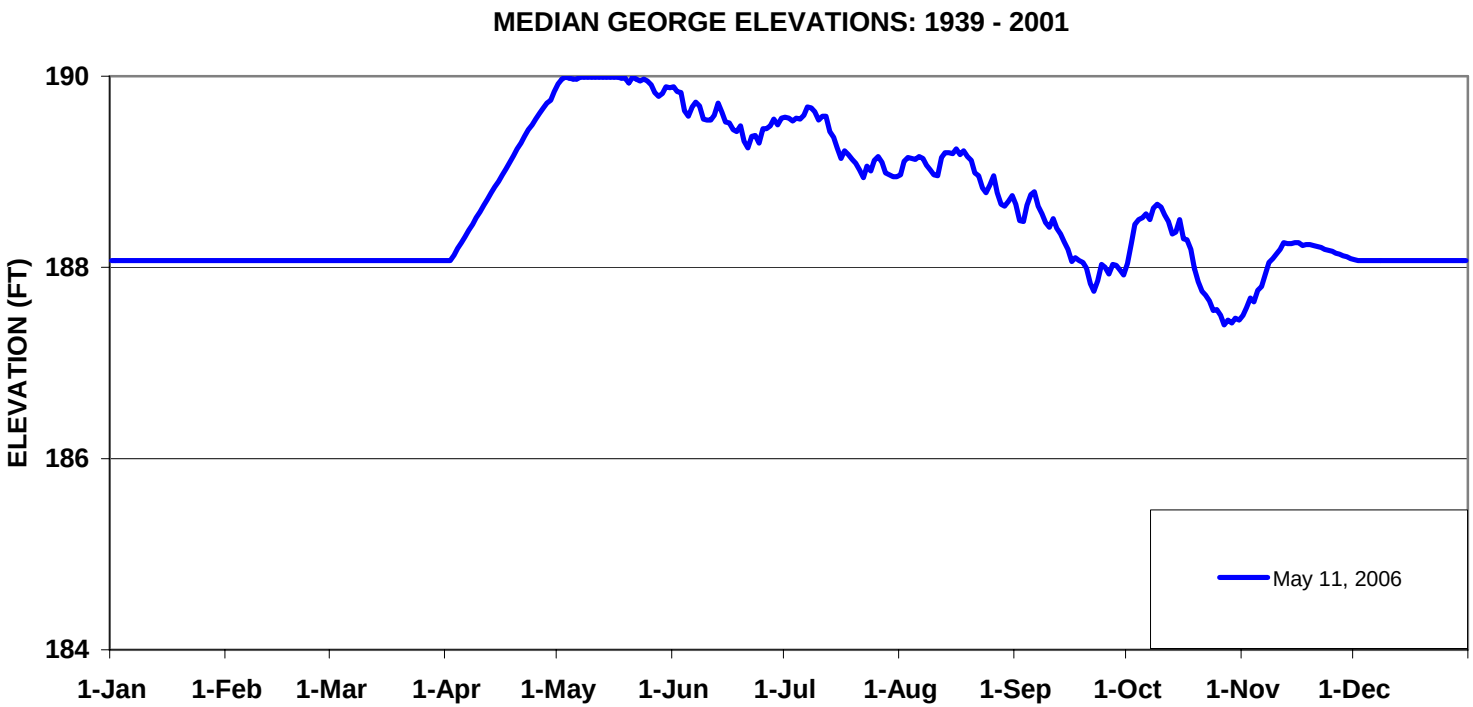
W.F. GEORGE

DAILY TIME SERIES OF ELEVATIONS AT GEORGE
1986-1988

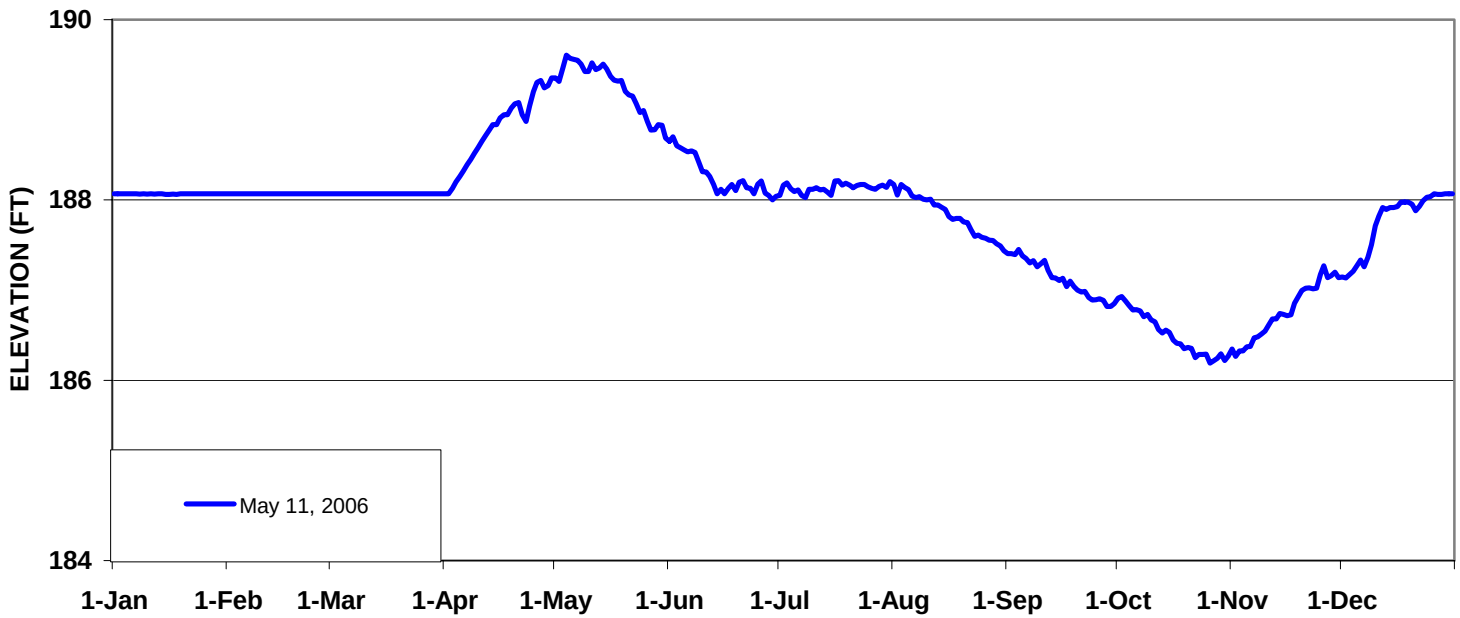


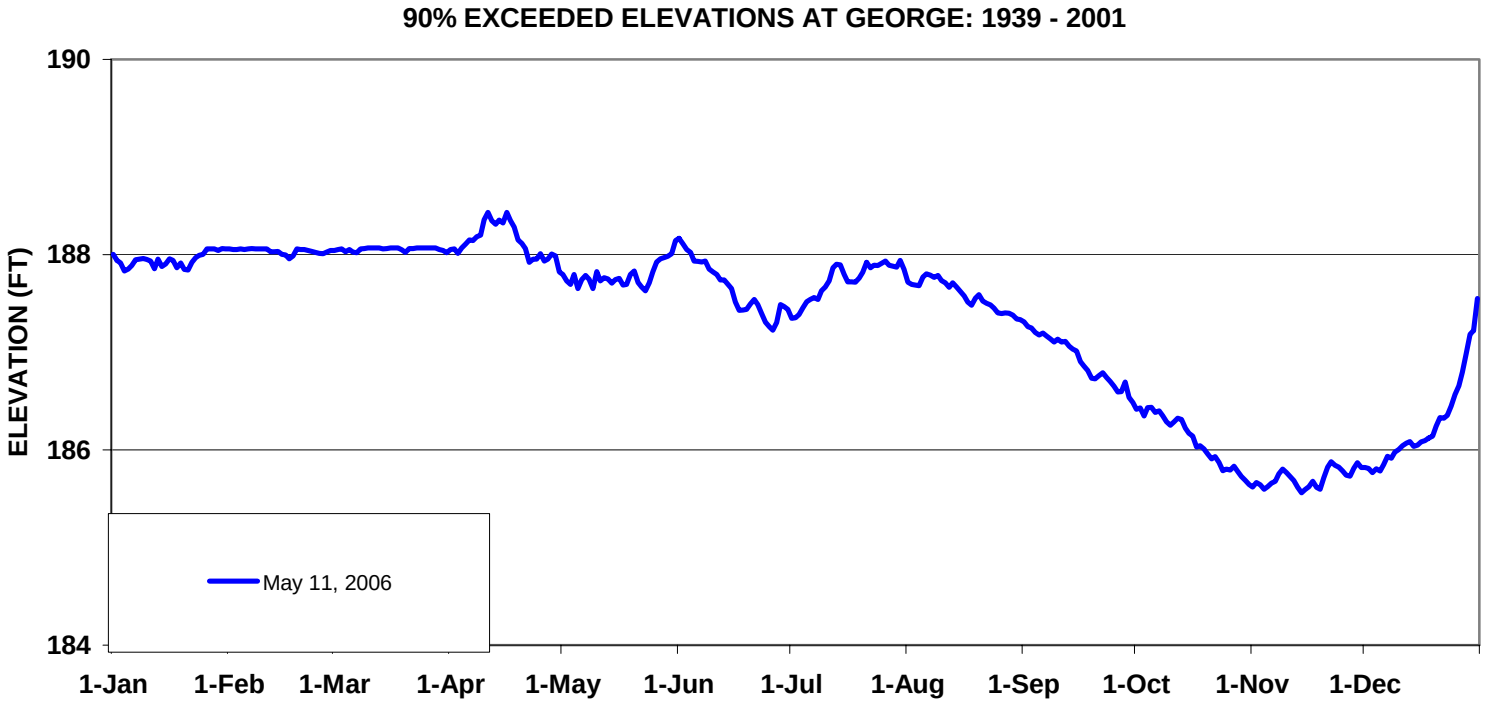
DAILY TIME SERIES OF ELEVATIONS AT GEORGE
1999 - 2001



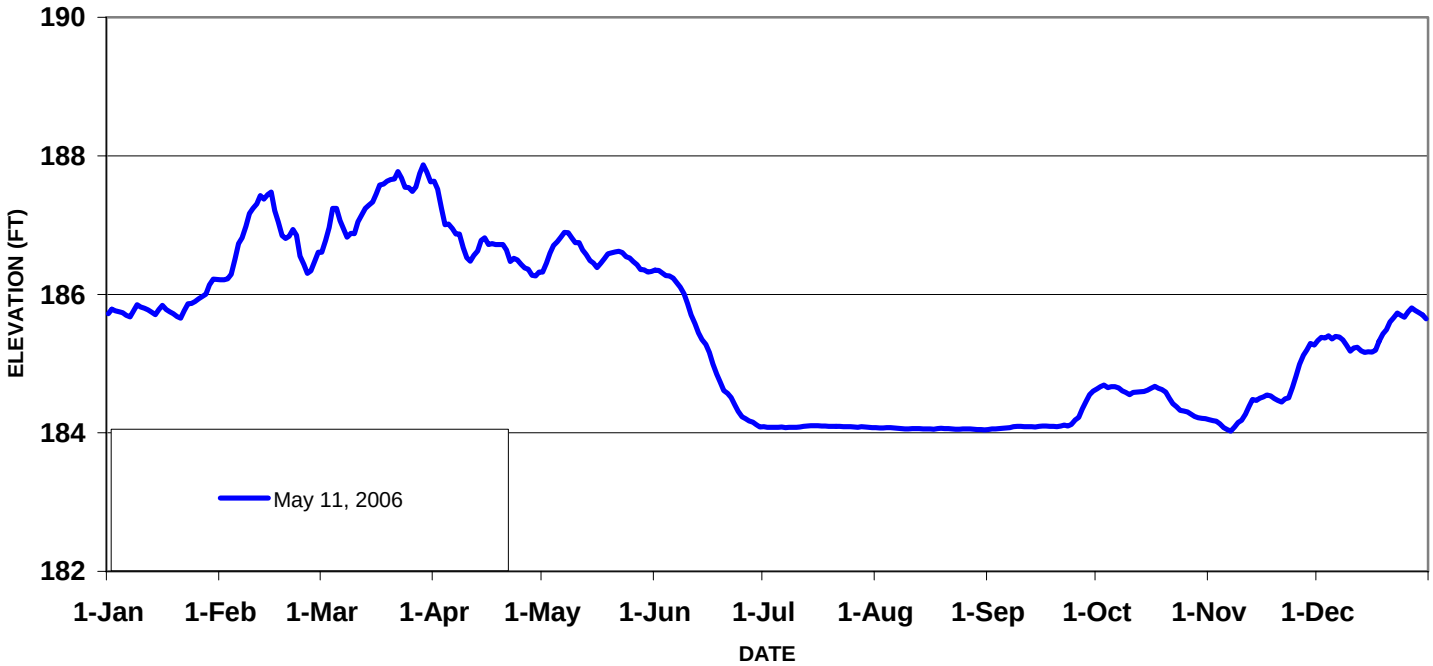

MEDIAN GEORGE ELEVATIONS: 1939 - 2001
ELEVATION (FT)
190
188
186
184
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
May 11, 2006

75% EXCEEDED ELEVATIONS AT GEORGE



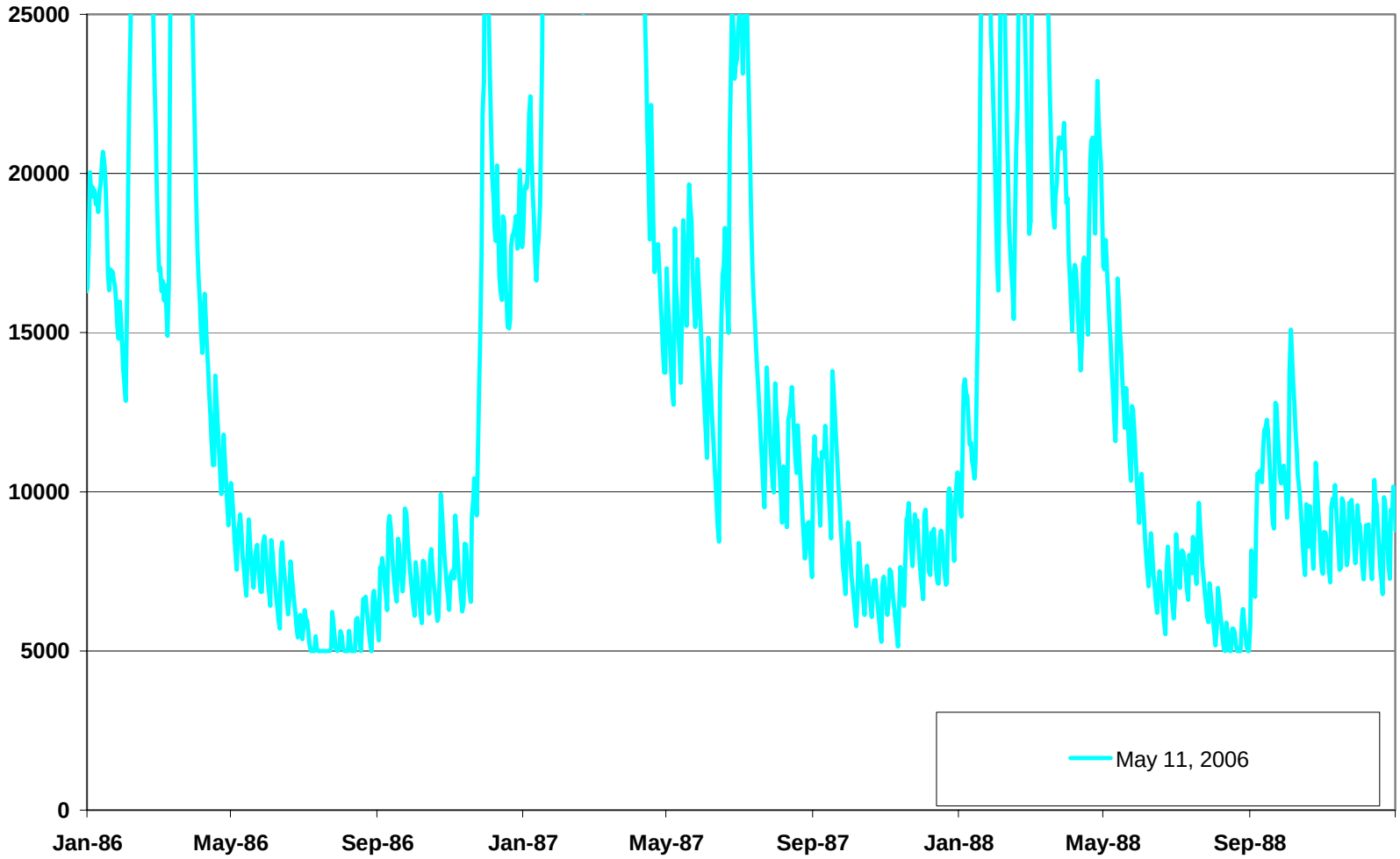

90% EXCEEDED ELEVATIONS AT GEORGE: 1939 - 2001
ELEVATION (FT)
190
188
186
184
May 11, 2006
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec

MINIMUM ELEVATIONS AT GEORGE: 1939 - 2001

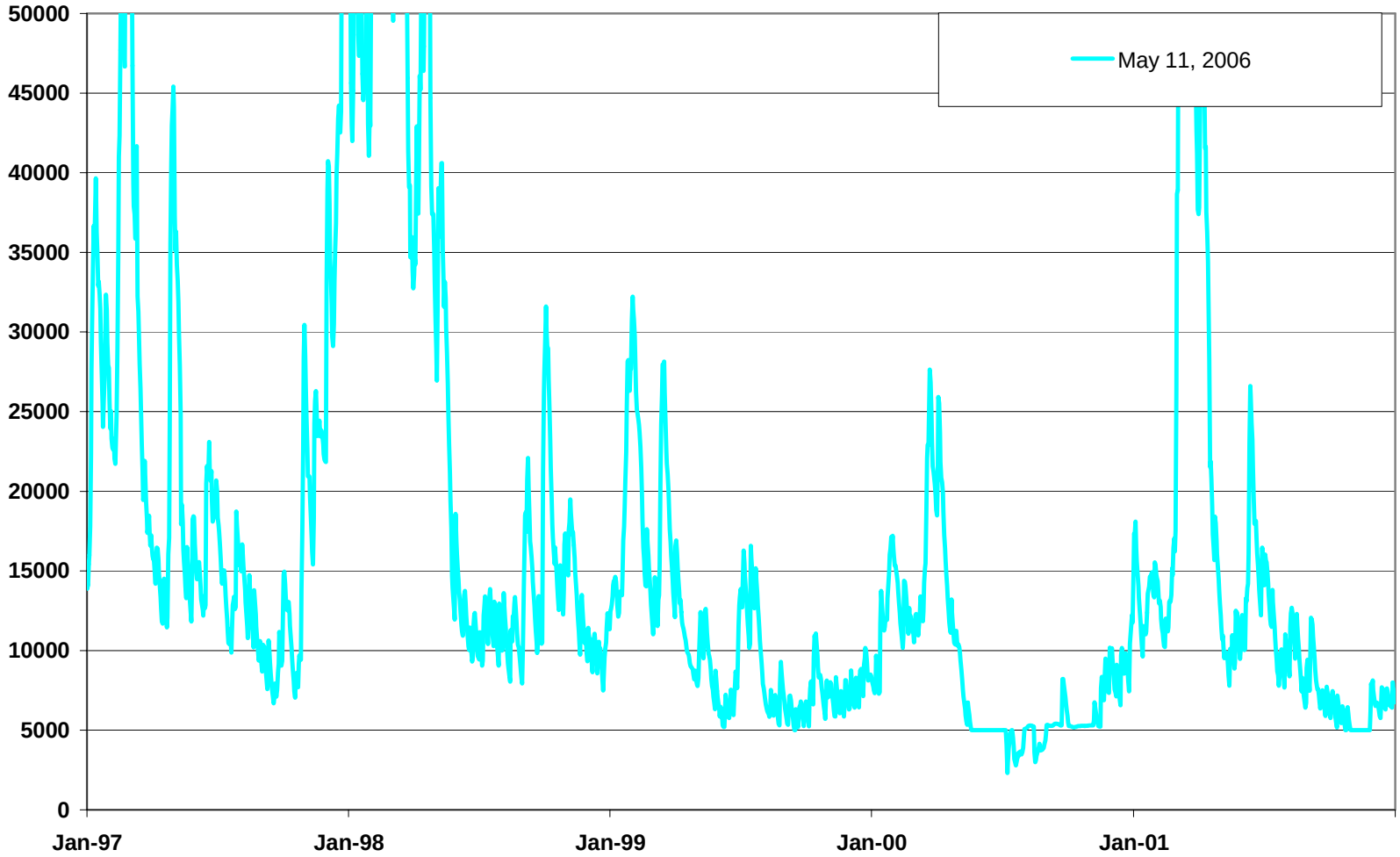


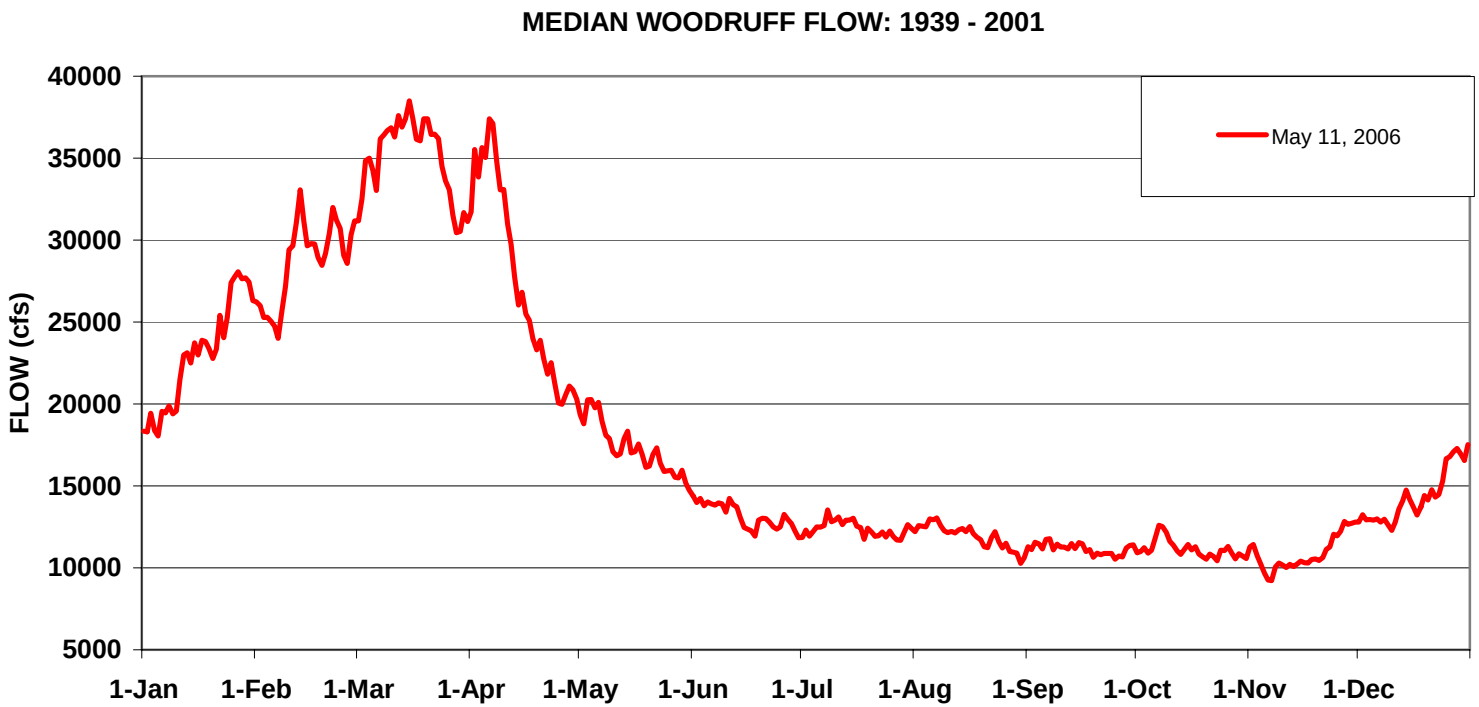
WOODRUFF OUTFLOWS

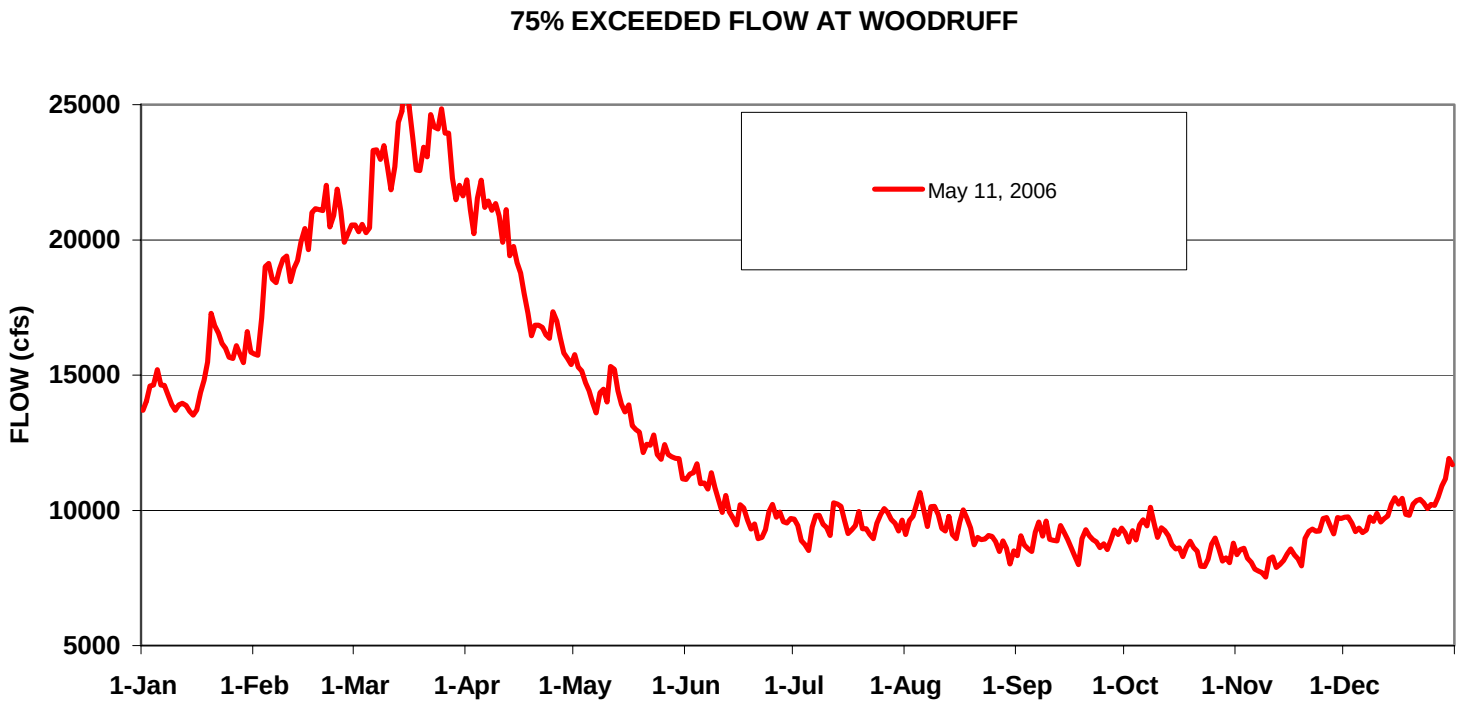
DAILY TIME SERIES OF FLOWS AT WOODRUFF
1986-1988

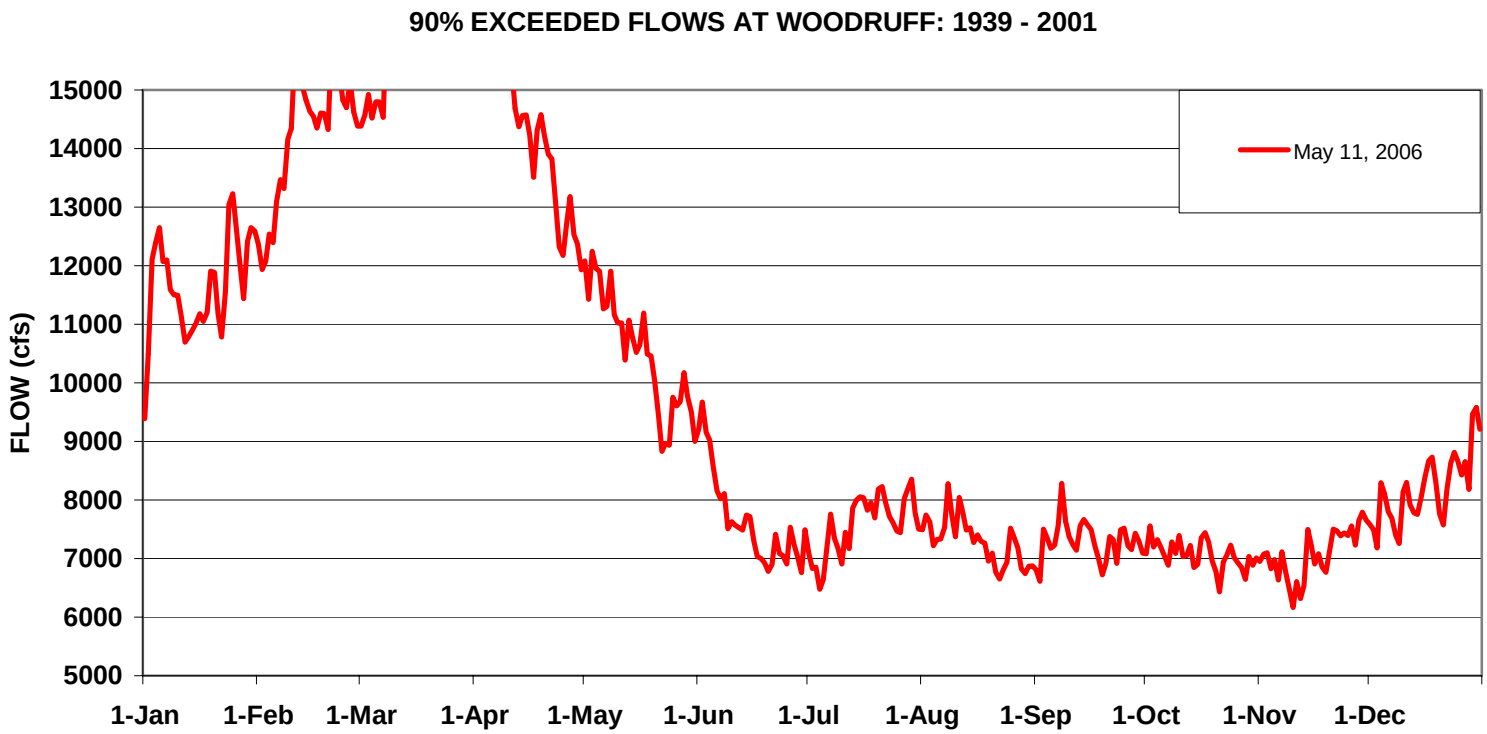


DAILY TIME SERIES OF FLOWS AT WOODRUFF
1995 - 1999




MEDIAN WOODRUFF FLOW: 1939 - 2001
FLOW (cfs)
40000
35000
30000
25000
20000
15000
10000
5000
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
May 11, 2006


75% EXCEEDED FLOW AT WOODRUFF
25000
20000
15000
10000
5000
FLOW (cfs)
May 11, 2006
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec


90% EXCEEDED FLOWS AT WOODRUFF: 1939 - 2001
FLOW (cfs)
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
May 11, 2006

MINIMUM FLOWS AT WOODRUFF: 1939 - 2001