

CBRFC – USBR call April 15th 2014 – Navajo Reservoir Forecast Clarification

Describe how we model the San Juan River above Navajo Reservoir

- Unregulated Schematic

- Regulated Schematic

Clarify the components of the Navajo Inflow Forecast CBRFC provides

- The original (legacy) forecast

- The additional (new) forecast (without Los Pinos)

Verify what USBR requires - Discussion

- Clarify the forecasts CBRFC disseminates

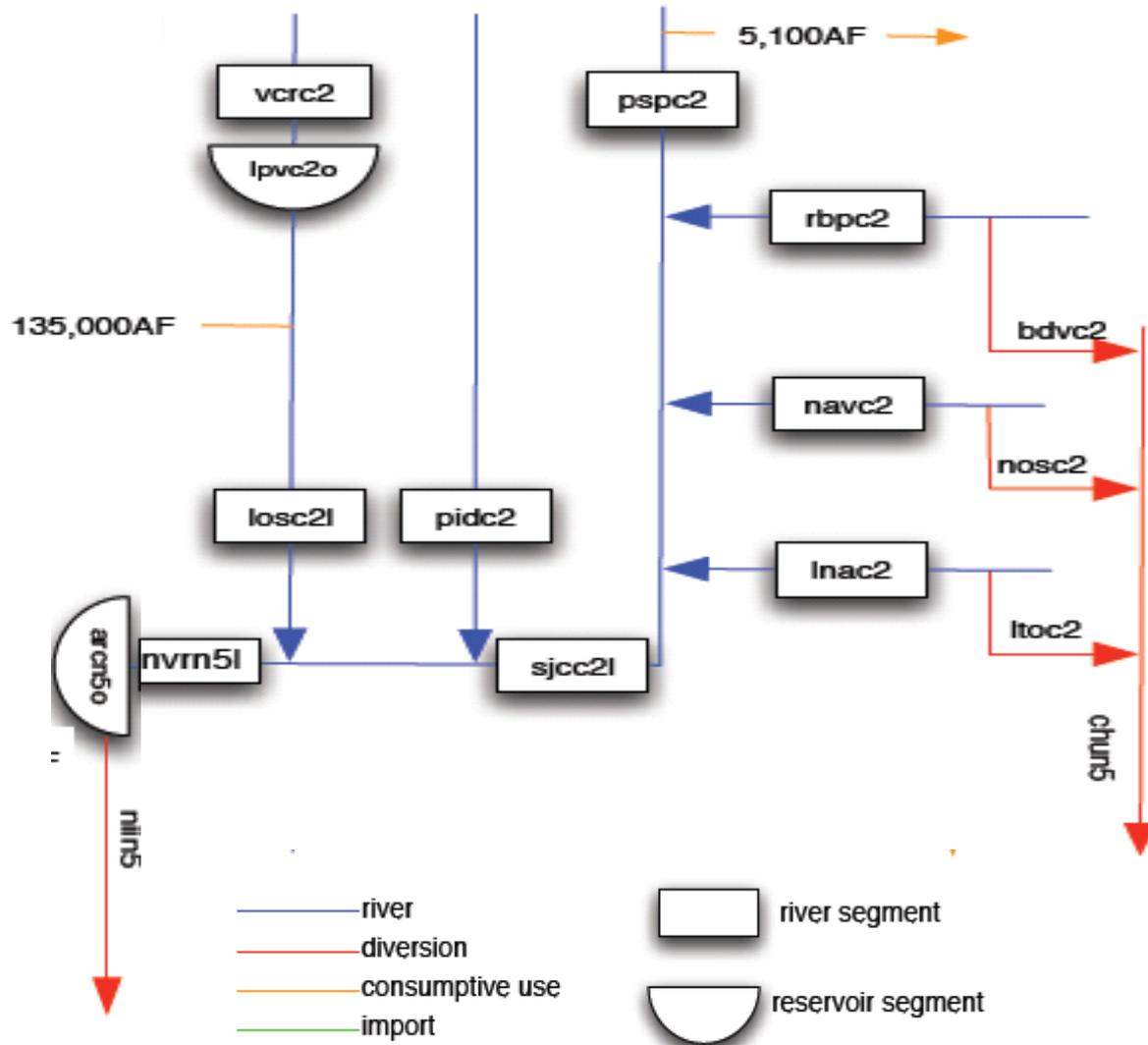
CBRFC Forecast Model segments above Navajo Reservoir – San Juan River Basin

rbpc2 = Rio Blanco
 navc2 = Navajo
 lnac2 = Little Navajo

pspc2 = San Juan- Pagosa Springs
 sjcc2l = San Juan – Carracas
 pidc2 = Piedra

vcrc2 = Vallecito inflow
 lpvc2o = Vallecito reservoir
 losc2l = Los Pinos – La Boca

nvrn5 = Navajo Inflow
 arcn5o = Navajo Reservoir

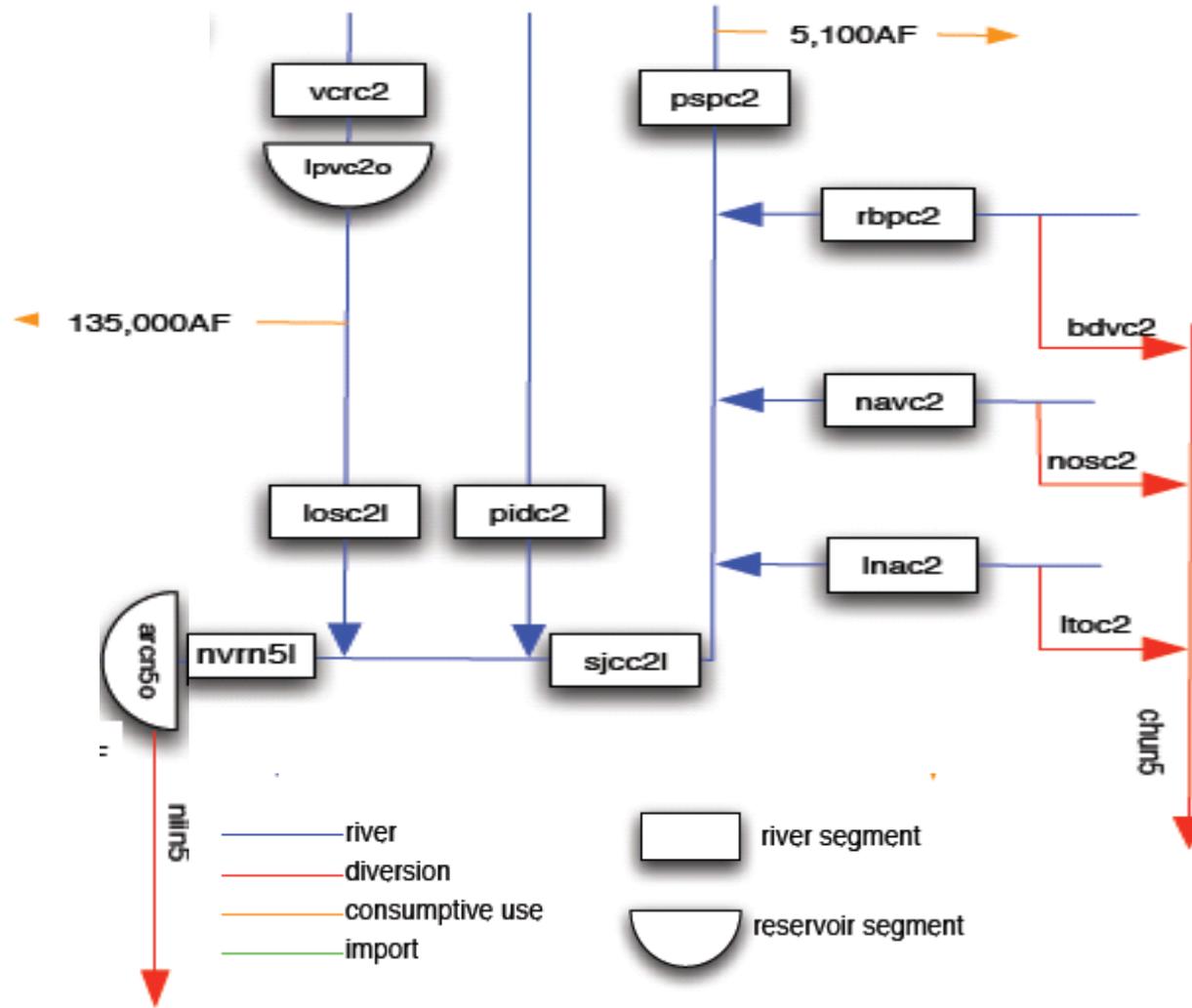


San Juan River – Navajo Reservoir Inflow

CBRFC REGULATED

We do not currently provide this to Reclamation as a long range forecast product

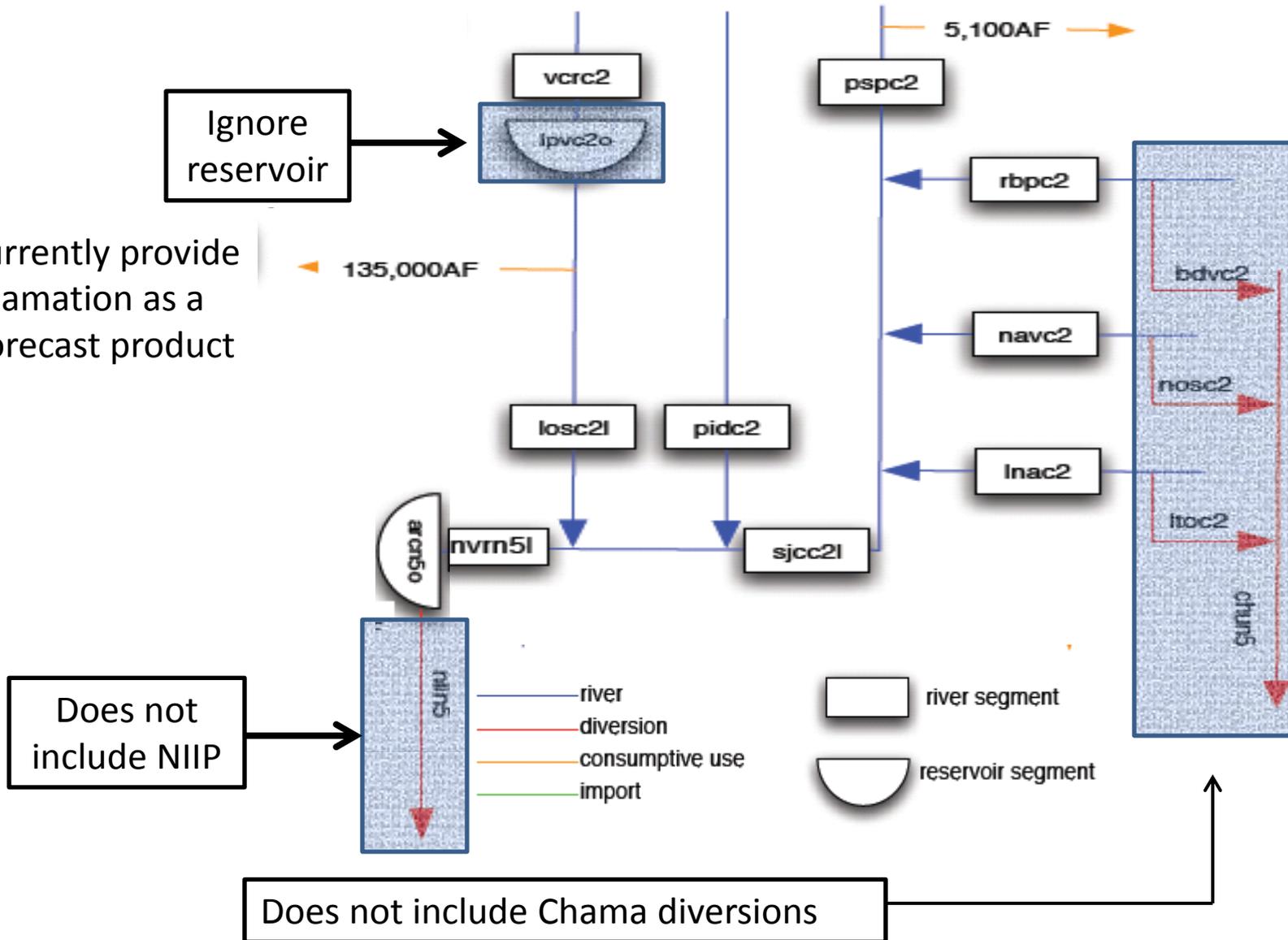
This is what you see on our daily forecast web page



San Juan River – Navajo Reservoir Inflow

CBRFC UNREGULATED

We do not currently provide this to Reclamation as a long range forecast product



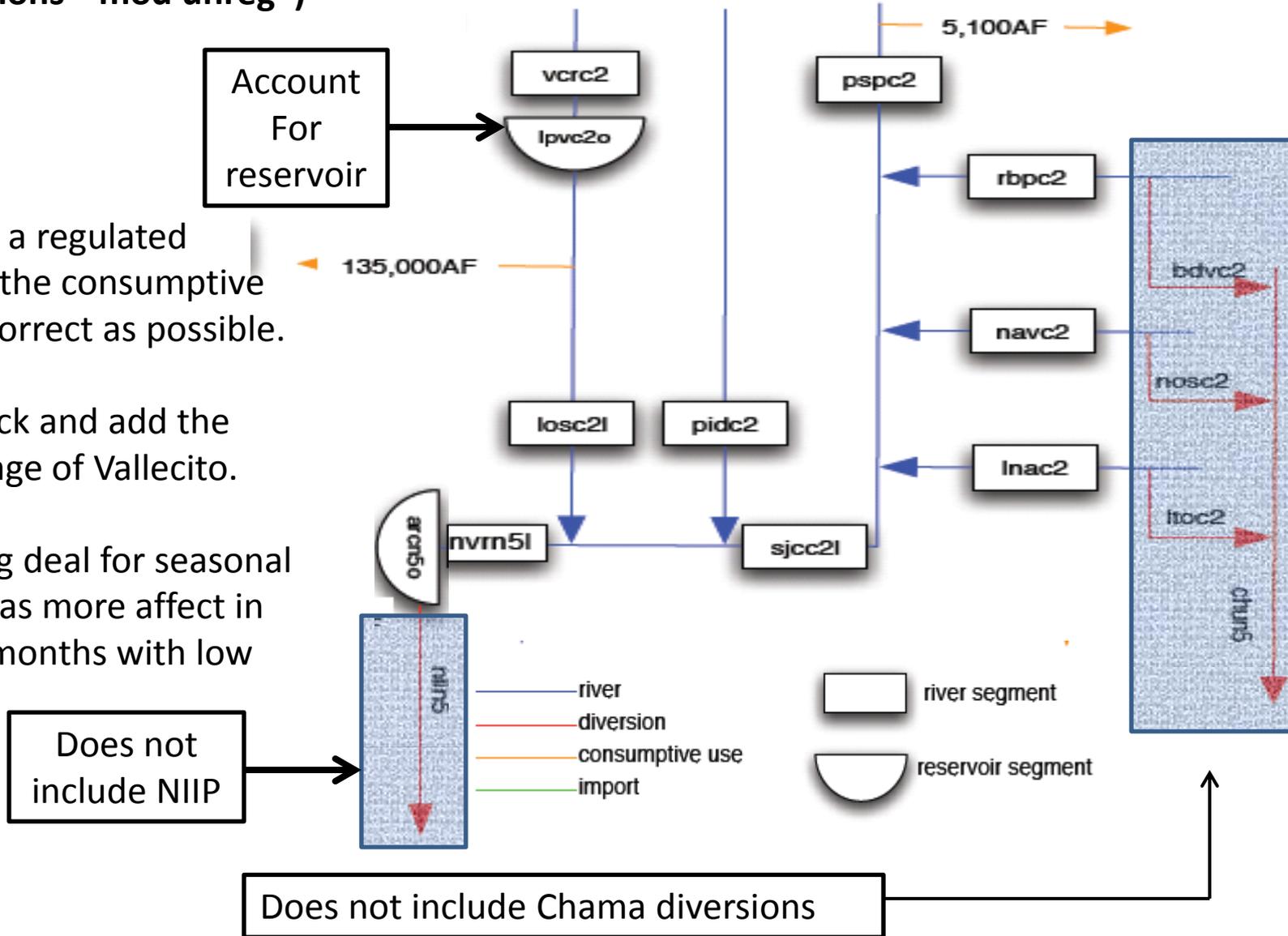
San Juan River – Navajo Reservoir Inflow

Current Navajo Inflow Forecast (reclamations “mod unreg”)

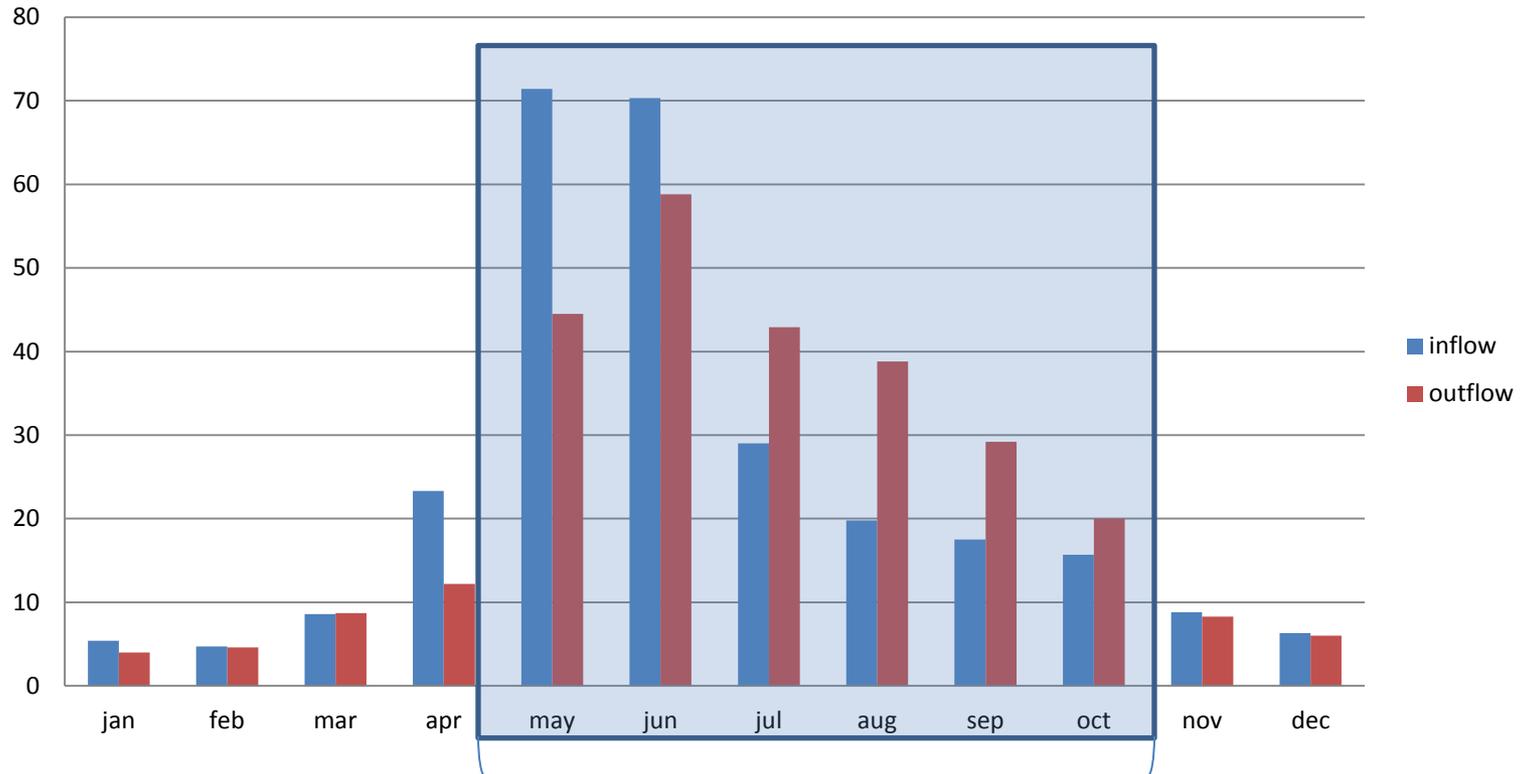
LOSC2 is run in a regulated manner to get the consumptive use timing as correct as possible.

Then we go back and add the change in storage of Vallecito.

This is not a big deal for seasonal forecasts but has more affect in later summer months with low flows.



Vallecito Reservoir Monthly Inflow vs. Outflow



Consumptive Use operation active

Amount of water removed by CONSUSE depends on amount of water available, monthly coefficients and temperature. For Vallecito this was ~135 kaf/year during the calibration period (1981-2010).

If Vallecito is run in Unregulated mode too much water is taken out May – June and not enough July – October.

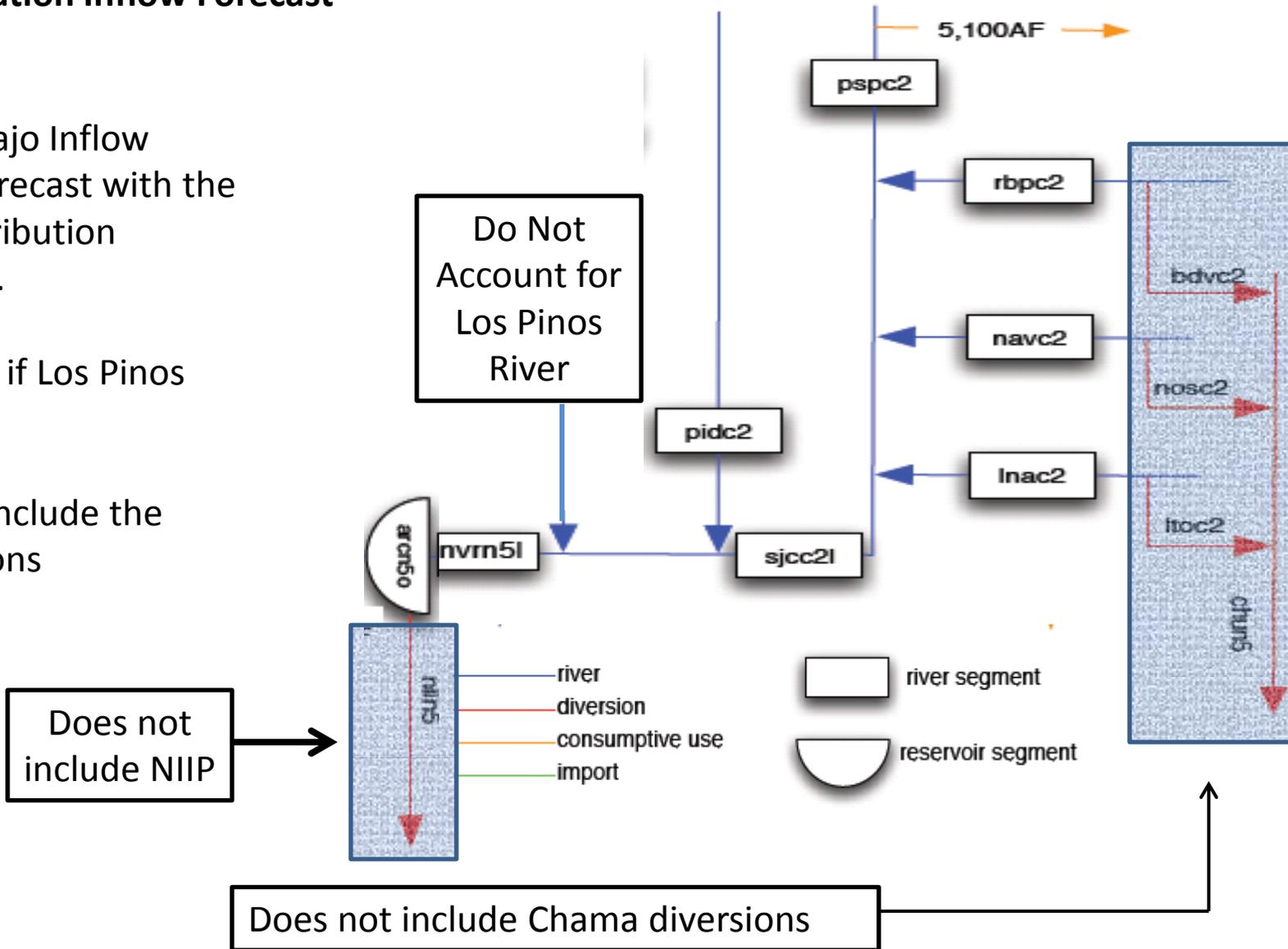
Navajo Inflow Forecast (NVLOC)

New Reclamation Inflow Forecast

This is the Navajo Inflow unregulated forecast with the Los Pinos contribution subtracted out.

It is forecast as if Los Pinos does not exist.

This does not include the Chama diversions



Forecast Clarification

5-Year Monthly

32MONTH Data Files

- [NAV2.espmvol.txt](#) Apr 2, 2014
- [NVLOC.espmvol.txt](#) Apr 2, 2014
- [NVRN5.espmvol.txt](#) Apr 3, 2014

5-Year Daily

SJ_EXTDLY Data Files

- [DRGC2.espdly.txt](#) Apr 2, 2014
- [LEMC2.espdly.txt](#) Apr 2, 2014
- [LNAC2.espdly.txt](#) Apr 2, 2014
- [NAV2.espdly.txt](#) Apr 2, 2014
- [NVLOC.espdly.txt](#) Apr 2, 2014
- [NVRN5.espdly.txt](#) Apr 2, 2014
- [RBPC2.espdly.txt](#) Apr 2, 2014
- [VCRC2.espdly.txt](#) Apr 2, 2014

NVRN5

the original USBR “(mod-unreg”) forecast

NVLOC

New Navajo unreg Inflow – Los Pinos

Monthly traces are adjusted

Daily traces are not adjusted

SLCESPCO
National Weather Service
Colorado Basin River Forecast Center
Salt Lake City, Utah
April 2, 2014

San Juan Basin Special Forecast Group

April Final Forecasts

Seasonal and Monthly forecasts for 2014
Forecast volumes in thousands of acre-feet (KAF)
Exceedance probabilities in percent

Rio Blanco	FORECAST		
	90%	50%	10%
Apr-Jul	25.0	37.0	48.0

Navajo-Chromo	FORECAST		
	90%	50%	10%
Apr-Jul	30.0	40.0	55.0

Little Navajo near Chromo	FORECAST		
	90%	50%	10%
Apr-Jul	2.5	4.0	5.5
Apr	0.5	0.9	1.5
May	1.7	2.4	3.5
Jun	0.3	0.6	1.2

Vallecito Reservoir	FORECAST		
	90%	50%	10%
Apr-Jul	126.0	175.0	230.0
Apr	15.0	21.0	29.0
May	51.0	68.0	82.0
Jun	44.0	64.0	91.0

Navajo Reservoir	FORECAST		
	90%	50%	10%
Apr-Jul	370.0	510.0	660.0
Apr	80.0	112.0	130.0
May	170.0	220.0	270.0
Jun	110.0	150.0	220.0

Animas - Durango	FORECAST		
	90%	50%	10%
Apr-Jul	320.0	400.0	520.0
Apr	29.0	42.0	70.0
May	120.0	155.0	200.0
Jun	110.0	148.0	190.0

Lemon Reservoir	FORECAST		
	90%	50%	10%
Apr-Jul	29.0	45.0	68.0
Apr	3.0	5.0	9.0
May	14.0	20.0	26.0
Jun	11.0	16.0	26.0

Additional slides follow based on discussion and proposed new forecast method for consideration.

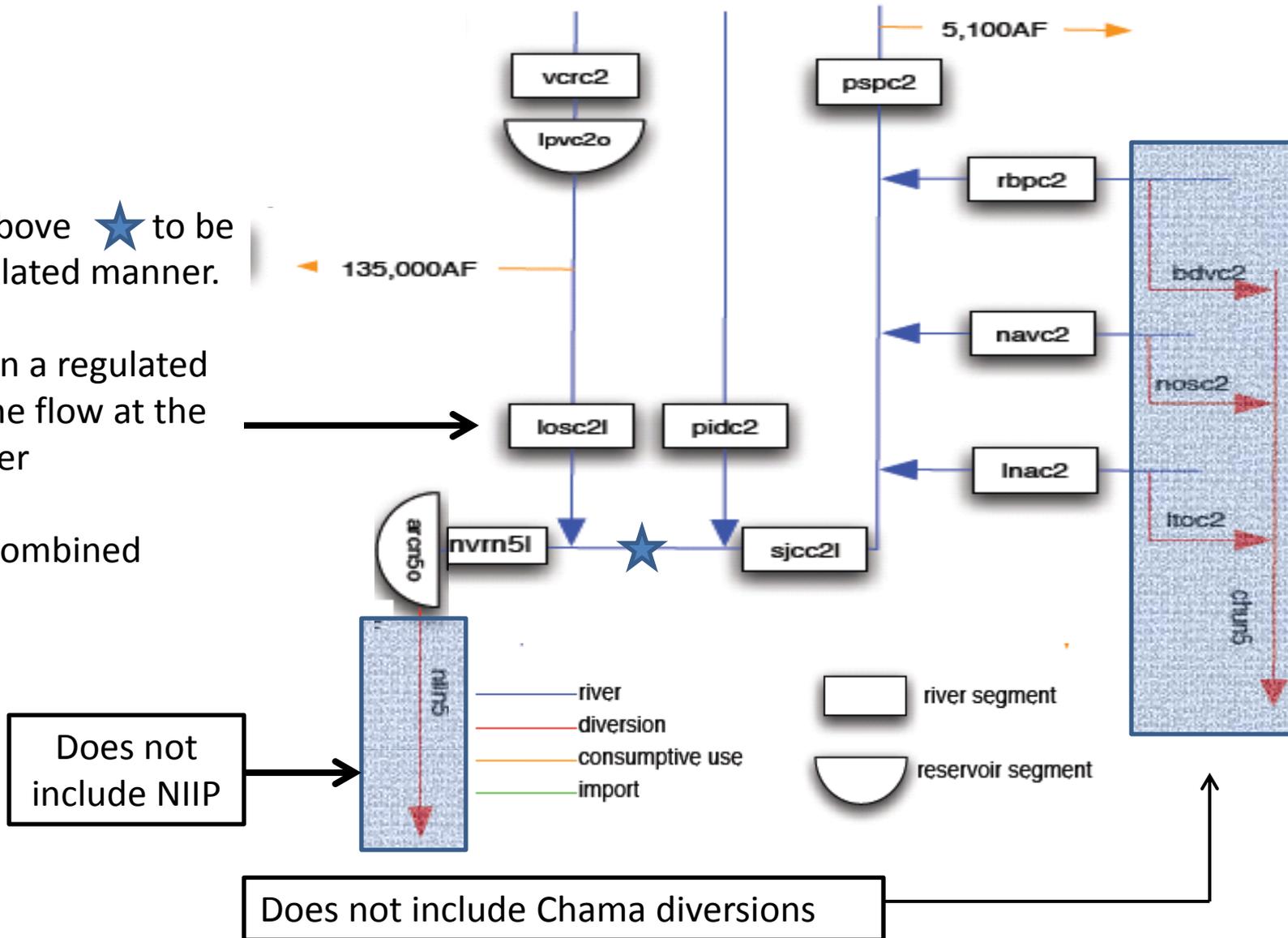
San Juan River – Navajo Reservoir Inflow

Proposed New Navajo Inflow Forecast

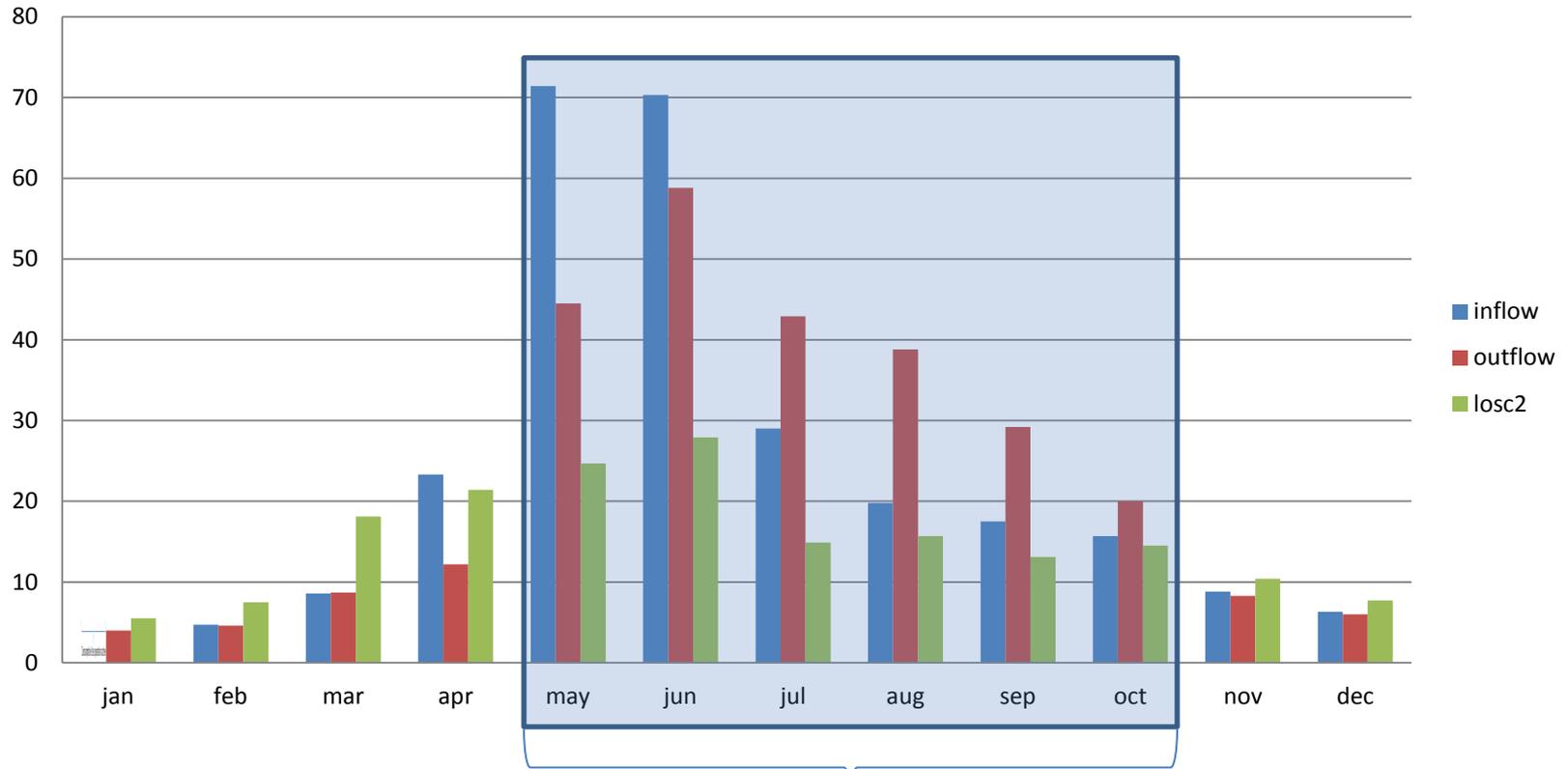
San Juan River above ★ to be run in an unregulated manner.

Los Pinos is run in a regulated manner to get the flow at the mouth of the river

These are then combined



Vallecito Reservoir Inflow/Outflow Los Pinos Observed Flow at Mouth



Consumptive Use operation active
to account for losses between
Vallecito outflow and observed flow
at mouth (losc2)

Navajo (current USBR definition) – From documents at CBRFC

$$\text{UnregInflow}[t] = \text{Inflow}[t] + (\text{ValStor}[t-\text{lag}] - \text{ValStor}[t-1-\text{lag}]) + \text{ValEvap}[t-\text{lag}]$$

Where lag is 1 day

$$\text{ModifiedUnregulatedInflow}[t] = \text{UnregInflow}[t] + \text{AzoteaTunnel}[t]$$

Navajo Proposed

$$\text{NewInflow}[t] = \text{Inflow}[t] + \text{AzoteaTunnel}[t]$$