Scenario Descriptions

Scenario 1: Planning for Extended Drought

Climate variability suggests that the next big drought that Santa Cruz experiences may not look like the worst drought on record (the 1976–1977 drought) or the second-worst drought on record (the 1987–1992 drought). In this scenario, Santa Cruz prepares for a plausible extended drought event that looks like both the 1976–1977 and 1987–1992 droughts occurring back to back; regardless of the regulatory decision regarding fish flows (i.e., this scenario requires you to develop a portfolio that can meet the needs of whichever regulatory decision is made regarding fish flows).

Group Members:

Two teams will work this scenario. Teams will be assigned during the meeting.

Scenario Technical Description

Assumptions

C*onfluence* results assume:

- Base interim 2020 projected demands updated with latest information provided by the University of California, Santa Cruz (UCSC).
  - Annual demand is approximately 3.2 bg.
  - Peak-season demand is approximately 1.9 bg (May through October).
  - Rule curves for lake drawdown reflect the realization that in the real world, system operators would have no way of knowing in the initial two years that a drought event is occurring. However, after that, we assume that the City begins to draw down the lake, ultimately to zero.[1]

The demand supply gap is provided in Table 1 for both Department of Fish and Game (DFG-5) fish flow rules and Table 2: City proposed fish flows, using the revised Interim Mid-Range Demand Forecast

Figure 1 shows peak season shortages for extended drought, and Figure 2 shows lake levels under extended droughts. Tables 1 and 2 provide additional shortage statistics.

1. Actually, the lake is drawn down to 70 mg, which is the volume that is assumed to be physically inaccessible.

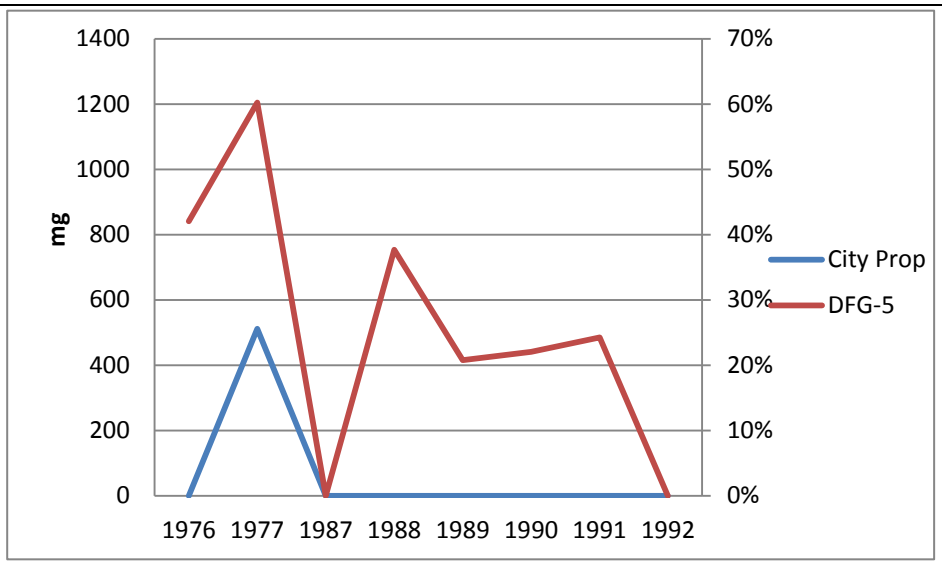

Figure 1. Peak season shortages for extended drought.

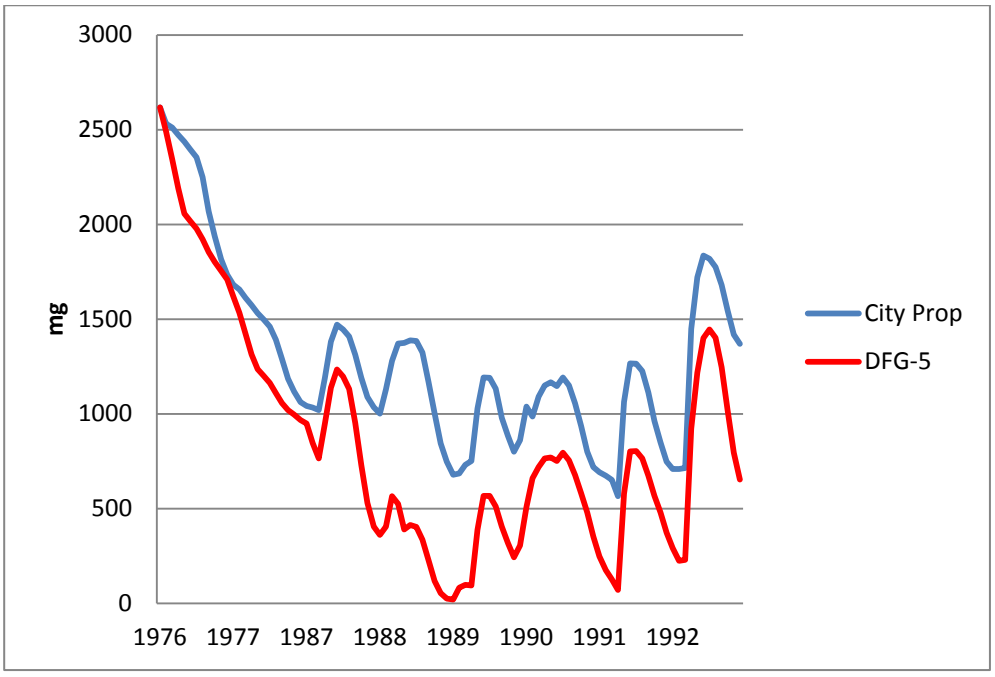

Figure 2. Lake levels: Extended drought and revised interim mid-range demand forecast.

Table 1. Extended drought peak-season shortage statistics with DFG-5 flows

	Millions of gallons the City does not deliver each year due to shortage	Percent of peak-season demand (2.0 bg) the City cannot meet each year
Year 1	841	44%
Year 2	1,205	63%
Year 3	0	0%
Year 4	754	40%
Year 5	415	22%
Year 6	441	23%
Year 7	484	25%
Year 8	0	0%
Total	**4,141**	
Average	**512**	**27%**
Maximum	**1,205**	**63%**
Minimum	**0**	**0%**

Table 2. Extended drought peak-season shortage statistics with City proposed flows

	Millions of gallons the City does not deliver each year due to shortage	Percent of peak-season demand (2.0 bg) the City cannot meet each year
Year 1	0	0%
Year 2	511	27%
Year 3	0	0%
Year 4	0	0%
Year 5	0	0%
Year 6	0	0%
Year 7	0	0%
Year 8	0	0%
Total	**511**	
Average	**64**	**3%**
Maximum	**511**	**27%**
Minimum	**0**	**0%**

Scenario Descriptions

Scenario 2: The Climate Changes

This scenario represents a future with higher temperatures and changes in precipitation patterns due to climate change regardless of the regulatory decision regarding fish flows (i.e., this scenario requires you to develop a portfolio that can meet the needs of the regulatory decision regarding fish flows).

Group Members:

Two teams will work this scenario. Teams will be assigned during the meeting.

Scenario Technical Description

Assumptions

C*onfluence* results assume:

- Base interim 2020 projected demands updated with latest information provided by UCSC.
  - Annual demand is approximately 3.2 bg
  - Peak-season demand is approximately 1.9 bg.

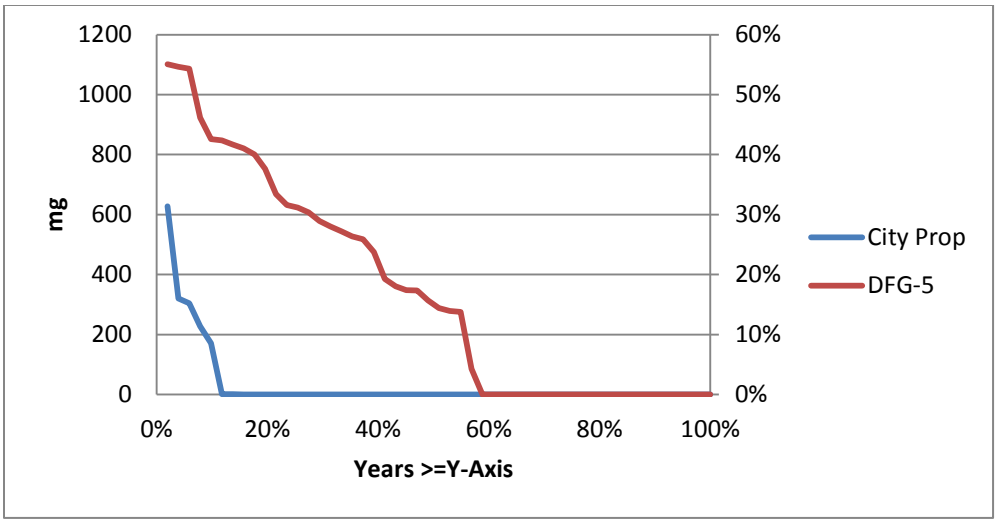

Figure 1. Peak-season shortage duration curves with climate change: Revised interim mid-range demand forecast.

Table 1: Probabilities of peak-season shortage events in any year: Climate change and revised interim mid-range demand forecast

Shortage event	City proposal	DFG-5
> 50%	0%	6%
> 25%	2%	37%
> 15%	6%	49%
> 5%	10%	55%

Table 2: Probabilities of occurrence of peak-season shortage events over 30-year period: Climate change and revised interim mid-range demand forecast

Shortage event	City proposal	DFG-5
> 50%	0%	84%
> 25%	45%	100%
> 15%	84%	100%
> 5%	95%	100%