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March 6, 2018

MEMORANDUM

TO: Power Committee

FROM: Ben Kujala

SUBJECT: Bonneville FY17 Oversupply Review

BACKGROUND:

Presenter: Pam Van Calcar

Summary: Bonneville has completed a review of the Oversupply conditions that were experienced in the spring of 2017. They will present to the Power Committee on that review

Relevance: Oversupply is a condition where the power system has a supply and demand imbalance. Understanding the challenges seen in operations can inform the long-term planning problems addressed in the Council's Power Plans.

Background: When river flows are high, extra water can be spilled from the dams so that it does not contribute to oversupply, but too much spill exceeds water quality standards and can harm fish and other aquatic species. If water cannot be spilled, it must be passed through the hydropower turbines, thus generating electricity.

In these conditions, BPA may need to implement the Oversupply Management Protocol, under which non-hydro generation is displaced to protect aquatic life and maintain system reliability. Under the protocol, BPA compensates generators for their displacement-related costs.

More Info: <https://www.bpa.gov/projects/initiatives/oversupply/Pages/default.aspx>

2017 Oversupply Management Review (from 12/21/2017)

3-15-2018

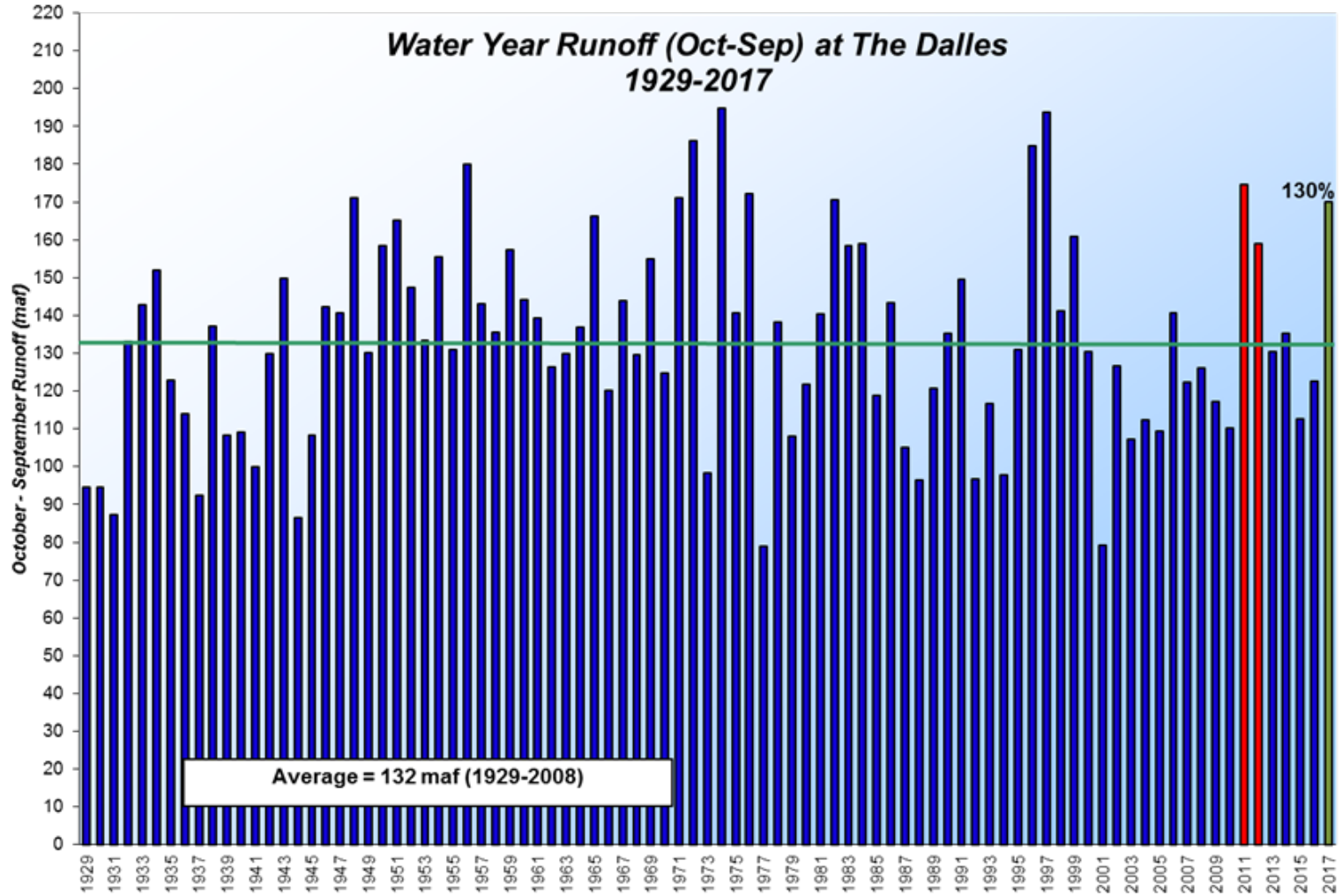
What is OMP

- OMP is “Oversupply Management Protocol”
- OMP occurs when there is surplus of energy in the NW due to large volumes of water passing through the FCRPS system.
- FCRPS will spill for lack of load up to the prevailing gas cap before calling on OMP.
- OMP has a mechanism for compensating displaced generation based on approved displacement costs.
- The overall cost of OMP is to be shared with the generators and the public utility customers and is allocated based on which generators are running during the hours of OMP.

Factors contributing to the implementation of the Oversupply Management Protocol (OMP) in 2017.

- Water supply volume was 130% of average. (Slide 4) The projected volume had an unprecedented increase across the spring.
- Early season high flows limited the amount of spill available before hitting TDG limits. This is a high risk period if a similar, early run off were to occur in the future.
- The FCRPS was under Army Corp of Engineers (COE) directed emergency flood control operations starting 3/21/2017 for protecting Portland.
 - COE Total Dissolved Gas (TDG) Reporting:
http://pweb.crohms.org/ftppub/water_quality/tdg/
- California installed over **9000 MW** more of metered solar installed since 2012 and had an above average snowpack which resulted in limited ability for BPA to export energy during the daytime.
- AC intertie was derated a few times for maintenance.
 - Intertie Capacity Reporting:
<https://transmission.bpa.gov/Business/Operations/Paths/>
 - Retrospective Report with Unused Intertie Capacity
 - Report available here:
<https://www.bpa.gov/Projects/Intiatives/Oversupply/Pages/default.aspx>
- Columbia Generating station output was reduced as coordinated with project operators before it began its refueling cycle on 5/13/2017.

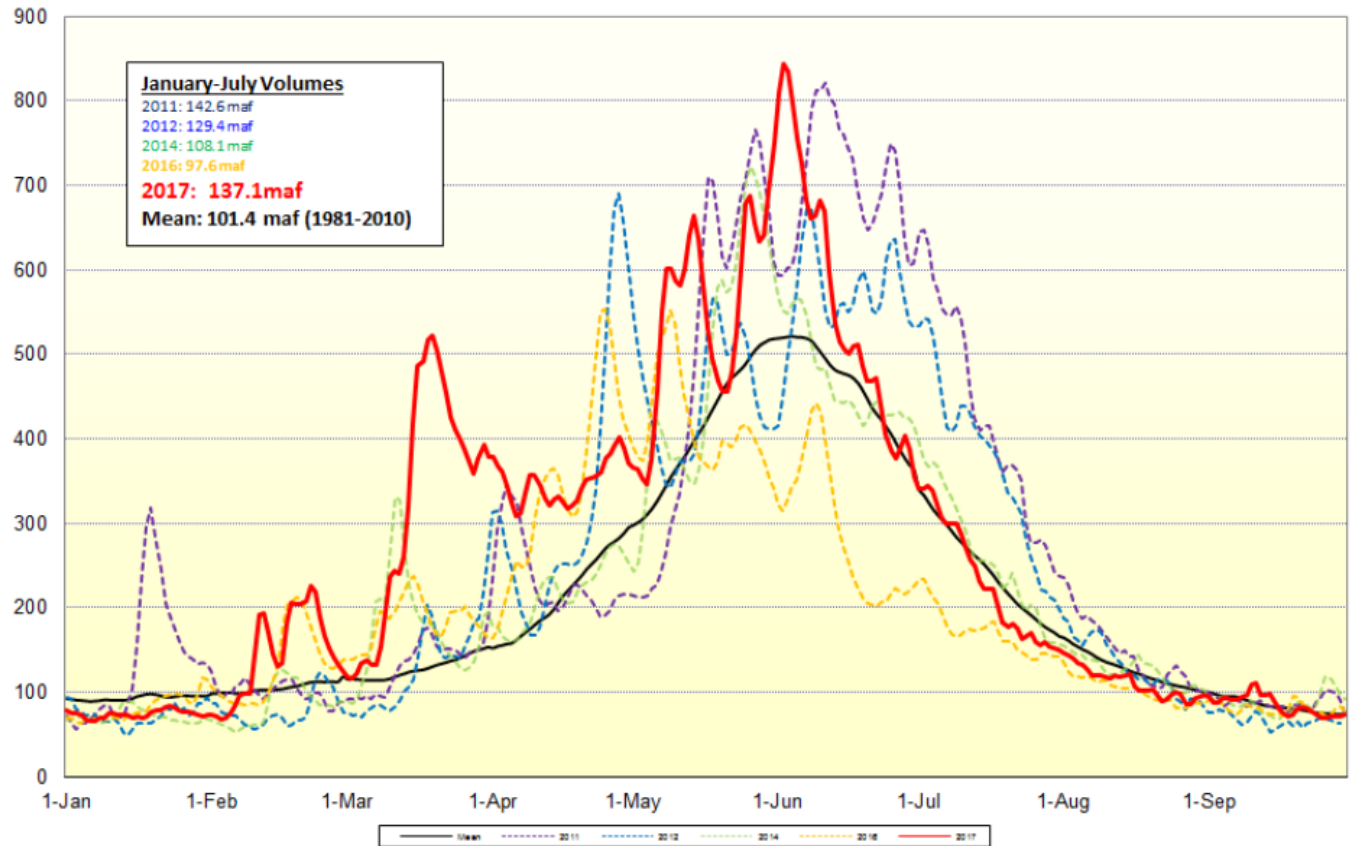
Historical Comparison of Water Years



- Red Bars are the previous years there has been generator displacement.
- 2017 is the 5th largest water year since 1974.

Comparison of water years

Natural Flows Comparison at The Dalles

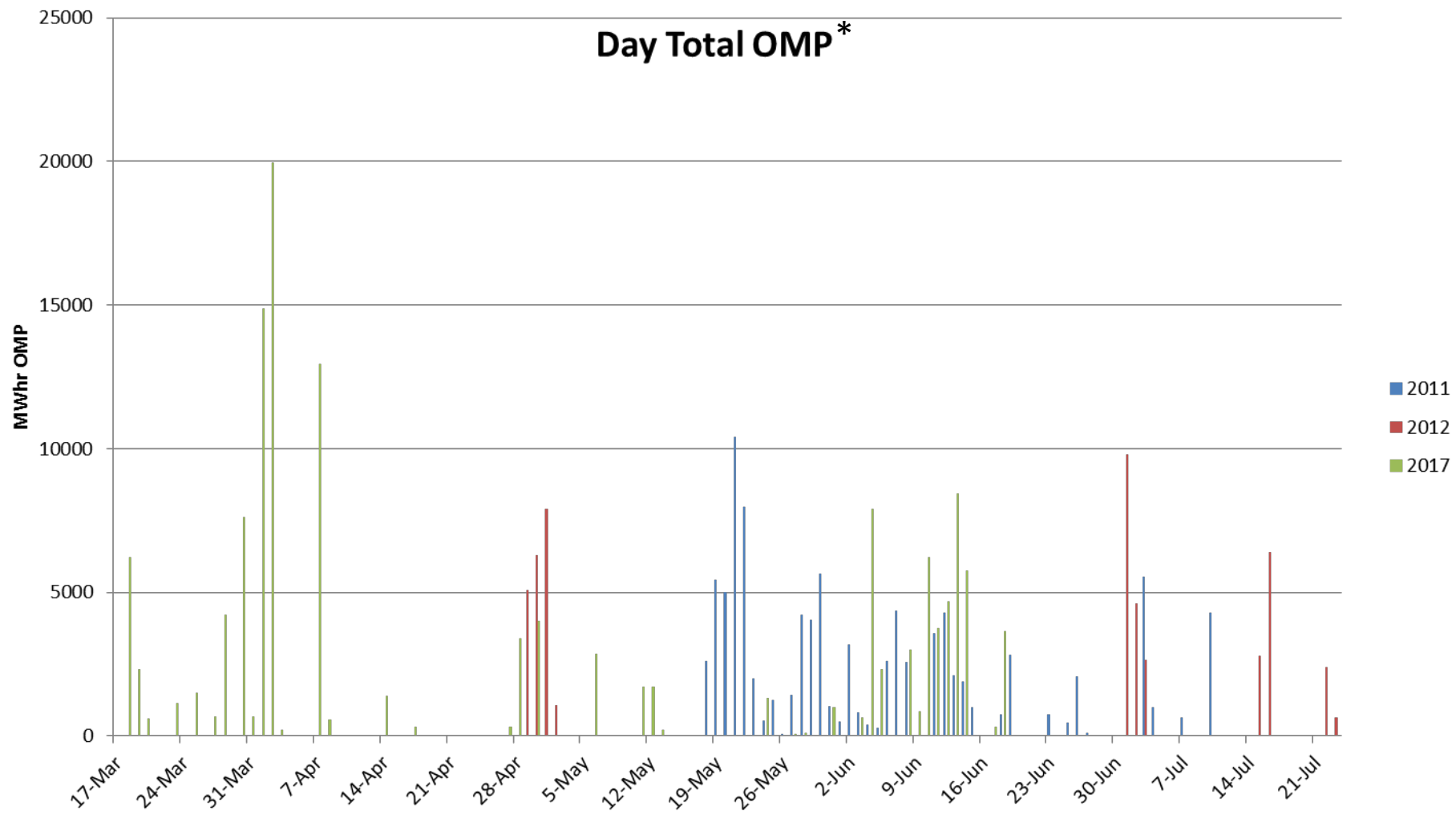


Year	Jan - July (MAF)	Line color
2011	142.6	Purple dash
2012	129.4	Blue dash
2017	137.1	Red

Bonneville Power Administration, PGPW

Summary of OMP in 2017

- OMP called on 39 times from 3/17/17 through 6/18/17.
- This year OMP started before the gas waivers for water quality started on 4/1, which limited the amount of water that could be spilled.
- 13 days had significant requests for displacement during HE7 – HE22. These are the heavy load hours for marketing purposes. Previous years had minimal to no displacement during these hours.
- 2017 had a period of 48 hours straight of requesting OMP displacement.
- The runoff shape was early (Slide 5), which resulted in nearly 80 GW-hrs of OMP through April 25th(Slide 7).
- The amount of OMP requested was 139,638 MW-hrs.
- The displacement costs of OMP was around \$2.2 million.
- The Oversupply Management Protocol business practice was updated on April 28, 2017 to include mandatory waivers during OMP events which resulted in approximately 63 GW-hrs of less wind displacement and reduced OMP costs by around \$1 M.



- The 2017 OMP season started and ended earlier than previous years.
- The early 2017 displacement was very large.

*2017 amounts are requested amounts. 2011 and 2012 are billed amounts.