CASCADE RESERVOIR WATER QUALITY RELATIONSHIPS TO 1995 SALMON MIGRATION FLOW RELEASES

- Cascade Reservoir has water quality problems caused by nuisance algal blooms - blooms are stimulated by phosphorus from various watershed sources

- A 1982 Idaho Department of Fish and Game study described potential for winter fish kills resulting from oxygen depletion associated with decomposition of altgal material under ice cover

- IDF&G recommended a 300,000 acre foot minimum pool to maintain an acceptable risk of winter kill - Reclamation administratively established the minimum pool and has maintained a minimum conservation pool greater than 300,000 acre-feet because adequate water supplies have been available.

- There is a concern that the 300,000 acre-foot minimum pool is no longer adequate to protect reservoir salmonids because phosphorus loading and algal blooms may have increased since IDF&G studies were completed.

- Reclamation measurements of August-September algal density don't confirm an increasing problem over time, but suggest there is a loose relationship to water supply (see attached figure). August-September chlorophyll a is used as a relative measure of the annual production of oxygen demanding material present, going into the winter period of ice cover.

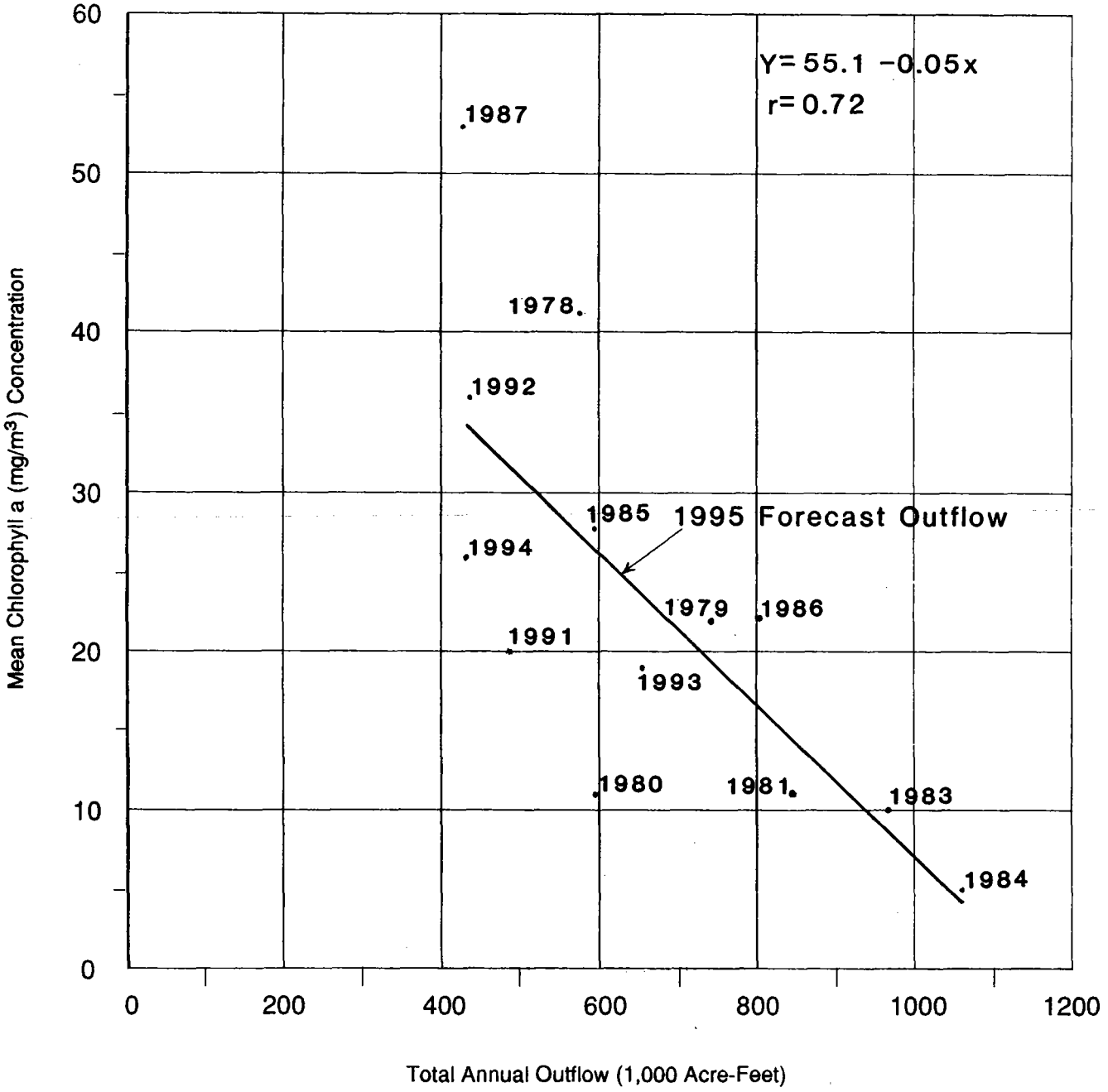
- Based on the April 1 forecast of total 1995 reservoir outflow, predicted August-September is projected to be higher than the median of all years, and similar to conditions that were projected for 1993, the last relatively good water year - actual conditions could be considerably better or worse.

- Risk of fish kills is a function of both the quantity of oxygen demanding material and the duration of snow on ice during the winter of 1995-1996.

- Reclamation's water quality monitoring program at Cascade Reservoir includes (1) August-September chlorophyll a data from 5 reservoir sites, (2) monthly outflow quality data to address water quality impacts of seasonal changes in releases (1994 data attached), and (3) monthly data from the North Fork Payette River immediately downstream of the McCall Wastewater Treatment Plant to provide data on quality of the effluent, and to detect any abnormal discharge events.

- Other Reclamation water quality activities at Cascade Reservoir include (1) working with the City of McCall to secure Federal financial assistance in implementing a municipal waste water reuse project, (2) cooperation in development of constructed wetlands for treatment of nonpoint source phosphorus loads, and (3) cooperation in development of a water quality model to facilitate management decisions regarding effectiveness of in-reservoir water quality management options.

RELATIONSHIP BETWEEN AUGUST - SEPTEMBER CHLOROPHYLL a CONCENTRATION AT 5 SITES IN CASCADE RESERVOIR AND TOTAL ANNUAL OUTFLOW



Total Phosphorus Concentrations at Cascade Reservoir Outflow

