

Ocean Wastewater Discharge in the State of California Report and Inventory Prepared by Heal the Ocean

February 2010

<http://www.healtheocean.org/>

Additional References, Summaries, and Sources

Miscellaneous

The Bay Delta Conservation Plan (BDCP) website (accessed October 2009).

A Collaborative Approach to Restore the Sacramento-San Joaquin Delta's Ecosystem and Protect Water Supplies. The Bay Delta Conservation Plan (BDCP) is being developed to promote the recovery of endangered, threatened and sensitive fish and wildlife species and their habitats in the Sacramento-San Joaquin Delta in a way that will also protect and restore water supplies. The BDCP is: Identifying conservation strategies to improve the overall ecological health of the Delta Identifying ecologically friendly ways to move fresh water through and/or around the Delta Addressing toxic pollutants, invasive species, and impairments to water quality Establishing a framework and funding to implement the Plan over time

<http://baydeltaconservationplan.com/default.aspx>

California per capita water use map. Utility Consumers' Action Network webpage (accessed online November 2009).

California per capita water use map

http://www.ucan.org/water/water_conservation_efficiency/california_capita_water_use_map

California State Water Resources Control Board (SWRCB), Water Quality Criteria: Nitrogen & Phosphorus Pollution. SWRCB presentation website (accessed December 2009).

I. Key "Take Home" Messages II. History of the Nutrient Criteria Program III. Approaches for Nutrient Criteria Development IV. CA Nutrient Numeric Endpoint Framework V. CA NNE Regulatory Status VI. Klamath River NNE Case Study VII. Stream and Wetlands Policy –Protecting Physical Integrity

http://www.waterboards.ca.gov/academy/courses/wqstandards/materials/mod12/12nutn_pca.pdf

Diablo Canyon Power Plant, Pacific Gas & Electric NPDES Permit, Department of Toxic Substances Control web page (CAD077966349). State of California website (accesses December 2009).

Wastewater resulting from the treatment of liquid wastes may be discharged to the Pacific Ocean in accordance with the DCP National Pollutant Discharge Elimination System (NPDES) wastewater discharge permit. The wastewater is discharged into the facility once-through cooling water system that leaves the facility via the discharge structure into Diablo Cove. Such discharge will only occur after the wastewater has been tested to ensure that it does meet the discharge limits established in the Waste Discharge Requirements, Order number 90-09, NPDES Number CA0003751.

http://www.envirostor.dtsc.ca.gov/public/hwmp_profile_report.asp?global_id=CAD077966349

Feely, R.; Sabine, C.; Hernandez-Ayon, J.; Janson, D.; Hales, B., *Evidence for Upwelling of Corrosive "Acidified" Water onto the Continental Shelf*, Science 13 June (2008) (320) 5882, pp. 1490 - 1492.

The absorption of atmospheric carbon dioxide (CO₂) into the ocean lowers the pH of the waters. This so-called ocean acidification could have important consequences for marine ecosystems. To better understand the extent of this ocean acidification in coastal waters, we conducted hydrographic surveys along the continental shelf of western North America from central Canada to northern Mexico. We observed seawater that is undersaturated with respect to aragonite upwelling onto large portions of the continental shelf, reaching depths of 40 to 120 meters along most transect lines and all the way to the surface on one transect off northern California. Although seasonal upwelling of the undersaturated waters onto the shelf is a natural phenomenon in this region, the ocean uptake of anthropogenic CO₂ has increased the areal extent of the affected area.

<http://www.sciencemag.org/cgi/content/abstract/1155676>

Global Water Awards, Zurich Marriott Hotel - Monday 27th April 2009.

The Global Water Awards recognise what senior executives across the international water industry have acknowledged as the most important achievements of the past year. They are chosen by way of a free vote given to all subscribers to Global Water Intelligence, and Water Desalination Report, as well as to members of the International Private Water Association and the International Desalination Association.

<http://www.globalwaterawards.com/>

Pollutant Discharge Limits Set for California Offshore Oil

Non-sewage wastewater discharges: SAN FRANCISCO, California, September 17, 2004 (ENS) - The U.S. Environmental Protection Agency (EPA) has approved a final discharge permit for oil and gas offshore oil platforms located in federal waters off the coast of California.
<http://www.ens-news.com/ens/sep2004/2004-09-17-09.asp#anchor2>

Reclaimed water. Wikipedia online encyclopedia (accessed October 2009)

"Reclaimed water, sometimes called recycled water, is former wastewater (sewage) that has been treated to remove solids and certain impurities, and then allowed to recharge the aquifer rather than being discharged to surface water..."
http://en.wikipedia.org/wiki/Reclaimed_water#cite_ref-IWA_30-0

Recycled Municipal Water, Volume 2, Chapter 16 in California Water Plan Update 2005.

For many communities, an investment in recycled water could also provide other benefits: 1. Provide more reliable local sources of water, nutrients, and organic matter for agricultural soil conditioning and reduction in fertilizer use 2. Reduce the discharge of pollutants to water bodies, beyond levels prescribed by regulations, and allow more natural treatment by land application 3. Provide a more secure water supply during drought periods 4. Provide economic benefits resulting from a more reliable water supply 5. Improve groundwater and surface water quality and contribute to wetland and marsh enhancement 6. Provide energy savings; the use of recycled water as a local source offsets the need for energy-intensive imported water.
http://www.water.ca.gov/pubs/planning/california_water_plan_2005_update_bulletin_160-05_v2ch16-web.pdf

Resources for Research. On Pacific Institute webpage (accessed online November 2009).

Tools for researchers, journalists, and others who are studying the issues of freshwater resources, climate change, environmental justice, and globalization.
<http://www.pacinst.org/resources/>

Summary of Estimated Water Use in the United States in 2005. U.S. Geological Survey website (accessed December 2009).

About 410,000 million gallons per day (Mgal/d) of water was withdrawn for use in the United States during 2005. About 80 percent of the total (328,000 Mgal/d) withdrawal was from surface water, and about 82 percent of the surface water withdrawn was freshwater. The remaining 20 percent (82,600 Mgal/d) was withdrawn from groundwater, of which about 96 percent was freshwater. If withdrawals for thermoelectric power in 2005 are excluded, withdrawals were 210,000 Mgal/d, of which 129,000 Mgal/d (62 percent) was supplied by surface water and 80,700 Mgal/d (38 percent) was supplied by groundwater. // Water withdrawals in four States — California, Texas, Idaho, and Florida — accounted for more than one-fourth of all fresh and saline water withdrawn in the United States in 2005.
<http://pubs.usgs.gov/fs/2009/3098/>

United Nations Environment Programme, Division of Technology, Industry and Economics, Where Nutrients Come From and How They Cause Eutrophication. UNEP website (accessed December 2009).

There are many sources. All activities in the entire drainage area of a lake or reservoir are reflected directly or indirectly in the water quality of these water bodies. A lake or reservoir may, however, be naturally eutrophied when situated in a fertile area with naturally nutrient enriched soils. In many lakes and reservoirs wastewater is the main source since untreated wastewater or wastewater treated only by a conventional mechanical-biological methods still contains nitrogen (25-40 mg per liter) and phosphorus (6-10 mg per liter). Both nitrogen and phosphorus can be removed by well-known technology - phosphorus by addition of a chemical that precipitates phosphate through a chemical reaction, and nitrogen usually by biological means through micro-organism activity. Nitrogen costs more money and also, technically speaking, is more difficult to remove than phosphorus.
http://www.unep.or.jp/ietc/Publications/Short_Series/LakeReservoirs-3/3.asp

USGS Toxic Substances Hydrology Program, Definition of Eutrophication. USGS website (accessed December 2009).

Eutrophication is a process whereby water bodies, such as lakes, estuaries, or slow-moving streams receive excess nutrients that stimulate excessive plant growth (algae, periphyton attached algae, and nuisance plants weeds). This enhanced plant growth, often called an algal bloom, reduces dissolved oxygen in the water when dead plant material decomposes and can cause other organisms to die. Nutrients can come from many sources, such as fertilizers applied to agricultural fields, golf courses, and suburban lawns; deposition of nitrogen from the atmosphere; erosion of soil containing nutrients; and sewage treatment plant discharges. Water with a low concentration of dissolved oxygen is called hypoxic.
<http://toxics.usgs.gov/definitions/eutrophication.html>

Water Science for Schools, US Geological Survey, website (accessed October 2009).

Water uses in California in 2000 by percentage
<http://ga.water.usgs.gov/edu/gausage.html#HDR1>

Water Use Facts. USDA Forest Service, Pacific Southwest Region (website accessed October 2009).

Facts about water use.

http://www.fs.fed.us/r5/publications/water_resources/html/water_use_facts.html