SWAMP
Surface Water
Ambient Monitoring
Program

NUTRIENT STUDY – RUSSIAN RIVER (NORTH COAST REGION)

What is it?

At low to moderate concentrations, nutrients containing nitrogen and phosphorus provide an integral part of the health and integrity of a waterbody. Healthy nutrient concentrations foster algal growth, essential to a healthy stream ecology. In turn, algae provide the basis for stream food production as primary producers in the aquatic food chain. Algae also provide important habitat for invertebrates and other aquatic life within a waterbody. In fact, algae remain an important source of the dissolved oxygen necessary for aquatic life survival.

Algal productivity and density is maintained at healthy levels through a balanced variety of human influenced factors which include nutrient concentrations, water flow, temperature, stream channel configuration, riparian conditions, and the aquatic grazing community. All of these factors have been modified to a significant extent within the Russian River drainage. Such disturbance of this balance can lead to impaired water quality that does not support beneficial uses (e.g., aquatic life, recreation) within the river.

Excessive nutrient increases, especially in combination with other factors, can lead to cases of nuisance algal growth or blooms. These blooms in turn reduce dissolved oxygen and can negatively affect pH levels, thus affecting the aquatic life within the river. In this manner, algal blooms can negatively affect many of the beneficial uses of the river. Algal blooms can lead to depressed oxygen conditions in overnight or pre-dawn hours, which can be very stressful or even lethal to aquatic life. The altered pH of a waterbody from algal blooms, when coupled with elevated ammonia levels can also be toxic to aquatic life. In addition, nuisance algal blooms can affect the aesthetics and enjoyment of the river, leading to limitations on usage impacting the local economy. Finally, some algal species associated with algal blooms can produce toxins that

Location of the Russian River

are harmful or even potentially lethal to animals or humans. The California Nutrient Numeric Endpoints assessment framework considers each of these environmental health issues to assess the risk to beneficial uses from excessive nutrient loading.

The lower Russian River experiences algal blooms every year. At this time, little is known about the current nutrient loading and cycling in the Russian River. The purpose of this study is to evaluate the current nutrient conditions of the Russian River. This study will also look at the various nutrient constituents and any relationship between nutrient concentrations and algal growth and composition. This study is also consistent with the California Nutrient Numeric Endpoints assessment framework. This framework is included in the emerging state policy on nutrients and the management of water quality impacts.

Why is it important?

There has been an alarming increase in incidences of toxicity from blue-green algae species occurring throughout the State. The results of this monitoring study will provide valuable information to develop an understanding of the relationship between nutrients and algal growth and composition.

This monitoring effort provides critical information on human and environmental health issues that concern everyone. In addition, this monitoring was specifically designed to address local watershed concerns, including impacts to recreation, aquatic life, habitat, and drinking water beneficial uses.

How will this information be used?

The North Coast watersheds support multiple beneficial uses (e.g. drinking water, aquatic life, habitat, water supply and recreation). Data collected as part of this study provides background water quality information which is used in combination with other available data to assess water quality impairment for the Clean Water Act Sections 305(b) and 303(d) Integrated Report. This report assesses overall water quality within the north coast watersheds and also identifies impaired waterbodies (waterbodies not meeting their beneficial uses designations). The findings within this report also can help determine future program design by focusing resources toward identified priority concerns.

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