



BACKGROUND

2005 Environmental Status Report – Public update on the environmental health of the Columbia River from Hugh Keenleyside Dam to the Border

What is the Columbia River Integrated Environmental Monitoring Program?

Key stakeholders from government and industry formed the Columbia River Integrated Environmental Monitoring Program or CRIEMP in 1991 to assess the ecological health of the Canadian portion of the Columbia River between Hugh Keenleyside Dam and the US border. The primary objective of CRIEMP is to gather and share environmental information with the public, agencies, and industries in a coordinated and cost-effective manner. Partners now include all levels of government, local industry, First Nations, and non-government organizations from Canada and the US.

Why report on the Columbia River?

The Columbia River provides a myriad of benefits to the communities that rely on its extensive watershed. It supplies water for power, industry, recreation, irrigation, and drinking, and at the same time supports diverse communities of fish, wildlife, and other aquatic species. The challenge is to balance the many social and economic benefits the river provides with protection of the river ecosystem. Ongoing monitoring and reporting on the river environment is necessary to meet this challenge, and to maintain the long-term health of the river, our economies, our communities, and ourselves.

Study area from Hugh Keenleyside to US border

CRIEMP monitors the Columbia River from the Arrow Reservoir to the Canada-US border, a sixty-kilometre stretch of river referred to in this report as the Lower Columbia River. This stretch of the river is subject to many human influences, including:

- Large dams such as Hugh Keenleyside, Brilliant, and Waneta
- Industrial operations including Zellstoff Celgar, Pope and Talbot sawmill, and the Teck Cominco smelter
- Municipal wastewater discharges at Castlegar, Trail, and other smaller communities along the river
- Influence from tributaries including the Kootenay and Pend D'Oreille rivers
- Urban development and limited agriculture

An overview of changes and improvements in the river

CRIEMP has completed this Environmental Status Report to provide an overview of the changes and improvements within the study area since the early 1990s and to update the public on the health of the river since CRIEMP's last report was published in 1994. This latest update relies on the selected environmental indicators of water flow, water quality, sediment quality, productivity, and fish to assess the current health of the Columbia River. Indicators are compared to accepted environmental guidelines and scientific criteria.

Water quantity and total gas pressure (TGP) improvements

The force of water passing through dam spillways may increase levels of dissolved gases such as nitrogen and oxygen in the water, which contribute to total gas pressure (TGP). Elevated TGP may affect fish by causing gas bubble trauma, a condition that, in severe stages, may be fatal. Highest TGP levels occur when water is spilled from dams, usually during the peak of spring thaw when river flows are highest. Because gas levels do not dissipate quickly, TGP tends to increase progressively downstream when there are several dams on a system. TGP levels in the river have decreased since the early 1990s as a result of operational changes and upgrades at the dams and construction of the Arrow Lakes Generating Station at Hugh Keenleyside Dam.

Water quality index ranking greatly improved

For this report, information is assessed using the Canadian Water Quality Index, which is calculated by comparing the data to water quality objectives designed to protect water for aquatic life, drinking, and recreational uses. Water quality at Birchbank, located between Castlegar and Trail, has been rated as good to excellent since the early 1990s, which means that conditions are very close to ideal. Water quality at Waneta, located downstream of Trail near the US border, was rated as “poor to marginal” during the early 1990s, indicating that water quality was frequently impaired. Water quality rose to a “fair” ranking in the mid to late 1990s, and has been ranked as “good” for the last four years. Overall, water quality in the Lower Columbia River has improved greatly over the past decade. This trend is expected to continue as impaired sites are remediated and industries continue to improve their facilities and practices.

Sediment quality improved and outlook positive

CRIEMP partners collect and analyze metals and other compounds in sediments along the Lower Columbia River. Results of monitoring programs are compared with BC sediment quality objectives for the Lower Columbia River, which are limits established to protect the environment and human health. Monitoring results show that sediment contaminant levels downstream of industrial and non-industrial discharges have decreased since the early 1990s. As a result of changing industrial practices (improved effluent treatment system at Zellstoff Celgar, elimination of slag discharge at Teck Cominco), slag and fibre mat deposits are decreasing in size, although they may still have localized impacts. The improving trend for sediment contaminants is likely to continue in the Lower Columbia River given the ongoing erosion or burial of fibre mats and slag.

Productivity – nutrients, algae, benthic invertebrates

Productivity refers to the capacity of aquatic plants (algae) and animals (benthic invertebrates) to grow and reproduce and is a good indicator of change within aquatic ecosystems. Productivity in the Lower Columbia River can be affected by industrial and municipal discharges into the river and can also be influenced by flow regulation from dams. Under current conditions, localized effects on productivity downstream of some industrial, municipal, and other discharges into the river are expected. However, improvements in effluent quality continue to lead to smaller and less pronounced effects. The impacts of flow regulation from dams on productivity are expected to be studied further as BC Hydro's Water Use Plan is implemented. This plan looks at optimizing water use (including social and environmental uses) in the Columbia River and the upstream reservoirs within the constraints of power production and the Columbia River Treaty - the agreement between Canada and the United States to develop and share waterpower and storage facilities on the Columbia River

Outlook for fish

Fish are one of the most studied and visible indicators of river conditions, as they are economic, recreational, and ecological resources. At least 28 fish species are found in the Lower Columbia River. Although subjected to impoundment from dams and contaminants from various sources, most fish populations appear to be healthy and stable. The situation for white sturgeon is more tenuous and will depend on the success of the Upper Columbia White Sturgeon Recover Initiative, a coalition of American and Canadian stakeholders, to identify and address poor reproductive success. The increased walleye numbers (a non-native introduced species) is a concern as they impact native fish species through predation.

Links to community, emerging issues & challenges

A coordinated approach is necessary to address current and future river health. Monitoring information is best integrated with decision-making processes, and communities must be involved in decisions that affect the Columbia River. As such, public education and involvement are important in protecting the river as an ecosystem and resource. While CRIEMP partners deal primarily with well-defined industrial and municipal discharges and their effects, a variety of diffuse environmental impacts exist. These unregulated impacts arise from road and other surface runoff, storm water discharge, use of pesticides and herbicides, removal of bank vegetation and other watershed activities. Community awareness and action are important to limit and reduce impacts from such activities.

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