BC Environment
River Forecast Centre

Water Supply and Streamflow Conditions:
Issued: December 12, 2007

Winter has arrived, with a range of resultant streamflow conditions that occurs across a province as diverse and complex as British Columbia.

First, with the onset of cold weather over the past six to eight weeks, snowpacks have started to accumulate throughout most of the interior. Generally, by the second week of December, about one-third of the winter's snowpack has accumulated. This winter, so far, mountain snowpacks are very well developed. Some areas, such as the Columbia basin, northern portions of the Thompson and Upper Fraser basins, and the Skeena/Nass, have well above normal snowpacks for early December. Snowpacks in most of the rest of the province appear to be near normal. This substantial early season snow accumulation provides a favourable early outlook for water-supply conditions next spring. The first full snow survey of the season will be done for January 1st, 2008, and will be reported around January 10th.

Winter has also brought storms and flooding to some coastal areas. A very strong Pacific frontal storm pushed onto the South Coast over December 3rd and 4th, bringing very heavy rain to south and central Vancouver Island, the Greater Vancouver and lower Mainland area, and Howe Sound. In some areas, particularly on Vancouver Island and northern portions of the lower Mainland and the western Fraser valley, as much as 250-300 mm of rain was measured over the 36 hour duration of the storm. This warm front caused the freezing elevation to rise substantially, not only along the coast but through much of the interior. Temperatures at many locations rose as much as 10-15 degrees over 24 hours, from below freezing to well above freezing. This produced substantial snow melt throughout the Coast Mountains and Insular Mountains on Vancouver Island. The snowmelt water augmented the heavy rainfall, producing the high streamflow and, in some areas, flooding. This type of "rain-on-snow" flooding occurs along the British Columbia coast regularly, generally during the mid-October to mid-January period.

Last week's 3-4 day period of warm weather throughout the interior, following an extended period of cold weather, has produced another type of streamflow condition – ice jam flooding. In general, as temperatures are sustained at below freezing for some period of time in the early winter, rivers begin to freeze. Ice crystals, referred to as frazil, form at the surface of the water. The crystals coalesce and freeze into competent, thick ice on many interior rivers. A period of very warm weather, such as occurred last week, affects frozen rivers in a couple of ways. First, the warm weather produces some snowmelt, which can cause the water level on the river to rise. Second, the ice in the river warms and become pliable. The ice then fractures and begins to flow with the current of the river. Ice jams can occur at locations along rivers, such as bridge abutments, meander bends, shallow areas, constrictions, etc. Water then builds up behind the ice jams, and can produce local flooding. Ice jam flooding is occurring this week along the Nechako River at Prince George and the Bulkley River at Smithers, and likely at a number of other rivers throughout the Interior, but where populations are not being affected.