

MEMO TO: Dave Schafer CENAE-EOC, John Hasselman CENAN-OP-EM
SUBJECT: Late winter ice conditions on NH and Maine rivers
DATE: 17-18 March 2005

On 17-18 March 2005, Andy Tuthill checked ice conditions by air on the following rivers:

Androscoggin River: Berlin, NH to Lewiston-Auburn, ME
Sandy River: Farmington, ME to Kennebec confluence
Piscataquis River: Abbot, ME to Penobscot confluence
St. Croix River: Baring, ME to mouth
Narragaugus River, Cherryfield, ME
Kennebec River: Bingham, ME to Merrymeeting Bay
Saco River: Fryeburg, ME, Conway NH
Pemigewasset River: Plymouth, NH and upstream

Also, on 18 March, CRREL and MEMA personnel inspected ice conditions on the ground and installed an ice motion detector upstream of Memorial Bridge at Augusta.

The rivers over most of this region maintain nearly complete ice covers under relatively deep snow, with open few open leads visible. An exception is the Kennebec River, which is open for about 10 miles below Waterville instead of the usual 5-4 miles. This is good news since the less-than-normal upstream ice supply decreases the ice jam flood threat at Augusta.

The *Androscoggin River* ice cover is fairly typical for late winter. The channel is mostly open from the paper mills at Berlin and Gorham (Fig. 1) to a point about 10 miles above the sharp bend at Bethel, ME where ice jams often occur (Fig. 2). The tributaries including the Moose, Peabody and Wild Rivers still have extensive ice covers. Below Bethel the Androscoggin ice cover is complete to Rumford. Within this reach ice jams are common in the bends at Hanover and Rumford Point, but the breakup ice run rarely passes the Rumford. Below Rumford the river is open past Canton to the sharp bend at Jay (Fig. 3). With limited upstream ice supply the ice jam flood threat is minimal at Canton, which is good news. Below the dams at Livermore Falls, the Androscoggin is open for about 10 miles, then sheet ice covered all the way to the Gulf Island Dam above Lewiston.

The *Sandy River* is completely ice covered from above Farmington (Fig. 4) all the way to the confluence with the Kennebec below Madison. Ice jams and ice jam flooding could still occur at Farmington in the event of a major rainstorm.

The *Piscataquis River* is ice covered from above Abbot all the way to the Penobscot confluence near West Enfield. The potential for ice jams and ice jam floods exists at the traditional sites of Dover Foxcroft and Guilford (Fig. 5). Traveling eastward, the snow cover over the ice becomes increasingly consolidated as result of recent snowstorm, which fell as rain and caused some ice jams near the coast.

The *St. Croix River* is open from below the Dam at Woodland, past Baring and Calais. No evidence remained of the reported 8 March ice jam at Baring.

Above the ice control dam near Cherryfield, the *Narragausus River* is covered in intact gray sheet ice. On 8 March, the ice below the structure had broken up and jammed against the sheet ice on the flat tidal portion of the river below the village causing minor flooding. Much of this ice jam appeared to have melted out in the intervening 10 days (Fig. 6).

The *Kennebec River* is covered in smooth snow covered ice from a point about 4 miles below Madison to the Shawmut Dam above Fairfield. Above Madison, the river is ice covered for about 3 miles then open up to Flagstaff Dam at Bingham. This structure holds back the break ice run for all the most extreme flows while the lower Kennebec dams pass ice during most breakups. Below the Shawmut dam, the river is open for 4 miles to the islands at Fairfield, and then ice covered to the lowest dam at Waterville (Fig. 7). The Sebasticook is completely ice and snow covered with the exception of a 2000-ft-long open lead below the Benton Dam. Below Waterville, the Kennebec is open for about 10 miles, to a point about 1 mile downstream of the Sydney boat launch (~8 miles upstream of Augusta) (Figs. 8 & 9). Based on observations from past years, one would expect significantly more ice cover between Waterville and Augusta at this time. The ice cover through downtown Augusta is smooth-surfaced this year (Fig. 10), compared to the rough-surfaced freezeup ice jam that typically forms here since the removal of the Edwards Dam. Below Augusta, the Kennebec is covered in smooth sheet ice past Gardener and Richmond and through Merrymeeting Bay. There is no evidence of USCG ice breaking activity below the Richmond Bridge.

On the morning of 18 March, I met Jesse Stanley of CRREL to install an ice motion detector upstream of the Memorial Bridge at Augusta. We were assisted by Gene Maxim and Randy Rolfe of MEMA. The lack of ice at the Sydney Boat Launch prevented us from placing a second detector there as planned. In the downtown Augusta reach we measured 22-inch-thick ice 80 ft out from the shore and 180 ft out we measured 40 inches of hard gray ice beneath 12 inches of dense snow. Beneath the hard ice is thick frazil slush. had domed up the ice cover in the central portion of the channel. Upstream at the open leads near the railroad bridge, the fast moving water appeared to be weakening and melting the ice cover at a rapid rate.

When the ice goes out, the ice motion detector will call the following numbers:

| | |
|------------------------|---|
| 207-632- 3614 ext. 200 | Kennebec County Dispatch |
| 207-626-2375 | Augusta Fire Dispatch |
| 207-688-3224 | National Weather Service River Forecast Center Grey, ME |

The padlock combination of on the box is: 29-07-37.

On the return flight to Lebanon, I inspected the *Saco River*, which is ice mostly covered with the exception of a 4-mile-long open section below the Fryeburg Airport. The *Pemigewasset River* is mostly ice covered upstream of the historic ice jam locations at Plymouth NH, so some ice jam flood potential still exists in this area.

Conclusions

For the next week, the forecast in northern New England is for partly to mostly cloudy, with highs in the 40's and night-time lows in the 20's. The essential ingredient for dynamic ice breakup at this point would be rain, and none is forecast. Under the expected weather conditions, the ice covers on the rivers will melt gradually and ice jam flood threat will continually decrease.

Respectfully Submitted,

Andrew M. Tuthill, P. E.
Ice Engineering Group
Remote Sensing/ GIS Branch
US Army Engineer Research and Development Center
Cold Regions Research and Engineering Laboratory
72 Lyme Rd.
Hanover, NH 03755

603-646-4225 phone 4477 fax



Fig. 1. Open water on the Androskoggin River at Gorham, NH.



Fig. 2. Ten miles of ice on the Androskoggin River upstream of Bethel, ME.



Fig. 3. Androskoggin River open near Canton, ME.

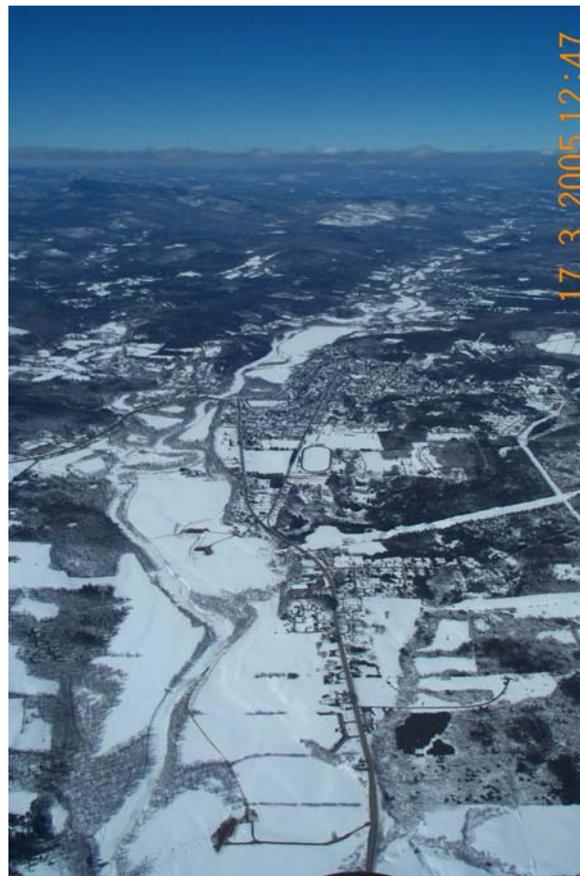


Fig. 4. Sandy River looking upstream towards Farmington, ME.

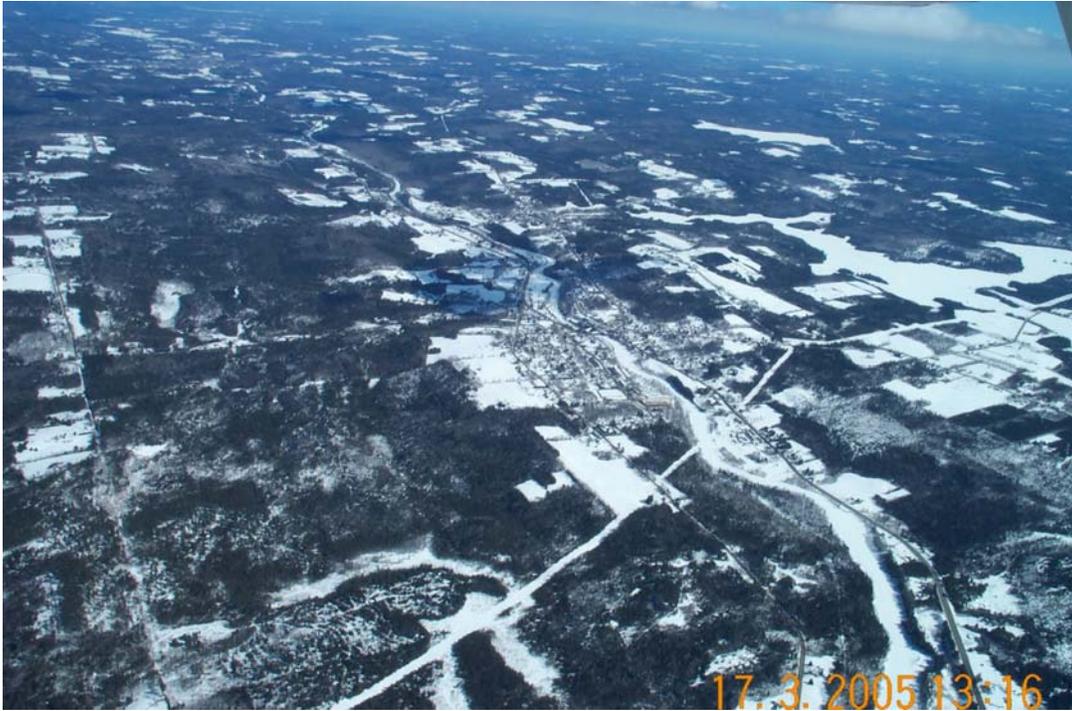


Fig. 5. Piscataquis River completely ice covered near Guilford ME, looking downstream towards Dover Foxcroft.



Fig. 6. Narragausus River at Cherryfield, ME.



Fig. 7. Kennebec River at Waterville, ME



Fig. 8. Kennebec River open for 10 miles below Waterville.



Fig. 9. Kennebec River at Augusta looking downstream.



Fig. 10. Kennebec River through downtown Augusta.



Fig. 11. Pemigewasset River at Plymouth NH, looking downstream.

