

# 25<sup>th</sup> Anniversary Montpelier Ice Jam March 11, 1992

## Weather Synopsis:

After a light snowfall on March 1<sup>st</sup>, there was 10" of snow on the ground in Montpelier, VT. Mild daytime temperatures beginning on the 3<sup>rd</sup> of March melted away some of the snow each day, with only 2" remaining on March 10<sup>th</sup>. There was still considerable snow cover in the higher elevations of the Green Mountains. Data from an unpublished USGS report reported 18" snow depth with 5" of snow water equivalent at 1,300' in the headwaters of the Winooski River basin on March 3<sup>rd</sup>. On the morning of March 10<sup>th</sup> a low pressure system was centered near Toledo, OH (Figure 1). Vermont was in the warm sector ahead of this system and the city of Montpelier recorded a maximum temperature of 44 degrees. Late Tuesday evening rain showers began as this low pressure system tracked eastward. By midnight, 0.24" of rain had fallen in Montpelier.

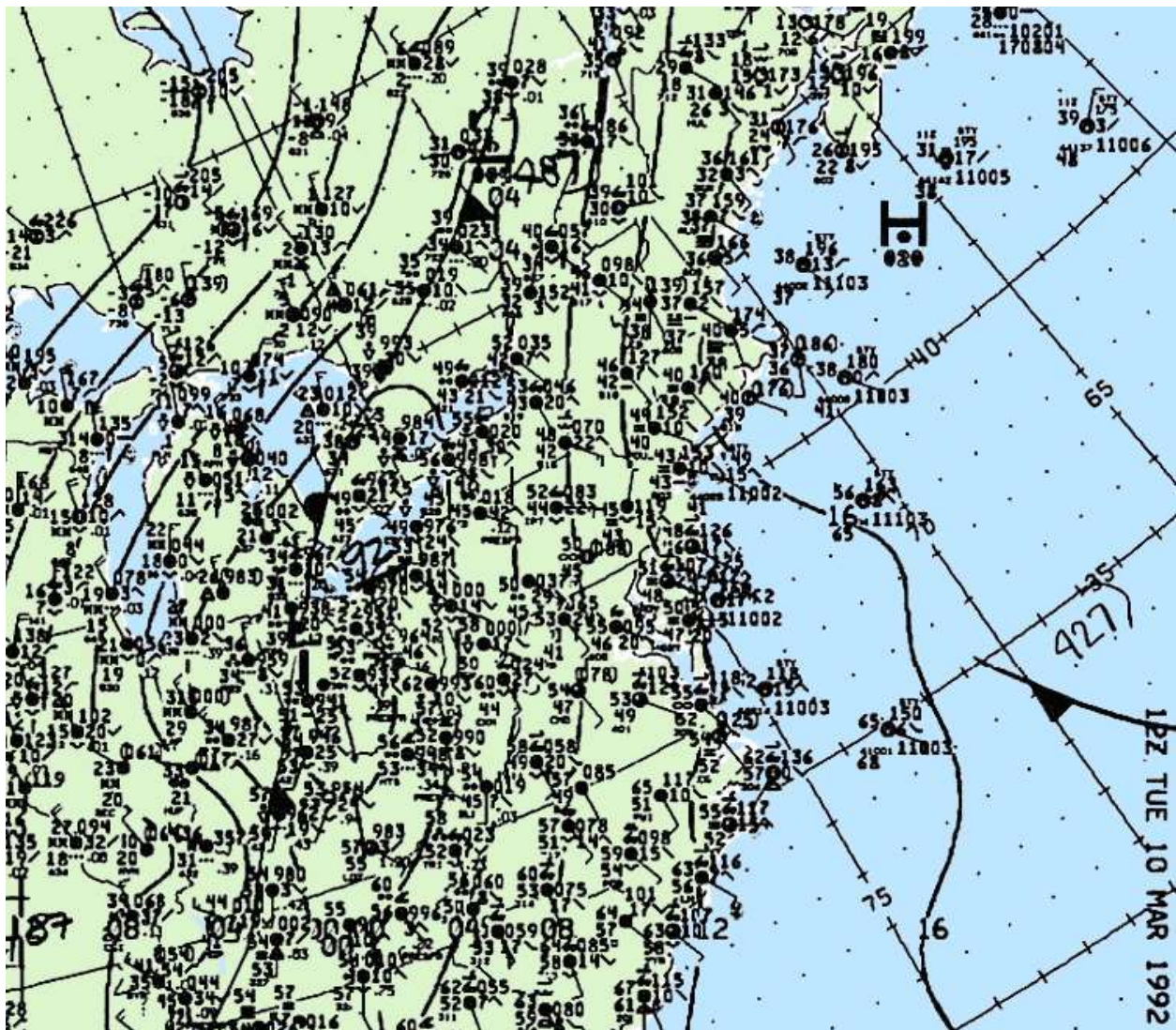


Figure 1: WPC Surface Archive Page - 12z (7am EST) Tue 03/10/92

The rain continued overnight as aforementioned low pressure system was centered over Eastern Pennsylvania by Wednesday morning (Figure 2). At 6am on the 11<sup>th</sup> there was about 0.60" of rainfall in Montpelier. An early daytime high temperature of 51 degrees was reached and all remaining snow on the ground melted adding to the runoff. During the daytime hours this low pressure system lifted northeastward across Vermont. Another 0.22" of rainfall would fall, with rainfall totaling over 1" in Montpelier before changing to snow.

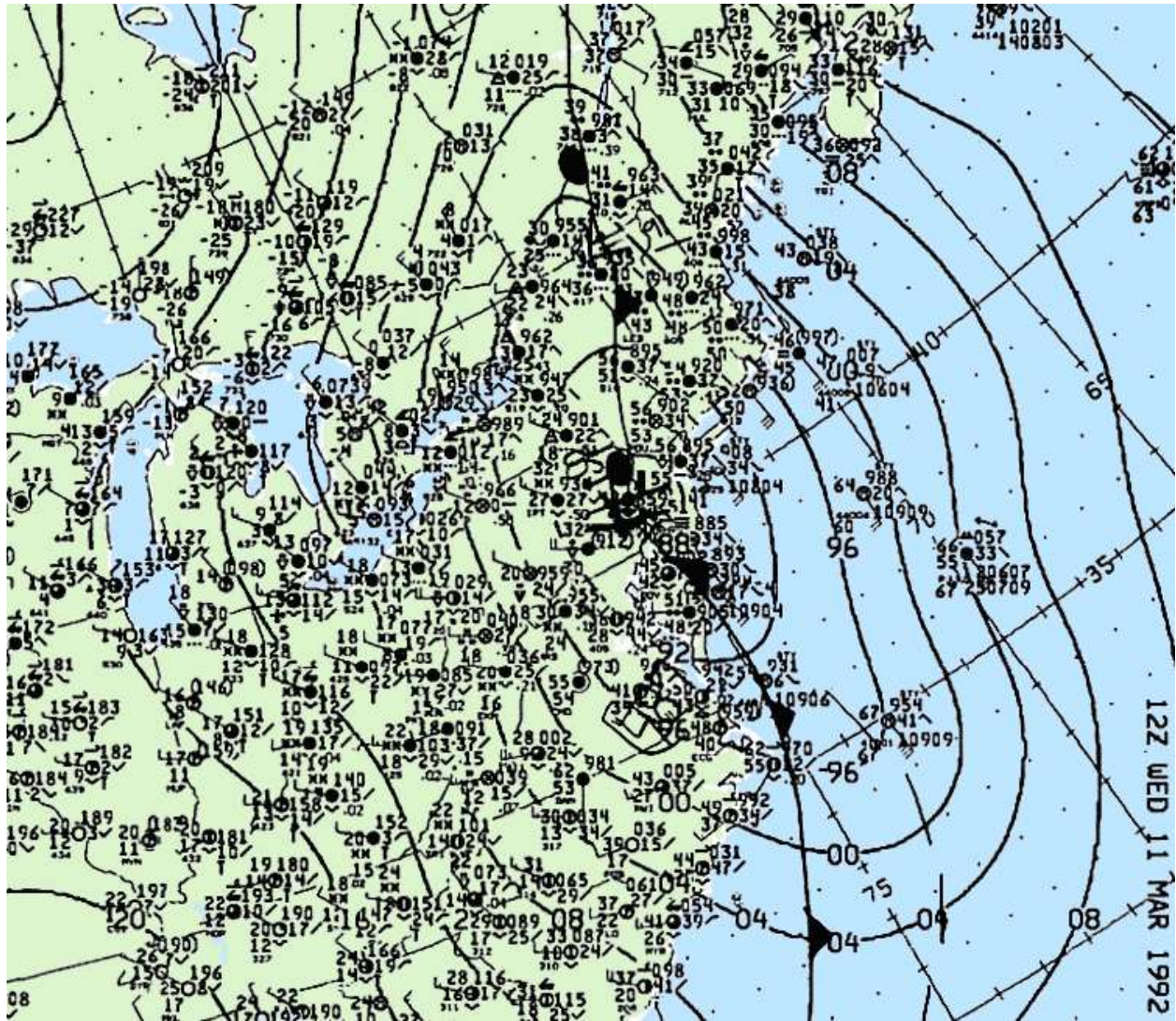


Figure 2: WPC Surface Archive Page - 12z (7am EST) Wed 03/11/92

Table 1: Climatological Data for Mar 1-12, 1992 Barre Montpelier Airport, VT

Date	Max Temperature	Min Temperature	Avg Temperature	Avg Temperature Departure	HDD	CDD	Precipitation	Snowfall	Snow Depth
1992-03-01	21	-8	6.5	-17.0	58	0	0.08	2.4	8
1992-03-02	24	-4	10.0	-13.8	55	0	T	T	10
1992-03-03	40	10	25.0	0.9	40	0	T	T	10
1992-03-04	37	9	23.0	-1.4	42	0	0.00	0.0	7
1992-03-05	43	15	29.0	4.3	36	0	0.00	0.0	5
1992-03-06	43	23	33.0	7.9	32	0	T	T	5
1992-03-07	36	28	32.0	6.6	33	0	0.13	0.0	4
1992-03-08	40	32	36.0	10.3	29	0	T	0.0	3
1992-03-09	48	31	39.5	13.4	25	0	0.00	0.0	3
1992-03-10	44	37	40.5	14.0	24	0	0.24	0.0	2
1992-03-11	51	16	33.5	6.7	31	0	0.82	0.3	T
1992-03-12	18	6	12.0	-15.2	53	0	0.14	1.3	M

### Ice Jam Flooding:

Local police first reported an ice jam near the Washington County Railroad Bridge, which is west of the Pioneer St Bridge (Figure 3). This initial jam released, but as the ice and water surged downstream it caused another jam near the Bailey Ave Bridge. The first flood warning was issued around 7:20 am. Water surged into downtown Montpelier as it backed up due to the jam. Within less than an hour, downtown Montpelier was inundated to a depth of 2-5 feet. The Governor of Vermont declared a state of emergency by 9 am, and evacuations continued through the morning hours. Around 3 pm, backhoes and a crane were staged to attempt to dislodge the jam below the Bailey Ave Bridge. The ice was dislodged and began flowing, but caused a secondary ice jam, exacerbating flooding in downtown Montpelier. The ice jam was once again knocked loose and as huge chunks of ice moved downstream, the railroad bridge downstream from the Bailey Ave bridge was ruined. By 5:30 pm the last ice cleared the bridge and flood waters quickly drained from the downtown area. As the ice jam released, the peak stage was 15.71' (Figure 4). The corresponding maximum discharge was 11,500 cubic feet per second, this has a recurrence interval of about 10 years (10-percent chance in a given year.) In comparison, the maximum gage height during the flood of 1927 was 27.1', which has a recurrence interval of greater than 100 years. The duration of flooding downtown was about 11 hours. When the jam released the water receded very quickly. The arrival of sharply colder temperatures reduced runoff and lessened the potential for further flooding.

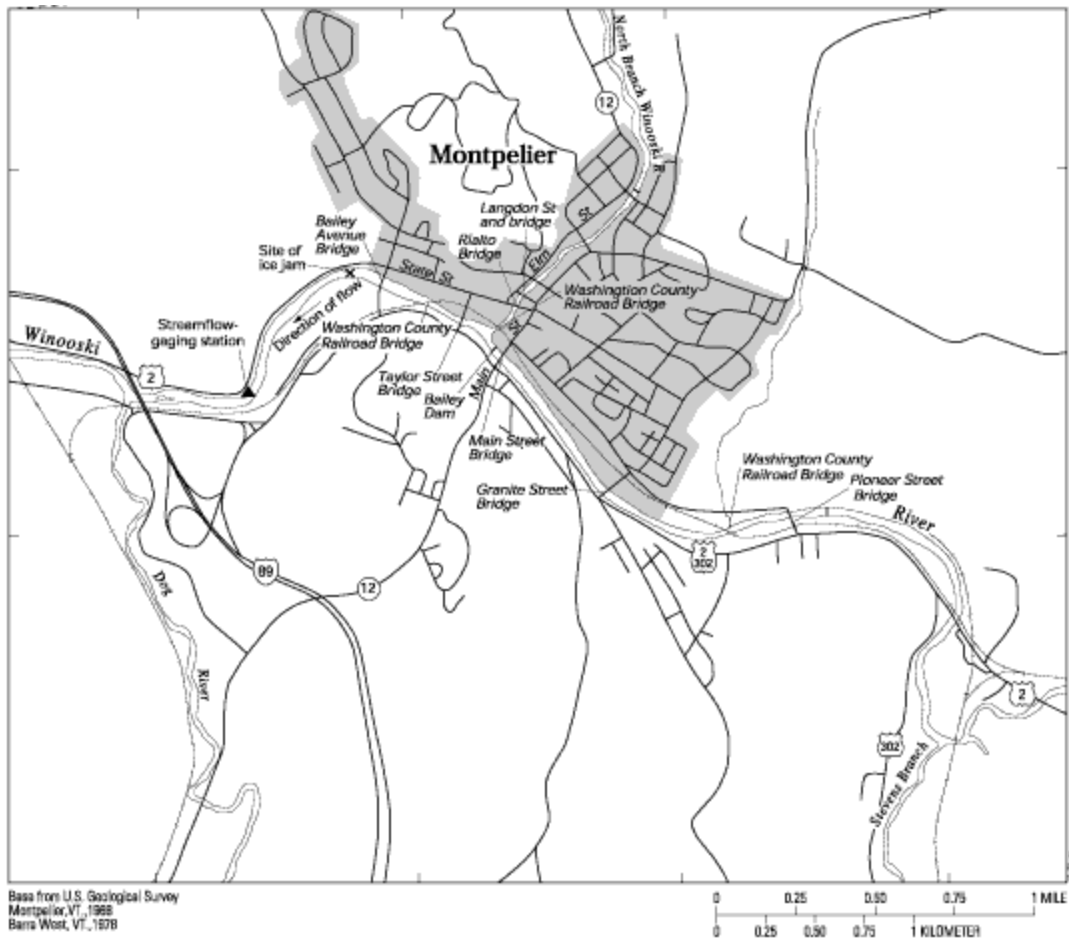


Figure 3: Location of the Winooski River, North Branch Winooski River, and Stevens Branch in Montpelier, VT (USGS)

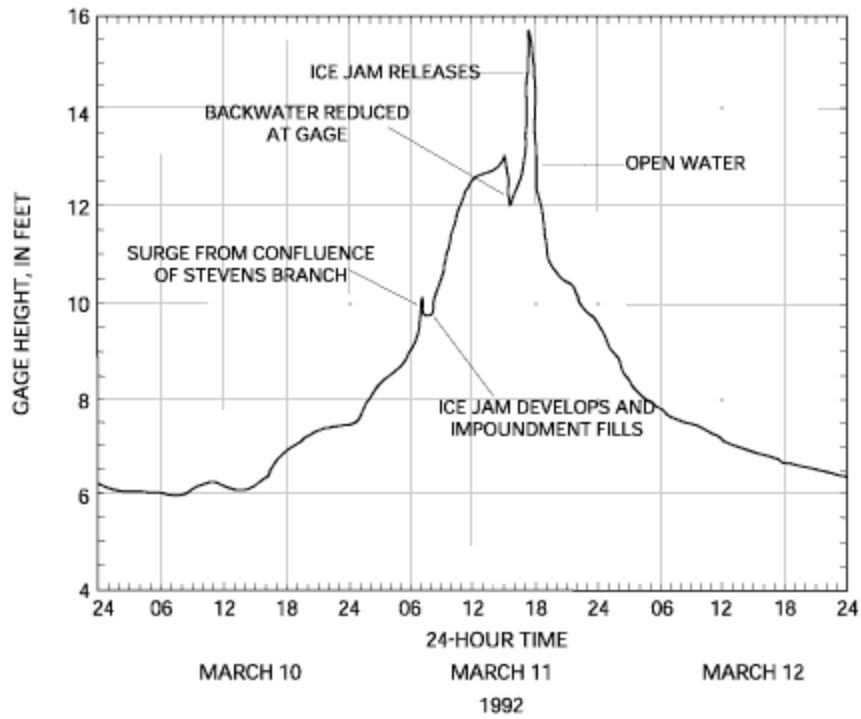


Figure 4: Gage height, Winooski River at Montpelier, VT (source: USGS)

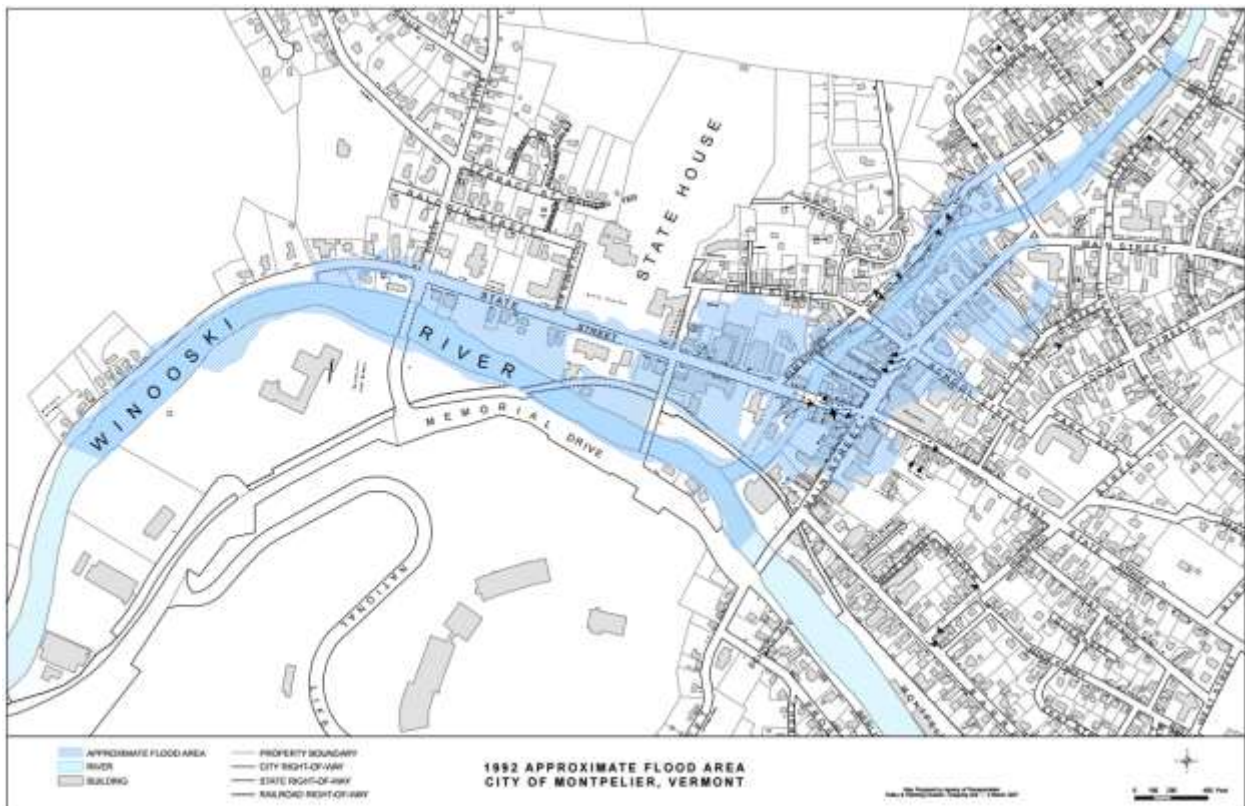


Figure 5: Approximate Flood Inundation Area, City of Montpelier VT

### **Wednesday, March 11, 1992**

- 6:57 a.m.** A large ice jam on the Winooski River breaks loose about the Pioneer Street Bridge and travels through Montpelier. Ice jams just below the Bailey Avenue Bridge and dams the river.
- 7:05 a.m.** Filled with rain and snowmelt, the Winooski begins to overflow its banks along State Street and the North branch begins backing up onto Elm Street.
- 7:15 a.m.** Water surges dramatically into low-lying areas behind Main and State Streets, floating propane tanks from moorings, flooding parked cars and inundating store basements.
- 7:23 a.m.** Radio stations are notified of a flood emergency as first warnings are issued.
- 7:45 a.m.** Icy flood waters hit the steam heating boiler at MacPherson's Travel on Main Street and the boiler explodes, shattering the glass storefront and destroying the basement.
- 7:56 a.m.** Two to three feet of water is reported in front of Days Inn on State Street where an estimated 100 people are stranded. Flood waters pour onto Main Street, stalling cars and making the road impassable. Backed-up water from the swollen North Branch flows upstream on Elm Street.
- 8:09 a.m.** Evacuations begin of hundreds of stranded residents, workers and state employees on Main, State and Elm Street. Some wade to safety, while others are taken out by boat or by fire engines and dump trucks.
- 8:30 a.m.** Gov. Howard Dean declares a state of emergency in the capital and closes state offices. The National Guard is called in to assist, and state police, game wardens and other public safety crews begin arriving to help in the disaster.
- 8:46 a.m.** A Red Cross emergency shelter is set up at the gymnasium at Vermont College.
- 9:00 a.m. to noon** Human chains of volunteers work successfully in frigid waters to save historic documents stored in the basement of the Pavillon Building. On Main Street, similar efforts rescue about 18,000 children's books from the basement of Kellogg-Hubbard Library and thousands of videotapes in the basement of the Savoy Theater.
- 10:07 a.m.** Power crews shut off electricity in downtown Montpelier because of high fire and explosion hazards from leaking fuel oil and propane. Many telephone lines are out. About 200 buildings in the downtown area are flooded.
- 3:00 p.m.** Backhoes and a crane move into place and begin dislodging the ice jam below Bailey Avenue Bridge.
- 4:57 p.m.** After getting the ice flowing, a second jam occurs, sending a surge of water back up into Montpelier to cause the worst flooding of the day.
- 5:10 p.m.** The ice jam is knocked loose again, and begins moving downstream.
- 5:17 p.m.** Huge ice chunks grinding downriver lift and twist half the trestle railroad bridge near Bailey Avenue off its foundation, leaving it perpendicular to the rest of the bridge and pointing downstream.
- 5:31 p.m.** The last ice clears the Bailey Avenue Bridge, and flood waters rapidly drain from downtown.

Figure 6: Timeline from City of Montpelier

### **Flood Damage:**

The downtown commercial district of Montpelier suffered severe damage as water levels rose to 2 to 3 feet above the main-level floors in many businesses. Buildings, streets, sidewalks, and a railroad bridge were damaged. Cleanup efforts were hampered by extremely cold temperatures and light snow. It was important to pump out basements and repair heating units quickly because the subfreezing temperatures could further damage properties. More than 200 automobiles were damaged or destroyed. Petroleum spills caused pollution and safety hazards. FEMA estimated that 8,000 gallons of fuel oil were discharged into the floodwater. In the city of Montpelier the ice jam flood caused estimated \$4 million damage. The President of the United States declared the flood affected counties a disaster area. No deaths or serious injuries were reported.

**Photos from City of Montpelier Website:**

Some of the formidable ice chunks that clogged the Winooski.



Megan W. Picard

Canoers on Main Street



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A view of the ice and the still intact railroad bridge from the Taylor Street bridge.  
Ice chunks on the Winooski River

George W. Wood

A backhoe works to break up the ice jam at the Bailey Avenue Bridge.



Ethel Grandfield



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Ice chunks under Main Street Bridge



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The pressure of the ice and water causes the Washington County Railroad bridge to snap.

Jackie Hurlburt

## References:

City of Montpelier website

<http://www.montpelier-vt.org/604/Flood-of-1992>

Denner, Jon C. and Robert O. Brown USGS Summary of Floods of 1992

<https://ks.water.usgs.gov/pubs/reports/wsp.2499.sumvt0392.html>