



# The River Watch Program: Monitoring the Spring Breakup of Alaska's Rivers from Above



John Dragomir, MIC WFO Fairbanks and Robin Radlein, HIC Alaska-Pacific RFC

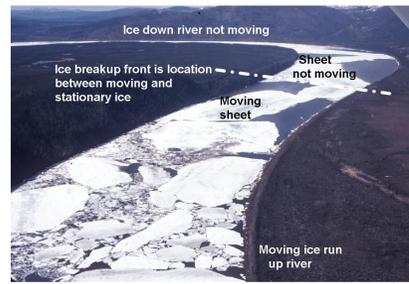
## Background

Flooding associated with the spring breakup of ice on Alaska's rivers is an annual event. The severity of flooding varies from year-to-year depending on such variables as river ice thickness, snow water equivalent of the winter snowpack, spring-time temperatures, and local river channel morphology. The majority of Alaska's non-coastal communities are situated along rivers which dissect the state. Breakup flooding is not only a common threat or occurrence in many of these communities each spring, but flooding in response to ice jamming is expected each season along Alaska's extensive network of rivers.

In anticipation of flooding due to ice jams and/or spring snowmelt runoff, the National Weather Service (NWS) has developed a close partnership with the state of Alaska to monitor ice and river conditions along several major rivers for the duration of the river breakup cycle. Due to the remote nature of the state, lack of a dense observational network, and uncertainty of breakup flooding, the NWS relies heavily on aerial observations to assist with the forecasting of breakup flooding. The River Watch Program was established in order to improve the NWS's ability to provide accurate and timely hydrologic Watches/Warnings/Advisories for flooding in response to river ice breakup.

## Cooperation with the State of Alaska

The National Weather Service (NWS) has assisted the Alaska Division of Homeland Security and Emergency Management (DHS&EM) with the monitoring of breakup along the Yukon and Kuskokwim Rivers for more than 30 years. The NWS and DHS&EM charter a flight to follow the "breakup front" for the entire length of the Yukon and Kuskokwim Rivers during the spring.



It can take more than 3 weeks for the "breakup front" to proceed 1,200 miles down the Yukon River from the Alaska-Yukon border to the mouth at the Bering Sea. Ice jams are common and significant flooding often occurs just upstream of the breakup front.

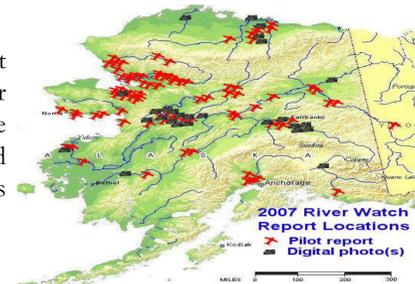
NWS hydrologists analyze river ice conditions during the River Watch flights to determine if a flood Warning is necessary. The hydrologists will land in the villages and brief emergency officials on whether to expect flooding, the severity of flooding, or when an ice jam is expected to release and water levels will recede.



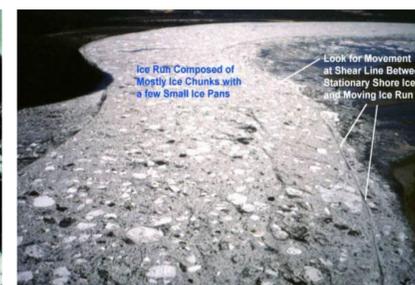
## Volunteer Eyes in the Sky

The NWS in Alaska has developed an extension to the state of Alaska funded River Watch program which utilizes the eyes of local air taxis, other government agencies, and general aviators. This expanded volunteer River Watch program allows the NWS to gather information about pre-breakup, breakup, and post breakup conditions on many rivers around the state. This pre-to-post breakup information is generally not available while only flying the breakup front.

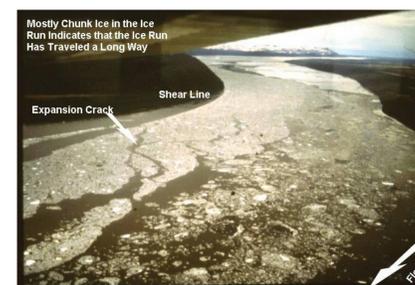
Most scheduled flights to villages fly at low altitudes and along the river corridors. Local air taxis provide the NWS with observations and photographs of river ice conditions across the state during spring breakup.



The river ice information collected by the volunteer pilots and NWS River Watch hydrologists allow the NWS to provide a more accurate summary of the spring breakup across the state of Alaska.



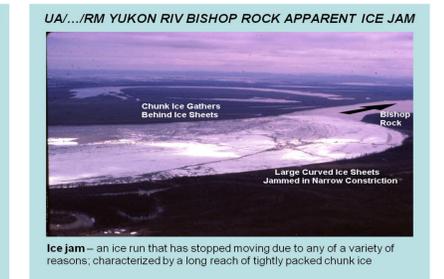
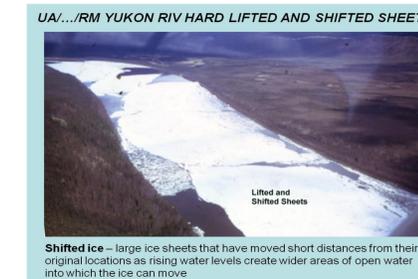
The NWS provides river and ice observation training each spring to local air taxis, government agencies flying small aircraft, and general aviation pilots.



The NWS has developed a standard terminology for observing river and ice conditions in order to ensure that all observers are speaking the same language.

## Ice Observation Dissemination

River and ice observations which are collected by pilots are coded in the remarks section of an aviation Pilot Report (PIREP). The Alaska Flight Service Station (AFSS) staff have been trained to receive, code, and transmit these hydrologic PIREPS. The NWS receives the PIREPS in the same manner as the those transmitted by the aviation community to report weather conditions.



The river and ice conditions are reported in the remarks (RM) section of a PIREP. The PIREP will include the characters "RIV" in order to be flagged by the NWS as containing hydrologic information.

## 2009 Breakup Flooding

The spring 2009 breakup along the Yukon and Kuskokwim Rivers resulted in the most destructive flooding in many decades. Aerial reconnaissance by the NWS River Watch team helped emergency officials determine if evacuations were necessary. Communities made preparations to deal with high water and major flooding based on NWS Warnings which were issued due to observational information gathered during the River Watch flights.



The Yukon River village of Eagle experienced the worst flooding on record. The river ice crushed homes and lifted many structures from their foundations.



Residents expressed sincere gratitude towards the NWS and claimed that the timely Warnings from the River Watch hydrologists saved property and lives.