



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

# Ice Accumulation

## ■ Addressing the risks of ice from freezing spray on vessel stability

### The problem

**Icing can dangerously degrade a vessel's stability.** The NTSB investigated an accident in which the fishing vessel *Destination* likely capsized at night in rough seas and gale force winds due to topside ice accumulation. The vessel was transiting through the Bering Sea to St. Paul Island in heavy freezing spray conditions that were forecasted by the National Weather Service. The vessel and all hands were lost without a mayday call.



Ice accumulation on a vessel operating near the capsized vessel that was lost with all hands in the Bering Sea on February 11, 2017. (1, 2, and 3) *Polar Sea*: ice covers the decks and anchor chain during the vessel's transit to St. Paul Island on February 10 and remains on the wheelhouse while it was docked at the island the following day.

### The solution—what mariners can do

During winter months, consult the [National Weather Service's](#) freezing spray forecasts and plan transits and fishing operations accordingly to decrease the risks of hazardous conditions.

#### **Should your vessel be exposed to freezing spray conditions, consider the following precautions:**

- Decrease the number of pots on board or other gear above the main deck to reduce the available surface area for accumulating ice. These measures also serve to lower the vessel's center of gravity, thereby increasing its stability margin prior to encountering icing conditions.

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- Cover deck loads/pots with tarps to shed water.
- Lessen exposure to high seas and winds:
  - Reduce speed
  - Change heading
  - Seek shelter, such as a lee behind land mass
  - Remove ice manually (break ice).
 See “Mitigation and Avoidance of Vessel Sea Spray Icing” in [Mariners Weather Log](#).
- Develop procedures and schedules for crewmembers to break ice and navigate during freezing spray conditions.
- Ensure that your vessel is fitted with proper equipment to break accumulated ice. See “Ice and Snow Removal Methods” in [Mariners Weather Log](#).
- Ensure that crews are rested and prepared to operate in freezing spray conditions.
- Understand your vessel’s stability information:
  - Ensure that the vessel is operating below the limits set in the stability information and that the vessel’s arrangement, equipment, and operation closely match the conditions listed in the stability information.



Ice accumulation on vessels operating near the capsized vessel *Destination* that was lost in the Bering Sea. (4) *Bering Rose*: accumulation of ice on deck aft of the wheelhouse on February 11. (5) *Sandra Five*: crewmembers examine ice while in King Cove, Alaska, on February 12.



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