Narration:

Slide 1: Hi Folks. I’m sorry I couldn’t be with you in person for this presentation. I hope these few slides help you understand the interesting phenomenon of Ice-Push Ridges along northern lakeshores.

Slide 2: Here we have the process in a nutshell! Ice forms over winter, experiencing cracking and refreezing. Under spring diurnal temperature variations, above and below freezing, the ice expands. The ice mass cracks and freezes under low temperatures, and expands when the temperature rises. Under the right conditions of beach slope and material, the expanding ice pushes the unconsolidated shoreline sediments into a ridge.

Slide 3: Here are some prominent ice-push ridges on the north shore of Harding. These three ridges, A, B, and C, were mapped by Mendenhall and Boutet in 1978.

Slide 4: Here’s a shot of an ice-push ridge that contains a survey marker dated 1936. Review of the original survey notes documents that this marker has been moved approximately 16 ft back from the original 1921 and 1936 lakeshore locations! Since the State of Alaska documented the original location with “witness trees” in 1961, we might conclude that this ice-push ridge formed sometime after 1961.

Slide 5. Here’s a diagrammatic layout of the previous situation.

Slide 6. Here’s an example of ice action off the south shore of Harding lake in 2008. On May 15th the stilling well (standpipe) was off shore and the recording equipment housing was in its normal upright position on shore. On May 20th the ice had pushed over the equipment housing and pushed the standpipe (embedded in a concrete block) up onto the shore.

Slide 7 – 12 The next several slides illustrate the ways lake ice cracks. Crack are important in that they fill with water, refreeze, and expand the ice mass.

Slide 13: Here’s a recap of the processes and conditions resulting in ice-push ridge formation. It’s referred to as the “ice ratchet” process and is accentuated when there’s little spring snow cover and strong diurnal temperature fluctuations (note the temperature record for April 2016 at the bottom of the slide).