Coastal Flooding in Golovin, Alaska, following the November 2011 Bering Sea Storm

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Five overview images of Golovin during the flood appear in chronological order to the right →

Lower portion of Golovin
~11:30 am 11/9/11
Photo by Debbie Anungazuk

Lower portion of Golovin
~2:00 pm 11/9/11
Photo by Debbie Anungazuk

Lower portion of Golovin
4:15 pm 11/9/11

Photo by John Peterson

Lower portion of Golovin
4:15 pm 11/9/11
Photo by John Peterson

Highest water in front of school
5:00 pm 11/9/11
Photo by Rachel Olson

On November 8, 2011, an extra-tropical cyclone with a low pressure of 945 millibars developed over the Bering Sea and moved northeast across the western coast of Alaska. This severe low-pressure system brought high winds and a large storm surge to the entire Norton Sound region. This storm caused extensive flooding in the lower portion of Golovin on the afternoon of November 9, 2011.

Overview Map of Norton Sound

A team of Alaska Division of Geological & Geophysical Surveys (DGGS) scientists visited Golovin on November 15, 2011, to document peak water levels, runup elevations, and inundation extents caused by this event. This map summarizes the extent of the November 9, 2011, flooding and was created from DGGS measurements of flood indicators in combination with elevations on the 2004 Alaska Department of Commerce, Community & Economic Development (DCCED) community map and photographs taken by local residents during the storm. General flow directions are based on eyewitness accounts and a vertical model of static inundation to the elevations presented on the DCCED map. Approximate times of inundation in different parts of the community are based on the timestamps of the photographs that were provided by residents. A draft version of this map was reviewed by community members for accuracy and to resolve gaps in observed inundation extents as well as discrepancies between 2004 DCCED elevations and present-day conditions. The DGGS team would like to extend their deepest gratitude to all of the community members who took the time to share their videos, photographs, and observations and to those who provided the feedback that improved this map.

For additional information on the content of this map and a discussion of the inferred elevation of the storm tide in Golovin, please see the accompanying DGGS report.

Elevations and Descriptions of Flood Indicators Measured in Golovin on November 15, 2011

Point Number	Measurement Type	Confidence level	Elevation in Meters (NAVD88)	Description
GLV_14	Inundation limit	Lowest	3.18 ±0.58	Slush line near the corner of the school (modified)
GLV_18	Inundation limit	Lowest	3.27 ±0.58	Elevation of tension cracking in snow surface near road
GLV_15	Inundation limit	High	3.58 ±0.60	Truncated snow and slush line along raised Antone Street
GLV_13	Inundation limit	High	3.66 ±0.59	Slush line visible on dike surrounding tank farm
GLV_17	Inundated area	High	3.78 ±0.59	Location of overflow across the road to low-lying area
GLV_04	Inundation limit	High	3.93 ±0.66	Slush line near sewer drain field (minor snow cover)
GLV_02	Inundation limit	Lowest	4.02 ±0.58	Transition in slush surface near the old runway
GLV_05	Inundated area	Medium	4.07 ±0.59	Slush-covered area near sewer drain field
GLV_09	Inundation limit	Medium	4.10 ±0.58	Slush line along a berm that was raised up in 2008
GLV_26	Inundated area	High	4.02 ±0.66	Area by homes that were surrounded with water
GLV_01	Inundation limit	Medium	4.12 ±0.58	Slush line along road near generators; ice present
GLV_11	Inundated area	Medium	4.11 ±0.61	Slush-covered area by water holding tank (modified)
GLV_23	Inundated area	Medium	4.16 ±0.57	Low-lying portion of road that was flooded (modified)
GLV_27	Inundation limit	Lowest	4.19 ±0.57	Slush line along the road near Dexter Roadhouse
GLV_20	Inundation limit	Lowest	4.20 ±0.57	Slush line along hillside edge of a low-lying area
GLV_12	Inundation limit	Medium	4.22 ±0.58	Slush line between school and the tank farm
GLV_24	Inundation limit	Lowest	4.27 ±0.58	Elevation of tension cracking in snow surface along road edge, exact slush limit obscured by road clearing
GLV_19	Inundated area	Medium	4.32 ±0.58	Location of overflow across road into low-lying area
GLV_16	Peak flood level	High	4.32 ±0.60	Water level as preserved on the sides of a soil fill pile between Antone Street and the small craft harbor fence
GLV_28	Inundation limit	Medium	4.42 ±0.58	Slush line on a mound near road at Dexter Roadhouse
GLV_07	Inundation limit	Medium	4.46 ±0.58	Slush line on side of earth foundation below hangar
GLV_08	Inundation limit	High	4.44 ±0.60	Elevation of tension cracking in snow surface
GLV_21	Inundation limit	Medium	4.49 ±0.57	Slush line along hillside edge of a low-lying area
GLV_03	Inundation limit	Lowest	4.56 ±0.58	Transition in slush surface near the old runway
GLV_22	Inundated area	Lowest	4.66 ±0.60	Location of overflow forming a pool across the road
GLV_30	Inundation limit	Lowest	4.80 ±0.58	limit of floodwater on road in front of school, as determined by an *in situ* consensus of residents
GLV_10	Inundation limit	High	4.83 ±0.58	Slush line between the washeteria and the power plant
GLV_31	Inundation limit	Lowest	4.99 ±0.58	limit of floodwater on road in front of school, as determined by an *in situ* consensus of residents
GLV_29	Inundated area	Lowest	5.30 ±0.58	Slush-covered area on road by church (modified)
GLV_06	Overtopped area	High	5.29 ±0.60	Crest elevation of ice ridge overtopped by waves (frozen puddle behind) at south tip of community
GLV_32	Peak flood level	High	5.59 ±0.59	Water level as observed in a truncated snowdrift on the cliffs on the north side of community

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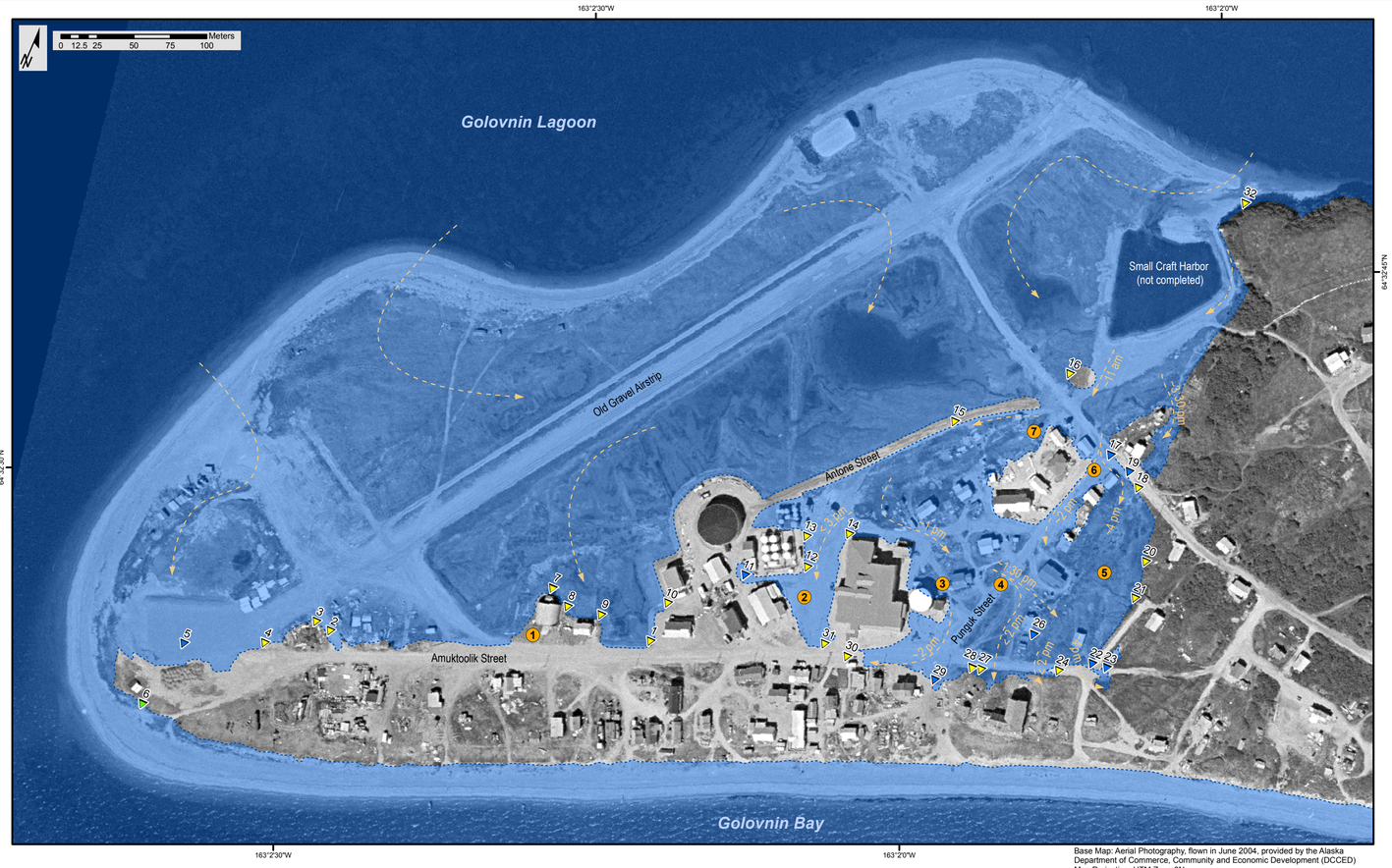


Base Map: Aerial Photography, flown in June 2004, provided by the Alaska Department of Commerce, Community and Economic Development (DCCED)
Map Projection: UTM Zone 3N
Horizontal Datum: NAD 83

Back side of Alaska State Senator Donnie Olson's hangar, looking northwest
~ 2 pm 11/9/11
Photo by John Peterson

Between the school entrance and the tank farm, looking north
~ 4 pm 11/9/11
Photo by Clara Nayokpuk

Blue house near the school, looking southwest
3:30 pm 11/9/11
Photo by John Peterson

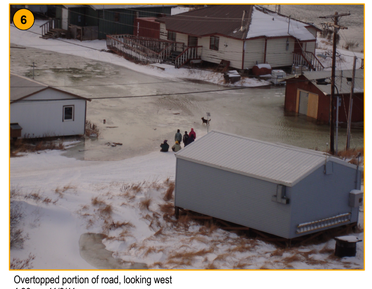
Spilling overflow at road, looking northwest
2:30 pm 11/9/11
Photo by John Peterson

Map Symbols

- Flood Extent
- Flow Direction and approximate time (11/9/2011)
- Photo Locations (1)
- Measured Observations (point location is at base of triangle)
  - 21 Inundated Area
  - 21 Indundation Limit
  - 21 Overtopped Area

Note: Golovnin Bay or Golovnin Lagoon are alternatively Golvin Bay or Golvin Lagoon. The original Russian spelling (Golovnin) is used on most published maps and charts.

Flooded communication towers, looking west
4:30 pm 11/9/11
Photo by Rachel Olson



Overtopped portion of road, looking west
4:30 pm 11/9/11
Photo by Rachel Olson

Low area looking south towards Dexter Roadhouse
4:30 pm 11/9/11
Photo by Rachel Olson

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