

NWS Alaska Region Coastal Water Level Needs

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Impacts of Changing Conditions in Alaska

S/V Altan Girl - July 2014



May 30, 2011 - Sea Ice
Kotzebue, AK structure damage



Kotlik - November 2013 Fall Storm



November 2013 protection in Golovin built days
before storm impacts



Shishmaref, AK Coastal Erosion



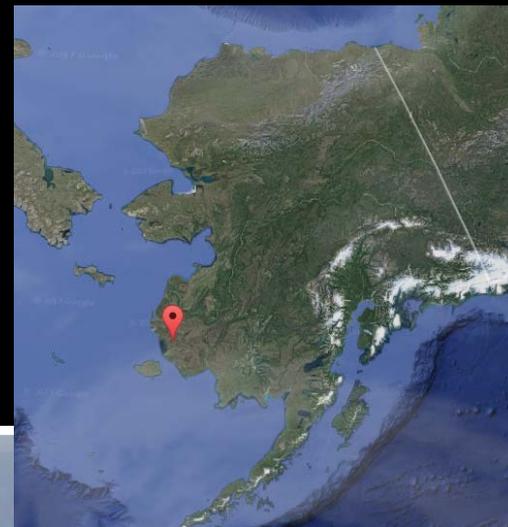


Impacts of Coastal Storms on Alaska

Newtok, AK Coastal Erosion



Before



After





NWS Evolve



- **Simpson (1993) – An accurate forecast has little or no intrinsic value if that information does not influence the customer’s risk management/decision making process**
- **Provide Impact-based Decision Support Services (IDSS)**
- **In Alaska - It’s about building community resiliency in the face of increasing vulnerability to extreme weather: Be *“Ready, Responsive, Resilient”***



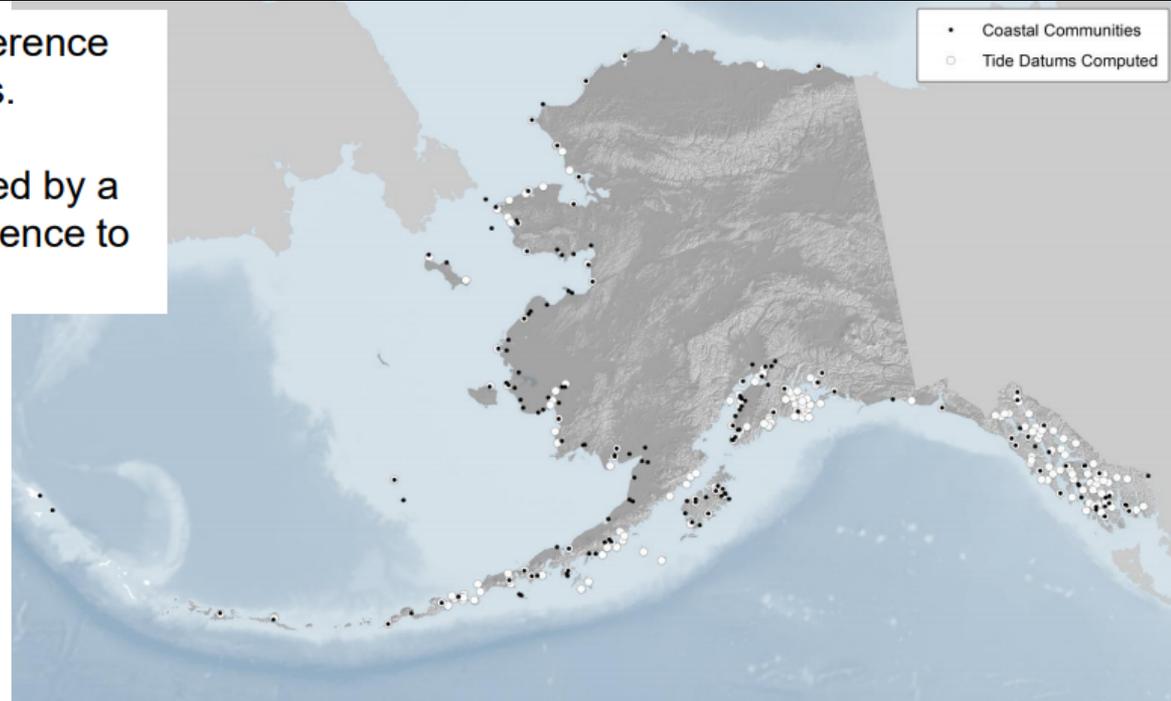
NWS Alaska Region needs Tidal Datum

Datum – A base elevation used as a reference from which to measure heights or depths.

Tidal Datum – Standard elevation defined by a certain phase of the tide, used as a reference to measure local water levels.

Tidal datums are calculated from local water level data. They are used in flood prediction to model the result of storm water levels. When linked to land-based datums, they provide a necessary conversion for storm forecasting and floodplain mapping.

Water level data nor tidal datums have been collected or linked to land-based datums for most communities in western Alaska.



Communities without tidal datums shown in black, locations with established tidal datums shown in white.

Credit: Jaci Overbeck



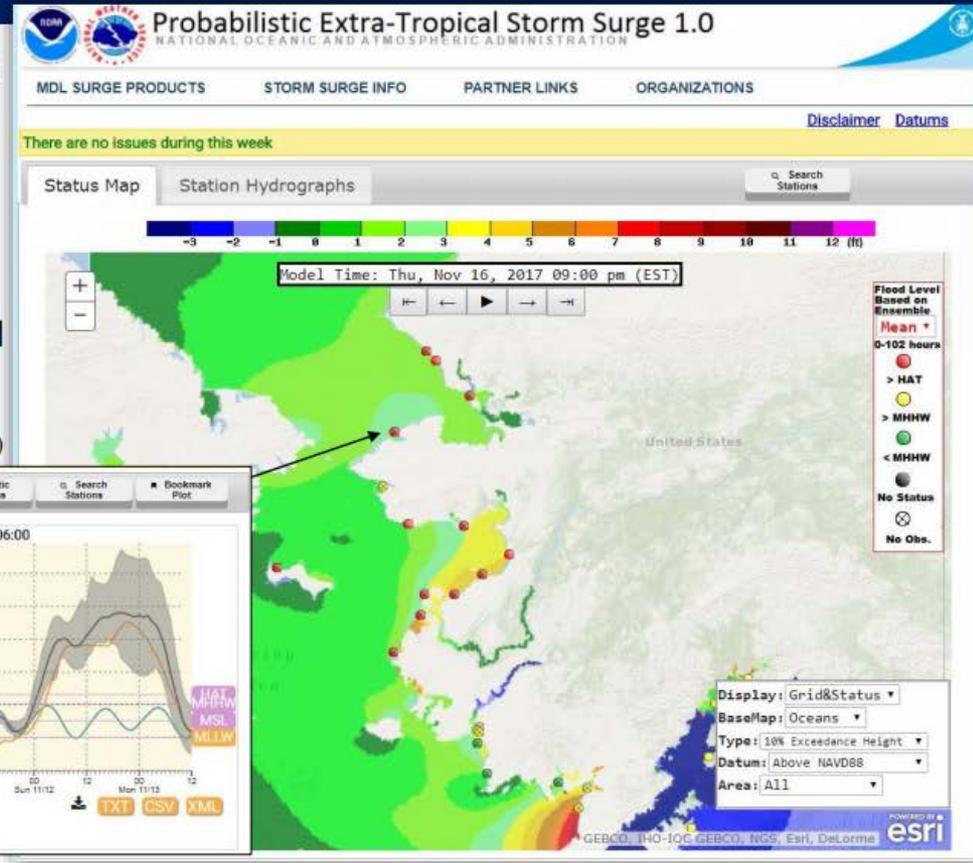
Tidal Datum used in NWS Storm Surge Modelling

Operational water level models compute components of the **Marine Total Water Level (MTWL)**.

NOAA's National Centers for Environmental Prediction (NOAA-NCEP) models the tide and storm surge components of MTWL, however, the locations of stations do not cover all Alaska communities. The model predictions are also not validated for most stations.

<http://slosh.nws.noaa.gov/etss/station/pets1.0esri/> (NOAA, 2017e)

Wave-induced water levels are not included in the NOAA-NCEP model, nor any other models run for Alaska.



Credit: Jaci Overbeck



NWS issues coastal flooding products



Coastal Flooding Expected Tonight through Monday

Chukchi Sea Coast and Kotzebue Sound

Coastal Flood Warnings remain in effect for the Chukchi Sea coastline and Kotzebue Sound until 9 AM Monday.

Beach erosion and minor coastal flooding is expected. Ice may be lifted and pushed onshore in areas not protected by sea wall in Kotzebue Sound and likely cause significant property damage and beach erosion.

Highest sea levels expected late tonight through Sunday night.

South winds will turn west tonight and generally range from 30 to 40 mph with gusts up to 50 mph.



Chukchi Sea Coastline

Surge: 4 to 5 ft.

Winds: S 40 mph will turn W 40 mph tonight and continue through Sunday night.

Impacts: Water may push up to runway and near the tank farm at Kivalina.

Kotzebue Sound

Surge: 5 to 7 ft.

Winds: S 35 mph will turn W 35 mph tonight and continue through Sunday night.

Impacts:

- Road to airport and sewage lagoon at Deering may flood.
- Minor flooding in low area east of Kotzebue near dog yards and along the lagoon on south and east of city.

Northern Seward Peninsula

Surge: 3 to 5 ft.

Winds: S 40 mph will turn W 40 mph tonight and continue through Sunday night.

Impacts: Water may push up to runway at Shishmaref.



weather.gov/Fairbanks



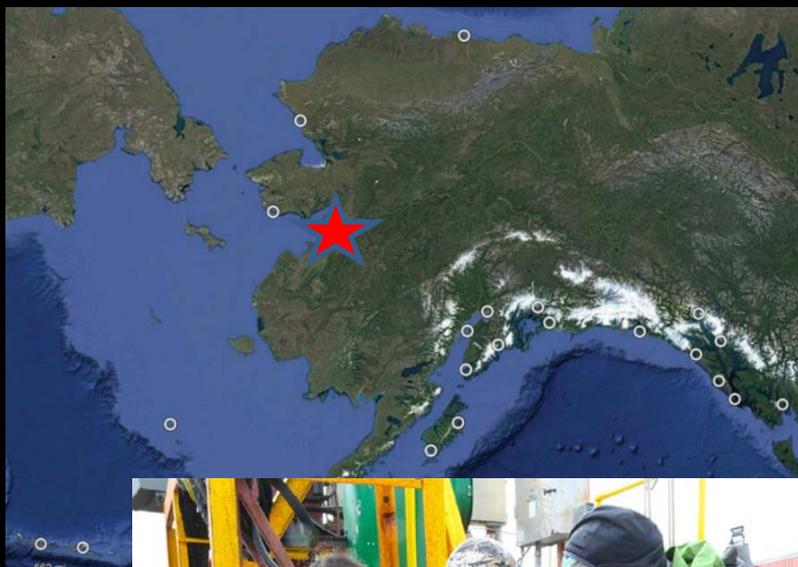
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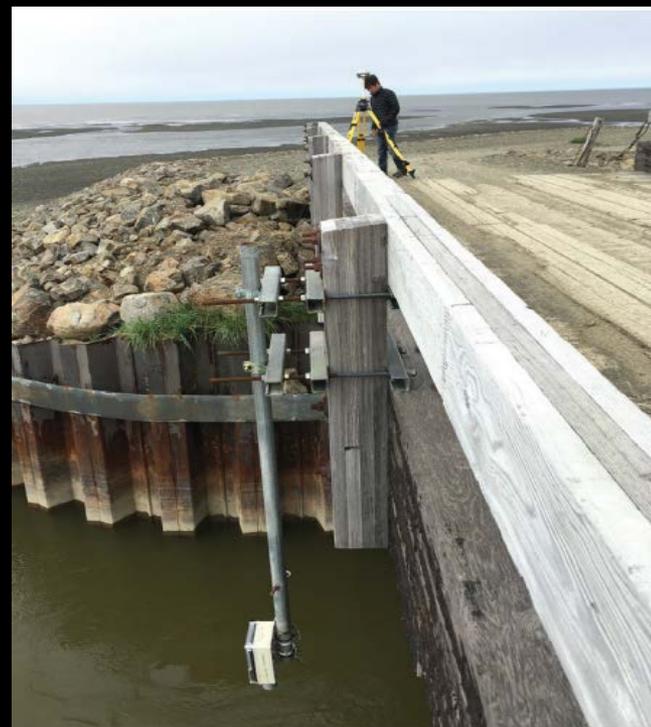
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Expanding Observations in Alaska



Ed Plumb showing the NWLON gage to children in Unalakleet



iGage re-installation at Tununak by NWS forecaster Jason Ahsenmacher



NWS Alaska Region Priorities



Community Name	WFO Ranking to Request Grumbine Model Run for "Artificial Tides" (High/Med/Low Priority)	[Jaci Overbeck] Existing NOAA benchmark station to provide tidal predictions?	Wish List for future mapping work by Jaci O (Yes/No)	Latitude	longitude
Saint George	Low	No	Yes	56.60207747	-169.547187
Saint Paul	Low	No	Yes	57.12114113	-170.2781607
Ekuk	Medium	No	No	58.80320615	-158.542688
Clark's Point	No need - existing NOAA benchmark	Yes	Yes	58.84339559	-158.5529587
Platinum	No need - existing NOAA benchmark	Yes	Yes	59.01225047	-161.818539
Dillingham	No need - existing NOAA benchmark	Yes	Yes	59.03895796	-158.4595845
Togiak	Medium	No	Yes	59.06115178	-160.3785549
Twin Hills	Low	No	No	59.07839593	-160.2771132
Goodnews Bay	High	No	Yes	59.11781064	-161.5907307
Quinhagak	No need - existing NOAA benchmark	Yes	Yes	59.74809981	-161.918029
Kwigillingok	Medium	No	Yes	59.86366705	-163.1364356
Kipnuk	Medium	No	Yes	59.93809852	-164.0436698
Kongiganak	Medium	No	Yes	59.96396431	-162.8796275
Chefornak	Low	No	No	60.15994915	-164.2731167
Eek	Medium	No	Yes	60.21810971	-162.026691
Tuntutuliak	No need - existing NOAA benchmark	Yes	Yes	60.33889578	-162.671713
Mekoryuk	No need - existing NOAA benchmark	Yes	No	60.38722956	-166.1872132
Nightmute	Low	No	No	60.47864624	-164.7261822
Umkumiute	Low	No	No	60.49753197	-165.2011449
Toksook Bay	No need - existing NOAA benchmark	Yes	Yes	60.52948361	-165.1047143
Tununak	Medium	No	Yes	60.58474852	-165.2580323
Napakiak	No need - existing NOAA benchmark	Yes	No	60.69589987	-161.9541985
Napaskiak	Low	No	No	60.70728493	-161.768284
Newtok	High	No	Yes	60.94195947	-164.6317212
Chevak	Low	No	No	61.52696214	-165.5886463
Hooper Bay	No need - existing NOAA benchmark	Yes		61.53028037	-166.098894



NWS Alaska Region Priorities



Paimiut		No		61.696263	-165.832761
Scammon Bay	Medium	No	YES	61.84196787	-165.5840256
Sheldon Point	Medium	No	YES	62.53280801	-164.8434766
Alakanuk	High	No	YES	62.68808525	-164.6176611
Emmonak	High	No	YES	62.77698489	-164.5253832
Hamilton	low	No	No	62.89531288	-163.8966088
Choolunawick	Low	No	No	62.94337396	-164.1806701
Bill Moores	low	No	No	62.94893434	-163.7812533
Kotlik	High	No	YES	63.03338145	-163.5556681
Saint Michael	Medium	No	YES	63.47728632	-162.0415229
Stebbins	High	No	YES	63.52147065	-162.2904239
Savoonga	No need - existing NOAA benchmark	Yes	YES	63.68953723	-170.4834165
Gambell	High	No	YES	63.77876656	-171.7439004
Unalakleet	No need - existing NOAA benchmark	Yes	YES	63.87233239	-160.7904392
Shaktoolik	No need - existing NOAA benchmark	Yes	YES	64.34925044	-161.1858369
Nome	No need - existing NOAA benchmark	Yes	YES	64.50033123	-165.4089609
Golovin	High	No	NO -done	64.54254285	-163.0316358
Solomon	Medium	No	YES	64.56004343	-164.4416925
Elim	High	No	YES	64.61678057	-162.2630667
White Mountain	Low	No	No	64.68060521	-163.4081122
Koyuk	High	No	YES	64.93120302	-161.1594495
King Island	Low	No	No	64.96856731	-168.0676361
Teller	No need - existing NOAA benchmark	Yes	No	65.26284248	-166.363394
Brevig Mission	Medium	No	YES	65.33394789	-166.4918227
Wales	No need - existing NOAA benchmark	Yes	YES	65.60834802	-168.0901831
Diomede	Medium	No	YES	65.76397027	-168.9139215
Deering	FIX NAME: No need - existing NOAA benchmark	Yes	YES	66.07481787	-162.7198781
Shishmaref	No need - existing NOAA benchmark	Yes	YES	66.25593002	-166.0746804
Kotzebue	No need - existing NOAA benchmark	Yes	YES	66.89764964	-162.5993588
Kivalina	No need - existing NOAA benchmark	Yes	YES	67.72623817	-164.5362376
Point Hope	No need - existing NOAA benchmark	Yes	YES	68.34699122	-166.8109888
Cape Lisburne	Medium	No	NO	68.86710269	-166.1956987