Report of Investigation 2019-6A

REGIONAL TSUNAMI HAZARD ASSESSMENT FOR SELECTED COMMUNITIES ON KODIAK ISLAND, ALASKA

ADDENDUM A: REGIONAL TSUNAMI HAZARD ASSESSMENT FOR PASAGSHAK, ALASKA

E.N. Suleimani, J.B. Salisbury, and D.J. Nicolsky

Published by
STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
2022

STATE OF ALASKA
Mike Dunleavy, Governor

DEPARTMENT OF NATURAL RESOURCES
Corri A. Feige, Commissioner

DIVISION OF GEOLOGICAL & GEOPHYSICAL SURVEYS
David LePain, State Geologist and Director

Publications produced by the Division of Geological & Geophysical Surveys (DGGS) are available for free download from the DGGS website (dggs.alaska.gov). Publications on hard-copy or digital media can be examined or purchased in the Fairbanks office:

Alaska Division of Geological & Geophysical Surveys
3354 College Rd., Fairbanks, Alaska 99709-3707
Phone: (907) 451-5010 Fax (907) 451-5050
dggspubs@alaska.gov | dggs.alaska.gov

DGGS publications are also available at:
Alaska State Library,
Historical Collections & Talking Book Center
395 Whittier Street
Juneau, Alaska 99811

Alaska Resource Library and Information Services (ARLIS)
3150 C Street, Suite 100
Anchorage, Alaska 99503

Suggested citation:
Suleimani, E.N., Salisbury, J.B., and Nicolsky, D.J., 2022, Addendum A: Regional tsunami hazard assessment for Pasagshak, Alaska, *in* Suleimani, E.N., Salisbury, J.B., Nicolsky, D.J., and Koehler, R.D., Regional tsunami hazard assessment for selected communities on Kodiak Island, Alaska: Alaska Division of Geological & Geophysical Surveys Report of Investigation 2019-6A, 4 p., 2 sheets.
https://doi.org/10.14509/30763

ADDENDUM A: REGIONAL TSUNAMI HAZARD ASSESSMENT FOR PASAGSHAK, ALASKA

E.N. Suleimani[1], J.B. Salisbury[2] , and D.J. Nicolsky[1]

Pasagshak is a small community on Kodiak Island, about 70 km (44 mi) south of Kodiak (fig. A1). The highest resolution grid that covers this community is the level 3 grid with the grid size of about 45x82 m (fig. A1). The spatial resolution of this grid satisfies the National Oceanic and Atmospheric Administration's minimum recommended requirements for estimation of the tsunami hazard zone (National Tsunami Hazard Mapping Program, 2010).

We estimate the extent of the tsunami hazard zone in Pasagshak by running all nine tsunami scenarios described in the main report (Suleimani and others, 2019). Each model run was performed for 12 hours of tsunami propagation to account for all waves in the wave train, including any secondary (reflected) waves. Figure A2 shows maximum composite tsunami height near the community as calculated from all earthquake scenarios using the level 3 grid. The absolute maximum value of the tsunami height, multiplied by a safety factor of 1.3, results in a maximum assumed runup height of 39 m (128 ft) for the community of Pasagshak. We illustrate the maximum assumed tsunami runup on land by drawing an elevation contour on the 5-m (16-ft) resolution community topographic map (Intermap Technologies, 2019) that corresponds to the maximum modeled wave height offshore. The 39 m (128 ft) elevation at the community was verified using an RTK GPS drone survey in April of 2021 to reduce uncertainties in the topographic map that covers Pasagshak. Map sheets A1 and A2 show this contour, which approximates the boundary of the tsunami hazard zone and should be used by emergency planners and public officials as a guideline in tsunami mitigation activities.

Figure A3 shows the time series of the modeled water level at a near-shore location in the community indicated by a white triangle in figure A2. Zero time corresponds to the time when the earthquake occurs, and the vertical scale corresponds to the seal level "recorded" by an observer standing at the shoreline right before the earthquake. Time series plots show that the first wave arrives in Pasagshak about 30 minutes after the earthquake and also demonstrate that significant waves will last for at least 12 hours.

REFERENCES

Intermap Technologies Inc., 2019, AK Kodiak St Lawrence IFSAR-2019 D19, USGS 15' Tiles, Cell 349, Quality Report, elevation.alaska.gov, last accessed September, 2021.

National Tsunami Hazard Mapping Program, 2010, Guidelines and best practices for tsunami inundation modeling for evacuation planning: National Oceanic and Atmospheric Administration (NOAA), NTHMP Mapping & Modeling Subcommittee.

Suleimani, E.N., Salisbury, J.B., Nicolsky, D.J., and Koehler, R.D., 2019, Regional tsunami hazard assessment for selected communities on Kodiak Island, Alaska: Alaska Division of Geological & Geophysical Surveys Report of Investigation 2019-6, 31 p., 7 sheets. doi.org/10.14509/30195

[1]Alaska Earthquake Center, Geophysical Institute, University of Alaska, P.O. Box 757320, Fairbanks, Alaska 99775-7320; ensuleimani@alaska.edu

[2]Alaska Division of Geological & Geophysical Surveys, 3354 College Rd., Fairbanks, Alaska 99709-3707.

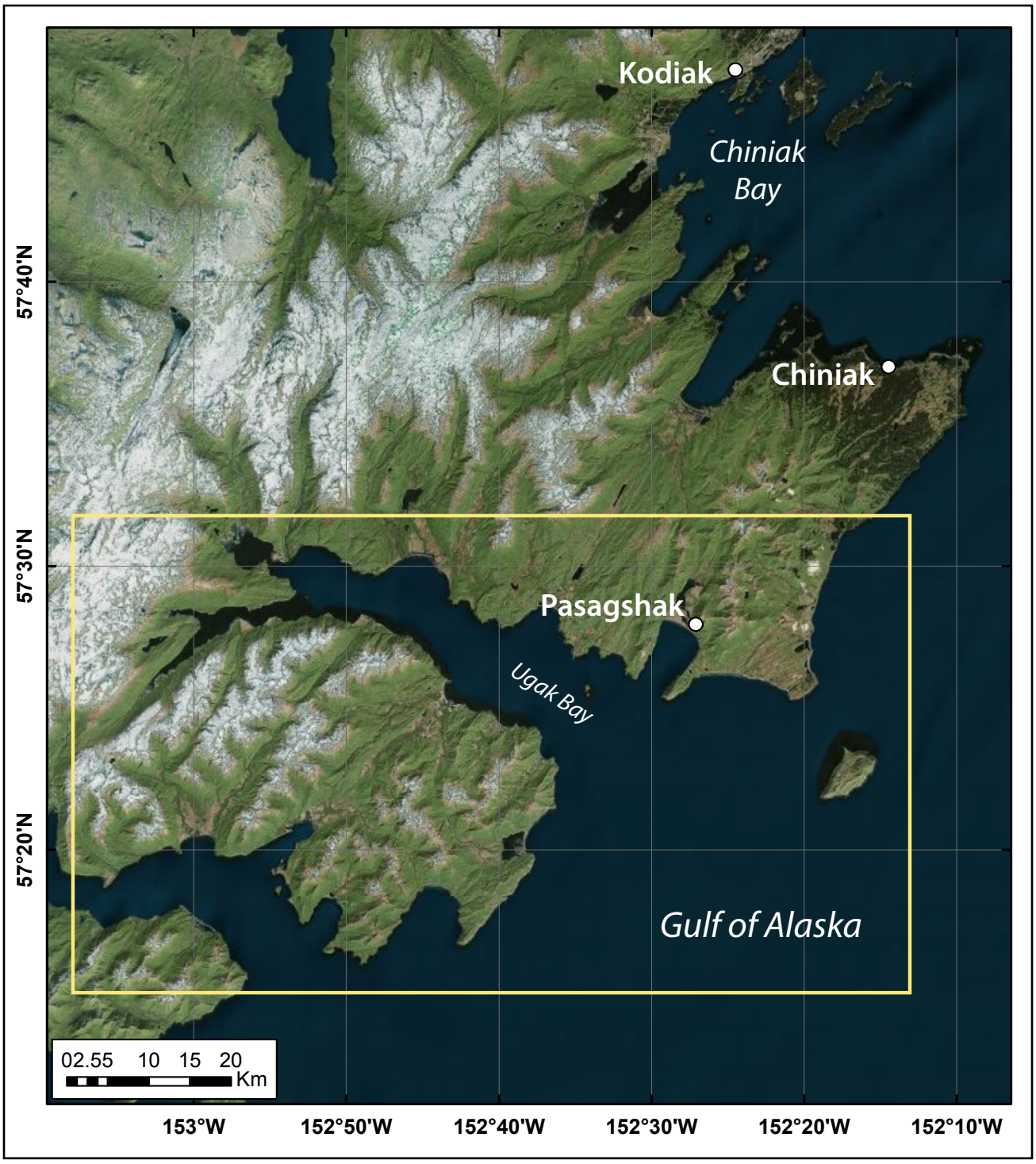

Figure A1. Map of southeastern shore of Kodiak Island and communities of Kodiak, Chiniak, and Pasagshak. Level 3 grid is outlined by a yellow rectangle.

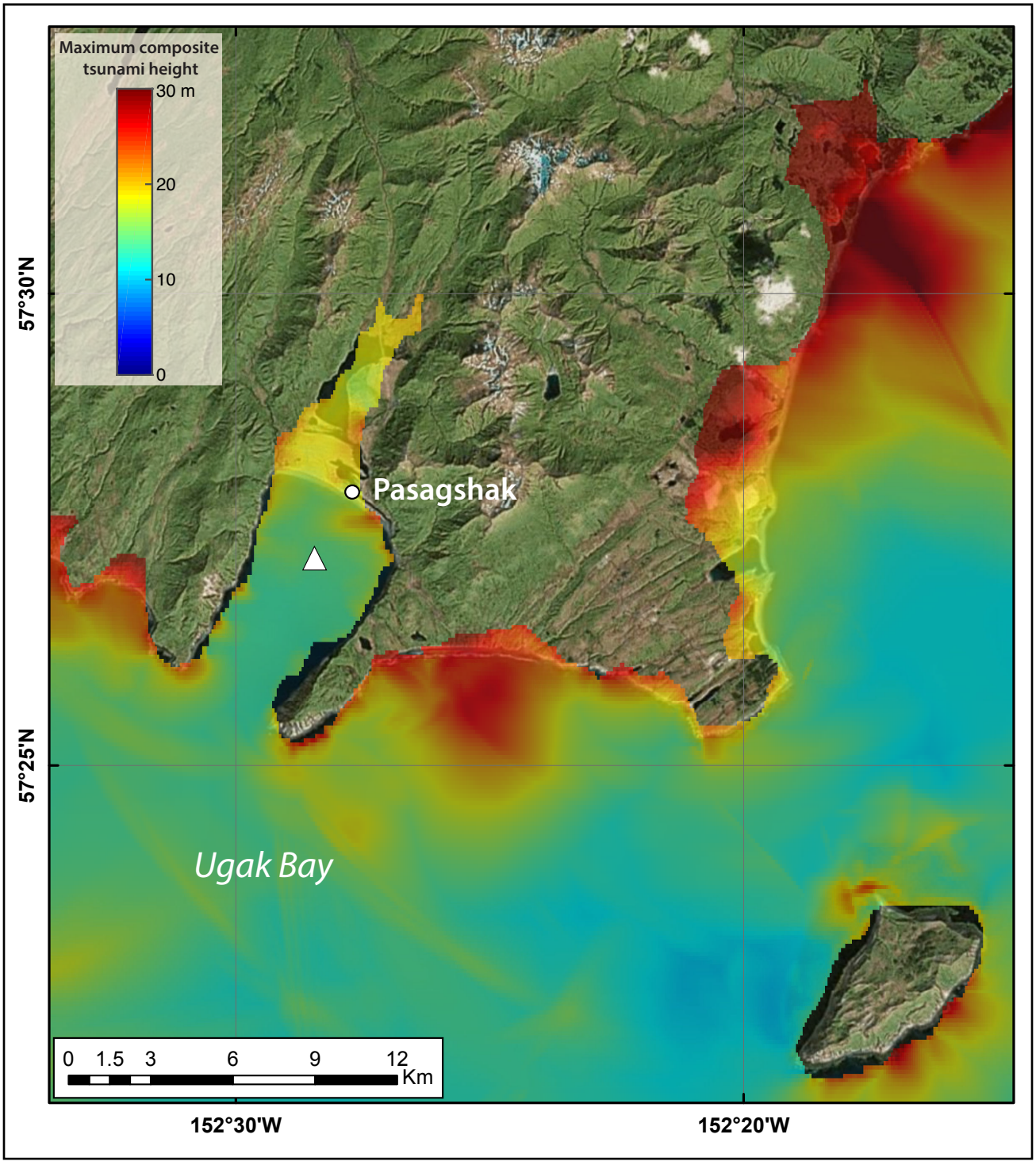

Figure A2. Maximum composite tsunami height around Pasagshak. The white triangle indicates the location of the time series point.

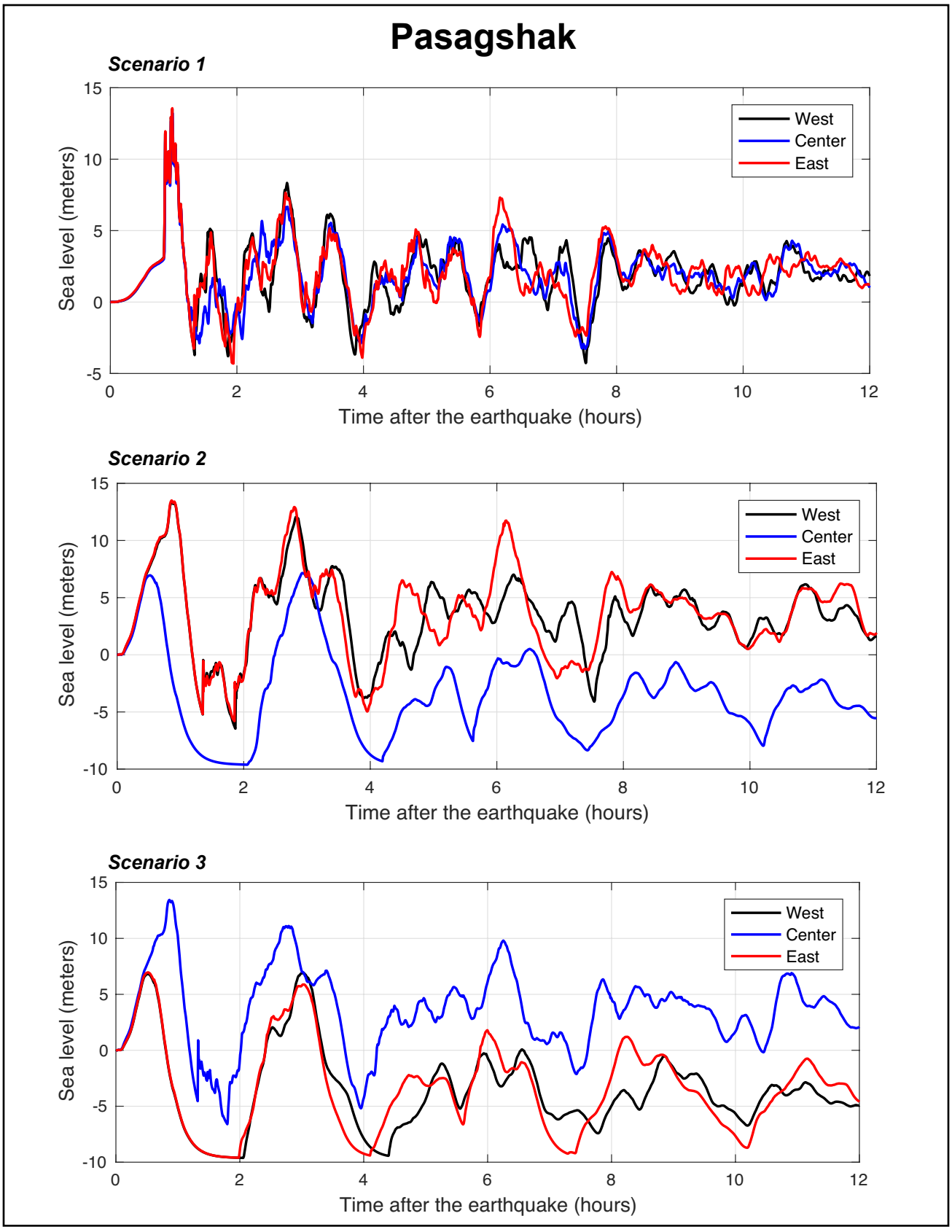

Figure A3. Time series of water level for all scenarios at Pasagshak, calculated at the location shown as a white triangle in figure A2.