

# **Supplement to: The Laurentide Ice Sheet in southern New England and New York during and at the end of the Last Glacial Maximum - A cosmogenic-nuclide chronology**

Allie Balter-Kennedy<sup>1,2</sup>, Joerg M. Schaefer<sup>1,2</sup>, Greg Balco<sup>3</sup>, Meredith A. Kelly<sup>4</sup>, Michael R. Kaplan<sup>1</sup>, Roseanne Schwartz<sup>1</sup>, Bryan Oakley<sup>5</sup>, Nicolás E. Young<sup>1</sup>, Jean Hanley<sup>1</sup>, Arianna M. Varuolo-Clarke<sup>1,2</sup>

<sup>1</sup>Lamont–Doherty Earth Observatory, Columbia University, Palisades, NY 10964, USA

<sup>2</sup>Department of Earth and Environmental Sciences, Columbia University, New York, NY 10027, USA

<sup>3</sup>Berkeley Geochronology Center, Berkeley, CA 94709 USA.

<sup>4</sup>Department of Earth Sciences, Dartmouth College, Hanover, NH 03755, USA

<sup>5</sup>Environmental Earth Science Department, Eastern Connecticut State University, Willimantic, CT, 06226, USA

*Correspondence to:* Allie Balter-Kennedy (abalter@ldeo.columbia.edu)

## **Contents of this file**

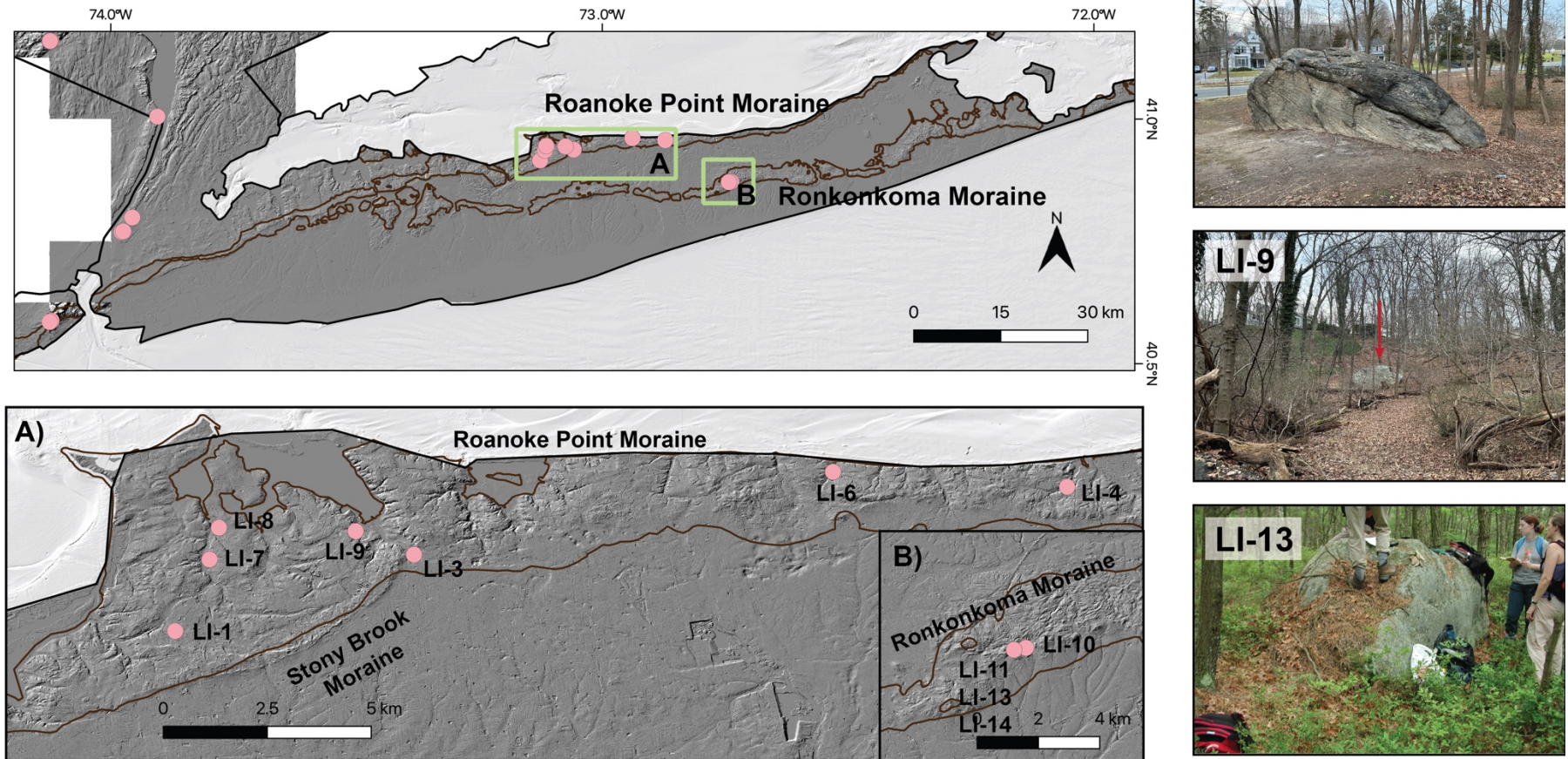
-Figures S1–S3

## **Supplemental material uploaded as separate files**

-Tables S1-S3

-Additional sample photos for the new sample locations associated with this publication can be found on ICE-D:Laurentide (<https://version2.ice-d.org/laurentide/publication/1187/>)

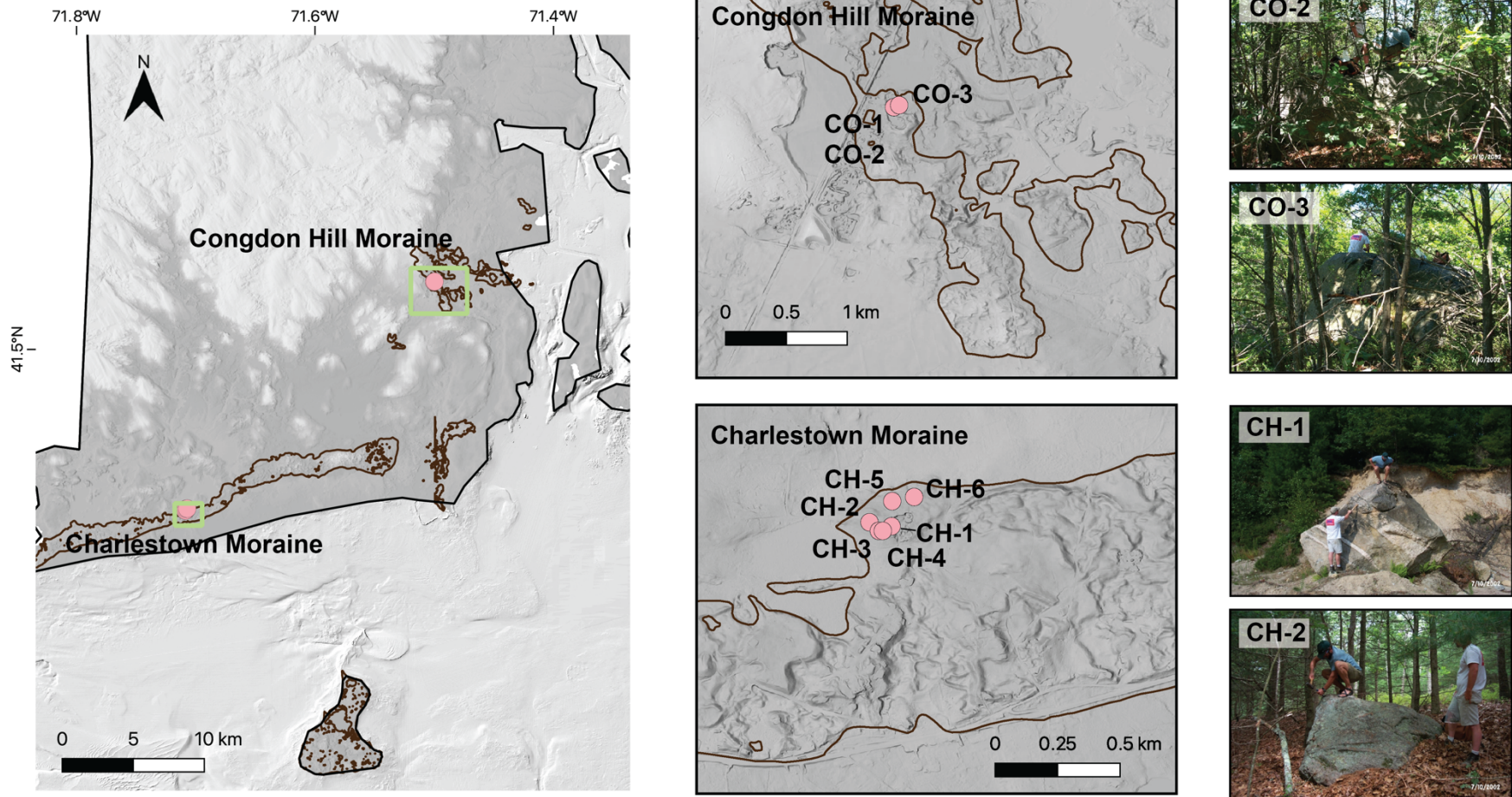
## Long Island Sample Locations



**Figure S1** - High resolution hillshade of Long Island and representative sample photos from the Roanoke Point and Ronkonkoma moraines. Topography is the New York State 2 m Hillshade from the New York State GIS Program Office (2023). Bathymetry from NOAA Office of Coast Survey BlueTopo product is shown in light grey. Brown moraine outlines are from the surficial geologic map of New York (Cadwell et al., 1989). Photos show representative samples from the Roanoke Point moraine (LI-8, stable position on topographic high; LI-9, boulder located in topographic low, age considered a young outlier) and the Ronkonkoma moraine (LI-13). As described in the text, all samples on the Roanoke point moraine, except LI-1 and LI-8, are in topographic lows, and we therefore hypothesize that they have experienced some degree of postdepositional disturbance, resulting in an average exposure age that is younger than the true moraine deposition age.



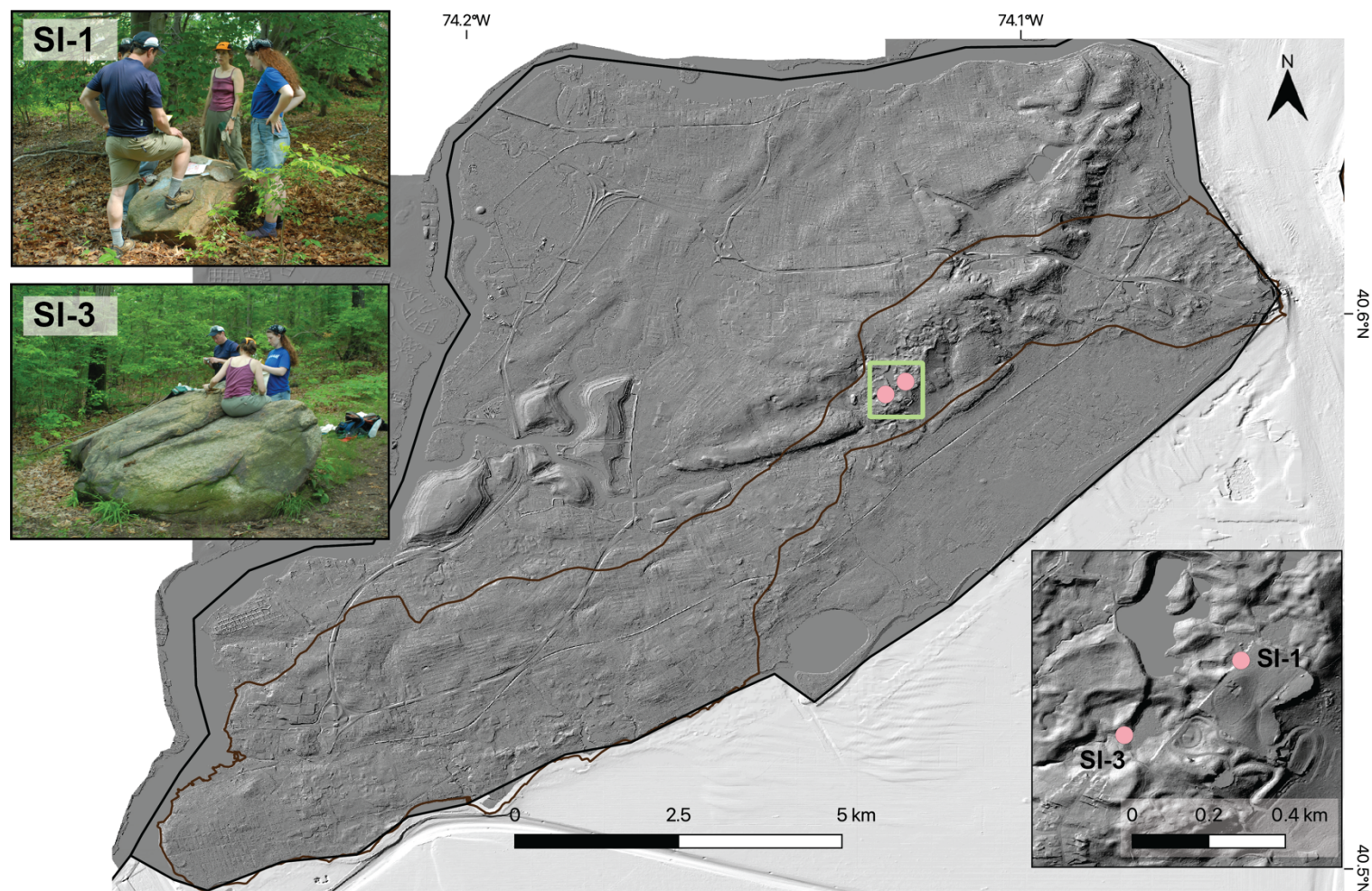
## Rhode Island Sample Locations



**Figure S2** - Shaded relief map of Rhode Island and representative sample photos from the Charlestown and Congdon Hill moraines. Topography is the Rhode Island Lidar Shaded Relief from Rhode Island Geographic Information System (2022). Bathymetry from NOAA Office of Coast Survey BlueTopo product is shown in light grey. Brown moraine outlines are from the surficial geologic map of Rhode Island (Boothroyd et al., 2003). Photos show representative samples from the Congdon Hill moraine (CO-1, CO-3) and the Charlestown moraine (CH-1, located in gravel pit, age is the one young outlier on this moraine; CH-2).



## Staten Island Sample Locations



**Figure S3** - Shaded relief map of Staten Island and sample photos from the Harbor Hill moraine on Staten Island. Topography is the New York State 2 m Hillshade from the New York State GIS Program Office (2023). Bathymetry from NOAA Office of Coast Survey BlueTopo product is shown in light grey. Brown moraine outlines are from the surficial geologic map of New York (Cadwell et al., 1989). Photos show the two samples from the Harbor Hill moraine on Staten Island. SI-1 ( $41.6 \pm 2.4$  ka), is at topographic high, but is considered to have nuclide inheritance, while SI-3 ( $18.9 \pm 2.1$  ka) is located in a drainage and is likely affected by postdepositional disturbance.



## References

- Boothroyd, J. C., McCandless, S. J., and Dowling, M. J.: Quaternary Geologic Map of Rhode Island: Rhode Island Geological Survey STATEMAP Program, scale scale: 1:100,000.  
[http://geothermal.isgs.illinois.edu/aasggeothermal/rigs/map/RI\\_Quaternary\\_Geology\\_100K.zip](http://geothermal.isgs.illinois.edu/aasggeothermal/rigs/map/RI_Quaternary_Geology_100K.zip), 2003.
- Cadwell, D.H.: Surficial Geologic Map of New York: Lower Hudson Sheet. New York State Museum Map and Chart Series. The University of the State of New York, Albany, NY, 1989.
- New York State GIS Program Office: New York State 2 Meter DEM,  
[https://elevation.its.ny.gov/arcgis/rest/services/NYS\\_Statewide\\_Hillshade/MapServer](https://elevation.its.ny.gov/arcgis/rest/services/NYS_Statewide_Hillshade/MapServer), last access: 9 July 2024, 2023.
- Rhode Island Geographic Information System: Rhode Island Lidar Shaded Relief,  
[https://maps.edc.uri.edu/rigis/rest/services/TOPO/RI\\_202203\\_Lidar\\_Shaded\\_Relief/ImageServer](https://maps.edc.uri.edu/rigis/rest/services/TOPO/RI_202203_Lidar_Shaded_Relief/ImageServer)  
last access: 9 July 2024, 2022.