

# MapTEACH: PLACE-BASED GEOSPATIAL LEARNING AND APPLICATIONS IN ALASKA

*Second Edition*

Teacher and Student Guide  
Grades 6-12

De Anne Stevens	Alaska Division of Geological & Geophysical Surveys
Sidney Stephens	Geography Department, University of Alaska Fairbanks
Patty Burns	Alaska Division of Mining Land and Water
Peter Webley	Geophysical Institute, University of Alaska Fairbanks
Patricia Heiser	Geography Department, University of Alaska Fairbanks
Zachary Meyers	University of Alaska Fairbanks
Sam Batzli	University of Wisconsin Madison
Timothy Olsen	University of Wisconsin Madison

**2012**

With assistance from:

Susan Paskvan and Gina Hrinko – Yukon-Koyukuk School District  
Angela Larson – project evaluator  
Nicole Dufour – GIS technician

In collaboration with:

Alaska Division of Geological & Geophysical Surveys, Alaska Division of Mining, Land, and Water,  
Alaska Geographic Alliance, Alaska Rural Systemic Initiative, Calista Corporation, Tanana Chiefs  
Conference, Yukon-Koyukuk School District

Funding by:

The U.S. Department of Education, Alaska Native Education Program  
(Award Number S356A090040)

Previous Funding by:  
The National Science Foundation ITEST Program  
(Grant Numbers ESI-0322980, ESI-0322958 and ESI-0323191)  
and

The UA Geography Program and the GeoData Center, University of Alaska Fairbanks

***MapTEACH thanks the following teachers for their participation, review, and feedback:***

Heidi Wright, Gladys Dart School, Manley  
Nicholas Graves, Allakaket School, Allakaket  
Dianne Shirrel, Johnny Oldman School, Hughes  
Lisa Kleyneneberg, Andrew K. Demoski School, Nulato  
Monica Garza, Minto School, Minto  
Geoff Johnson, Raven Correspondence School, Palmer  
Sam Chamberlain, Arctic Village School, Arctic Village  
Michelle Amundson, Hoonah Elementary School, Hoonah  
Robert Erbeiding, Charles Leask Middle School, Metlakatla  
Angela Hayden, Jack Egnaty Sr. School, Sleetmute  
Chuck Hugny, Nenana High School & Living Center, Nenana  
Denis Gardella, Top of the Kuskoswim School, Nicholai  
Frida Shroyer, Hutchison High School, Fairbanks  
Gladys Abraham, Hooper Bay School, Hooper Bay  
Katie Kennedy, University of Alaska Fairbanks  
Olga Skinner, Effie Kokrine Charter School, Fairbanks

Sam Barney, Jimmy Huntington School, Huslia  
Lisa Wicke, Allakaket School, Allakaket  
Dawn Pomrening, Johnny Oldman School, Hughes  
Judy Madros, Andrew K. Demoski School, Nulato  
Pete Moyryla, Merrelaine A. Kanagas School, Ruby  
Doug Dysart, Jimmy Huntington School, Huslia  
Ben McLuckie, Hoonah High School, Hoonah  
Jason Pipkin, Metlakatla High School, Metlakatla  
Beth Sandefur, Metlakatla High School, Metlakatla  
Bonnie Hauschka, Cantwell School, Cantwell  
Debbie Chalmers, Mendenhall River School, Juneau  
Diane "Molly" Hale, Hooper Bay School, Hooper Bay  
Geoff Buerger, Anderson School, Anderson  
John Carlson, Watershed School, Fairbanks  
Michael Warren, Central Middle School, Anchorage  
Sheryl Meierotto, Effie Kokrine Charter School, Fairbanks

***MapTEACH also thanks the following for their involvement, cooperation, and help:***

**Individuals**

Sarah Silas	Berkman Silas	Virginia Woods	Lige Charlie	Sam Demientieff
Frank Gurtler	Byron Charlie	Jack Wright	Mamie Maloney	Jason Mayrand
Espen Jervsjø	Gary Holton	Pam Redington	Ken Charlie	Neal Charlie
Albert Kowchee	Geraldine Charlie	Margaret Saunders	Ruth Emmons	Moses Paul
Emma Walton	Kim Streeter	Bil Aldrich	Elsie Titus	Jacob Ahwinona
Jackie Fenno	Andy Angaiak	Ray Barnhardt	Wes Alexander	Lincoln Trigg
Neal Brown	Shirley Holloway	Martin Jeffries	Robert Charlie	Tom Heinrichs
June McAtee	Elena Sparrow	Josephine Riley	John Wehde	Matt Gilbert
Barb Pungowiyi	Gilbert Ketzler	Mark Ebels	Vernel Titus	Irene Anderson
Bergman Silas	Howard Luke	Mary Alexander	Phoebe Omilak	Eleanor Laughlin
Carl Aschenfelder	Hugo Lindfors	Matt Ganley	Jeff Selvey	

**Organizations**

Alaska Native Knowledge Network	Alaska Department of Education	Alaska Humanities Forum
Barnette Magnet School	Sitnasuak Native Corporation	Annette Island School District
Cultural Heritage Education Center	Bering Strait Native Association	Bering Strait School District
Hoonah City Schools	Effie Kokrine Charter School	Eskimo Heritage Program
Kuspuk School District	Kawerak Elders Advisory Committee	Kawerak, Inc.
Nenana Living Center	XYZ Club Senior Center	Yukon Flats School District
Nenana Tribal Council	Nenana Public Schools	Nenana Senior Center
Geo-Data Center, UAF	Nenana Wellness Coalition	Nome-Beltz High School
Northwest Alaska Career and Technical Center (NACTEC)	Northwest Arctic Borough School District	Geographic Information Network of Alaska (GINA)
	Gaalee'ya Spirit Camp	Old Minto Culture Camp

Very special thanks to all the wonderful students we have worked with in developing MapTEACH!

## TABLE OF CONTENTS

MapTEACH Curriculum Overview .....	i
------------------------------------	---

### Place Names and Landmarks (PNL)

PNL 1	Introducing the Unit and Mental Maps.....	1
PNL 2	Simon Paneak's Sketch Maps.....	5
PNL 3	Working with Local Experts – Mental Maps and Stories.....	21
PNL 4	What's in a Name? .....	27
PNL 5	Picking Coordinates from a Paper Maps.....	41
PNL 6	Field Trip Guide.....	53

### Remote Sensing/Geology (RSG)

RSG 1	Air Photo Interpretation .....	59
RSG2	Comparing Topographic Maps and Air Photos .....	67
RSG 3	Seeing in Stereo and Route Finding .....	79
RSG 4	Evaluating Erosion.....	123
RSG 5	Change Over Time .....	131

### Global Positioning System (GPS)

GIS-GPS Quick Start.....	141	
GPS 1	Introduction to GPS with Geocaching .....	145
GPS 2	Field Data Collection for GPS Data and Digital Photo Documentation .....	157
GPS 3	Using Your Own Field Trip Data.....	167
GPS 4	Hotlinking to a Field Trip Data Document .....	197
GPS 5	Using Track Log Data .....	211

### Geographic Information Systems (GIS)

GIS-GPS Quick Start.....	227	
GIS 1	Many Layers Make a Map.....	231
GIS 2	Introduction to GIS using AEJEE.....	233
GIS 3	Working with GIS Data: View, Label, Measure and Identify.....	255
GIS 4	Maps with Raster Images I: Statewide Shaded Relief .....	275
GIS 5	Maps with Raster Images II: Local Shaded Relief Base Map.....	285
GIS 6	Maps with Raster Images III: Satellite Imagery .....	299
GIS 7	Community GIS: Geologic Hazards .....	311
GIS 8	Community GIS: Natural Resources .....	325

GIS 9	Community GIS: Land Management.....	335
GIS 10	"Good Map - Bad Map".....	351
GIS 11	Community GIS: Map Layouts .....	357
GIS 12	Adding Coordinate Locations into a GIS.....	373
GIS 13	Hotlinking .....	387
GIS 14	Change Over Time: Shorefast Sea Ice.....	395

**Google Earth (GE)**

GE 1	Navigation in Google Earth: Virtual Scavenger Hunt .....	409
GE 2	Introduction to Places, Points, and Images in Google Earth .....	423
GE 2A	Adding Images, Videos, and Links to Google Earth Placemarkers Using HTML .....	437
GE 3	Placemarkers, Paths and Elevation Profiles .....	443
GE 4	Investigating Change Over Time Using Google Earth.....	457

**Technical Appendices**

TA A	Preparing Alaska Base Map Imagery for Local Mapping Projects .....	471
TA B	Downloading Aerial Photos of Your Community .....	481
TA C	Downloading Topographic Maps of Your Community.....	487
TA D	Preparing Raster Imagery in ArcGIS for AEJEE .....	499
TA E	Adapting Mac-Based GIS and GPS Lessons for PC Use.....	501

**The MapTEACH Curriculum,  
Supporting Resources,  
GIS Data and Software**

Are available for download from the MapTEACH website at:  
<http://www.mapteach.org>

Or can provided by MapTEACH on a DVD by contacting:  
De Anne Stevens - MapTEACH  
Alaska Division of Geological & Geophysical Surveys  
3354 College Road  
Fairbanks, AK 99709-3707  
Tel: 907-451-5014  
E-mail: [deanne.stevens@alaska.gov](mailto:deanne.stevens@alaska.gov)