

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

MapTEACH (Mapping Technology Experiences with Alaska’s Community Heritage) is an educational curriculum for middle and high school students designed to help them both (1) understand the physical and cultural features of their environment, and (2) use mapping technologies to enhance and portray that new understanding. As such, it emphasizes the integration of three focus areas: geoscience, local landscape knowledge, and geographic information science (GPS, GIS and remotely sensed imagery). MapTEACH gives Alaskan students the opportunity to make a connection between traditional ways of viewing the landscape, scientific ways of making observations about the landscape, and the process of using cutting-edge information technologies to gather and disseminate information about the landscape. At its core, this curriculum is place-based and interdisciplinary in nature, and seeks to connect students, teachers, community members and scientists in an exploration of the local landscape from multiple perspectives.

This second edition is the result of three additional years of work with teachers and students around the state, piloting new lessons and further refining the content of the first edition. Notable changes include the addition of the Google Earth strand, revisions to the Place Names and Landmarks and Remote Sensing and Geology sections, and updates to the GIS and GPS sections in order to keep pace with changes in computer technology. Additionally, while we have maintained a Mac focus for the GIS and GPS lessons, we have included new guidelines to adapt the lessons for use on PC platforms.

Lessons are grouped into the sections described below. Each section has a coherent set of goals and, with a few exceptions, lessons in each section are sequential so that they can be worked through in part or in whole in the order presented. In practice, however, the lessons can be used in a variety of combinations, mixing and matching lessons from several sections to achieve desired learning outcomes and to augment other classroom activities.

We expect and hope that as you become more familiar with this curriculum, you will find new ways to use and adapt these lessons and make them your own. We hope you will share these adaptations with us and also let us know what we might do next to make this curriculum more responsive to your needs.

### **Section 1: *Place Names and Landmarks***

These lessons seek to answer the question “How do you know where you are?” by grounding students in an appreciation of their own mental maps and then expanding this to include understanding and documentation of the place names and landscape knowledge of local experts. This work is based on the belief that there are many ways to “know” where you are and that each way of knowing contributes to our overall understanding of the landscape.

### **Section 2: *Remote Sensing and Geology***

These hands-on lessons introduce students to remotely sensed imagery by exploring local air photo imagery, stereo pair photographs and topographic maps, and using these maps and images to evaluate river erosion and change over time. These lessons are not only interesting and relevant in their own right, but provide a solid introduction to the imagery used in several of the GIS lessons.

### **Section 3: *Global Positioning System***

These lessons guide students through the basic uses of handheld Global Positioning System (GPS) units by finding and placing geocaches, documenting waypoints, and downloading location information into a computer in order to create a map of a place or a journey. Map-making lessons include advanced elements of GIS (Geographic Information Systems).

### **Section 4: *Geographic Information Systems***

These lessons enable students to use GIS mapping technology to enhance and portray their understanding of the world around them by: (1) exploring the fundamental concept that maps are made of layers of data and a computer allows us to stack these layers in many different ways; and (2) manipulating existing data layers and adding their own data to generate original maps of personal, cultural or scientific interest. These lessons were created using screenshots and directions for Mac computers, but the software also works on PC computers (and an appendix describing how to adapt the lessons is included in this curriculum).

### **Section 5: *Google Earth***

These lessons enable students to use basic Google Earth technology to enhance and portray their understanding of the world around them by: (1) importing waypoints and photos into placemarkers to create virtual maps; and (2) using a variety of other data layers to illustrate concepts of change over distance and time.

## **Appendices**

Several of the lessons included in the MapTEACH curriculum involve using topographic maps and air photos of local communities and making digital maps using GPS and other data collected locally by students. Since it is not feasible for MapTEACH to be able to anticipate student needs for air photos, topographic maps or satellite base map data, we have developed procedures so teachers (or advanced students) can generate their own image layers for use in these lessons. Instructions on how to adapt the Mac-based GIS and GPS lessons for PC use are also included.