

AppGeo data expert Patrick McHallam is a member of the Charles River Watershed Association and recently participated in a mapping project in his canoe. To see the results of this survey, look at the following link. **Google Earth software is required.** [Click here to install Google Earth.](#)

[Click here](#) to view Pat's project

Pat's Field Report: In April of 2006, I participated in a volunteer shoreline survey for possible non-point pollution sources for the Charles River Watershed Association (CRWA) in Massachusetts. The primary goal of the survey was to document potential non-point pollution sources, such as stormwater run-off pipes, drainage into the river from streets, construction areas, landscaped areas with potential high pesticide and fertilizer use, etc. The particular segment of the survey I was assigned to was in the Waltham area of the river, and I did it via canoe.

While performing the survey, I took along a hand-held GPS unit, allowing it to record and save our track as we paddled along. I also took a series of photographs with a digital camera. After the survey was completed, I took these two data sources – the GPS track and the set of digital photographs – and produced a Google Earth KMZ file, which allows the photos to be displayed properly geographically referenced in Google Earth, with comments. The steps needed to do this were:

- Download the stored GPS track from the handheld device to a laptop.
- Download the digital pictures from the camera to the laptop
- Run software on the laptop which compares the time-stamp on the digital photos to the GPS track timestamps to assign a latitude and longitude to each photo, writing the location information into the EXIF data associated with the digital photo.
- Generate a KMZ file of all the photos, with comments, so they can be easily viewed in their proper geographical context in Google Earth.

*Please note the potential non-point pollution sources in the pictures are indeed **potential** sources only; no actual pollution of the Charles River has been documented or confirmed in any way from any of these sources.*

