GPS Meets Orthophotography

An activity idea from a non-educator who is a Geographer and GIS Specialist:
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Grade Level(s): middle and high school students

Estimated Time: The activity could take weeks dependent upon the access to GPS units.

Purpose: To enable students to use a GPS unit, to understand how global positioning systems work, and to gain a sense of personal and social use of space.

Objectives: Upon completion of this activity, students should be able to
1. utilize a GPS unit,
2. explain how a global positioning system works,
3. upload GPS data to a computer software program,
4. discuss the resulting pattern obtained from personal and group data, and
5. identify aspects of the community on an aerial photograph.

Materials Required
- GPS unit(s)
- Software to transfer GPS data to computer
- Local orthophotography (aerial photography)

Procedures:
1. Introduce the students to the basics of a global positioning system (use the instructional guide or visit the Garmin website)
2. Introduce the students to the GPS unit. Practice using the unit outside.
3. Nightly, one student gets to take the GPS unit home. The student should take readings anywhere they go from the time they leave school until they return the next morning. Each waypoint/reading/mark should be identified by site name also (gas station, Target, Walgreens, Kroger…).
4. Then, upon returning to school the next day, the student would upload their data points.
5. Once all of the students have an opportunity to utilize the GPS unit after school, the entire set of data points should be over-layed onto the local orthophotography (aerial photograph). The pattern of where everyone travels when they are not at school should be interesting to see. (I imagine the paths from school will look like a flower when everyone is done?) Discuss similar patterns; different patterns.
6. Have the students identify objects on the aerial photograph as they are discussing the patterns. What relationships do the students see between the patterns and the objects in the aerial photograph.
7. Students write an essay about their GPS experience and their pattern interpretation and their thoughts about the use of the orthophotography.

Assessment:
1. Students will participate in the activity and will mark/read at least five sites while they have the GPS unit.
2. Students will successfully upload the data from the GPS unit to the computer software.
3. Students will contribute to the discussion.
4. Students will write a 2-page essay.

Extension:
Students could take the GPS unit home for a weekend or for an extended road trip. This data would provide an extreme pattern.