[TECH TOOLS]

Putting Biology Field Work on a Map

By Sue De Pasquale

To a casual observer on the Homewood campus this fall, the scene must have been a bit curious: five Hopkins freshmen, kneeling down beneath an oak tree, gathering and counting the acorns that had dropped. In fact, the freshman team was there on official business for their General Biology course. Their assignment: to assess the long-term impact of the cicada invasion of 2004.

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A screen shot of the main image map of the Biomes of Homewood software. Student and faculty users use this map to click an area of campus to log data. The numbers of each area correspond to the numbers assigned to the student teams (e.g., Area 55 is assigned to Team 55).

The team is one of 60 assigned to different "biomes" across the Homewood campus, from the President’s Garden to the lushly overgrown woods of Stoney Run. Throughout the fall and next spring, the student teams will gather data and observe changes in the flora and fauna of their biome—counting squirrels, recording bird calls, studying leaf structure—as part of the "Biomes of Homewood" project. Key to the project, first unveiled in 2004, is a web-based interactive map and software program developed by faculty and staff at Hopkins’ Center for Educational Resources (CER), through a grant from the Howard Hughes Medical Institute.

With the map and software, students can "zoom in" to find the boundaries of their particular biome, store and update data, and access data from past years. "Data can also be pooled from all of the biomes to conduct a survey across the campus," notes the CER’s Richard Shingles, one of the project’s creators. He adds, "We’re getting students to use all their senses. They can upload photos they take, as well as audio-files, where they’ve captured the sounds of birds and insects to help in identifying them."

The initial inspiration for the project came from Biology faculty who wanted to get freshmen out of the lecture hall and into the field. "The idea is for students to take the concepts they learn in the classroom out into the real world," explains the CER’s Michael Reese.
At the beginning of the year, freshmen are randomly assigned to one of 60 small teams, and assigned an upper-class student "mentor" who helps them identify their biome, offers feedback on assignments, and answers questions. Field assignments (four in the fall and four in the spring) are posted online, and students can store and change their data before turning assignments in online for grading.

Biology vice-chair Allen Shearn has found that the random grouping of freshmen so early during their time at Hopkins has had unforeseen benefits. "Students tend to get into tight little groups very fast. They don't necessarily integrate that much," he says. "This forces them to meet people and work with people they wouldn't ordinarily meet. That's quite valuable."

Shingles recalls one particular student team that really hit it off. "All five of them came from different countries and they all ended up becoming good friends," he says, adding, "Two of them even ended up dating."

According to Shearn, student engagement in the Biomes of Homewood project has strengthened their mastery of General Biology, allowing the bar to be raised in subsequent classes. "Our more advanced Biology courses can now be taught at a higher level," he says.

The benefits extend beyond Biology, say Shingles and Reese, who note that the interactive map used for the Biomes of Homewood has been easily adapted for use by researchers in other subject areas, including Art History and Cognitive Science.

Says Shearn, "The metaphor of the map applies to so many things. The limitations really are your own imagination. More courses should take advantage of it!"