GIS in Higher Education Summit – April 30, 2010, Pikes Peak Community College
Meeting Notes compiled by Jamie Fuller and Sophia Linn, Colorado State University

Welcome
Donna Arkowski, Department Chair-Geography and GIS, PPCC
Mary-Ann Wermers, Dean, Health, Environmental, Natural and Physical Science Division

State of affairs: GIS in Higher Ed in Colorado
Sophia Linn covered for Melinda Laituri who was unable to attend. Review of last year’s Summit at CSU; emphasize need for ‘action items’ to come from this Summit.

Status of GIS in Higher Education Website
Jamie Fuller presented the GIS in Higher Education website (http://gis-highered.colostate.edu) and encouraged all participants to review their institution’s representation on the site. At this point, all corrections/updates should be sent to Jamie via the Geospatial Centroid at CSU: gis@colostate.edu. Comments: This site should be linked from other sites including the Colorado Geographic Alliance (COGA), somewhere at the state’s higher education site (http://highered.colorado.gov/) and community college and/or workforce development sites. There was some discussion about enabling a login to this site that would allow others to make updates. This will be considered. Similarly, setting up a community blog was also discussed. Jamie will look into options for creating this.

Website action items:
• Wiki /List serve
• Log in
• Way to post jobs
• Links of org/companies

Information from the field
▪ Esther Worker and Jeremiah Lindemann, ESRI: What’s coming with ArcGIS10?

Jeremiah provided a preview on what to expect from ArcGIS 10, including: slide-out windows, layer packages/map packages, ArcGIS Online, sharing data and projects, templates, Python, installation without disks (download). More details are available at: http://www.esri.com/software/arcgis/whats-new/index.html

▪ Elizabeth Hirsh, Aurora Community College: Report on NSF Grant

Elizabeth presented the status of their NSF-funded project at the Community College of Aurora (CCA). The project titled “Community College GIS Faculty Institute,” emphasizes the use of GIS in multiple disciplines. The project offers training institutes to faculty members from across campus in the application of spatial technologies for use in the classroom. Institute participants have developed lessons in diverse fields including archaeology, math, English, among others. The intent is that students will be exposed to GIS in diverse applications thereby generating interest and increased demand for GIS courses. Contact: elizabeth.hirsh@ccaurora.edu

▪ Irina Kopteva and Student Ambassadors, PPCC, NSF Grant

Irina and Student Ambassadors shared their experiences in promoting GIS/spatial technologies to different audiences, including high school students. In general, high school students are unfamiliar with these technologies and therefore do not know to ask about them when moving on to college. Increasing exposure to GIS at the K-12 level may in turn increase demand at the higher ed. level. PPCC Student Ambassadors commented on their own experience in the program—favorite courses, most worthwhile projects, real-world applications, support and patience from instructors, internship opportunities, etc. Discussion about 4-H groups—a good potential area for exposing youth to GIS/GPS, etc.

▪ Paddington Hodza – University of Colorado, Colorado Springs, Geospatial Program
Paddington presented his experience in developing geotechnology courses at UCCS over the past three years. His intent is to make geotechnology the ‘glue’ that holds the human and physical sides of the geography department together. He now offers a required 200-level course entitled “Digital Earth” as well as Internet GIS and Programming GIS. He strives to present ‘cutting edge’ issues in geography; geovisualization (in lieu of cartography); and enable students to develop skills as well as knowledge. Contact: phodza@uccs.edu

**PANEL: Are GIS graduates prepared for the workforce? Are they ready to hit the ground running?**

- Llana Hines, Sanborn Mapping
- Roger Clarke, Peterson AFB
- Jerry Cordova, City of Fountain
- Phil Friesen, City of Colorado Springs
- Joel Hanson, Douglas County
- Ben Sloboda, El Paso and Teller County E-911 Authority
- Jessica Touchard, GeoSearch, Inc.

List of qualities employers are looking for:

- Ability to use software
- Understand and organize database files and structures; database manipulation; attribute management
- Teamwork & attitude
- Cartography skills
- Editing and advanced editing
- Topology
- Raster vs. vector
- Visualization
- Basic IT literacy; Communication
- Python/ Model builder; VB, .NET, Java, Flex
- Programming
- Critical thinking; attention to detail; humility and curiosity
- Experience; knowing how to problem solve and work independently
- Theory and spatial literacy
- Project management (advanced level)
- Spatial SQL and/or Oracle
- Version editing
- Scripting; ability to automate repeatable processes
- ArcGIS Server and web mapping
- Industry doesn’t necessarily expect academia to keep up—just TRY, and have good solid foundation, problem solving skills, curiosity. Direct students towards their preferences and their talents—so many options for employment at different levels.
- Keep learning
- Data standards
- Know what your data represents: Go outside!
- Make resumes ‘living’—links to projects, updates
- Expose students to different data types
- Issue of SCALE—use appropriate scale data for projects
- Software: ESRI products, Google, CAD, digital globes, ERDAS,
- Train students for the LOCAL needs; ensure communication between industry and education
- Put data to good use; SOLVE problems, don’t just deliver data
- Domain/discipline expertise
- Unrealistic for students to come out completely “trained and prepared”
- We need to use local knowledge, problem solving, cartography, teamwork and a combo of physical and human geography to be effective.
• Action item thought from Sophia (post-Summit): We’ve had three panels like this over the past year. It may be time to consolidate and organize these ‘laundry lists’ to look for commonalities, consensus, etc., and then distribute more widely.

**Break-out Discussion Sessions:**

1. **Curriculum and Course Work – Follow Up from 2009 Summit**  
   (Scope of GIS Coursework, Consistency of GIS Programs, Overlapping Coursework/Gaps in Coursework, Associates degree vs. Bachelor degree)

   • Use the “Body of Knowledge” as a guideline for what classes to offer and what content should be covered.  
     o Lay out learning goals and build courses  
     o Backing up GIS &Tech as a discipline: What do we bring to the education table?

   • What does a 4-year institution look for from a 2-year student? (4-year to grad student as well)?  
     o Keep syllabi and projects (like a portfolio) so courses transfer

   • If institutions follow the “Body of Knowledge” then more courses will transfer

   • What skills are expected of Associates and Bachelor degrees in GIS?  
     o How does the rigor differ?  
     o What are the defining factors?  
     o What is the value of an internship?

   • Our scope is too small to only include GIS – need to expand and broaden horizons

   • Infuse problem solving (real world) of applying technology  
     o What is the path: problem – research – process – solving issues – results – thinking skills  
     o Use ‘meaty’ case studies as a teaching tool – leave the answers open ended and make students get there.

   • Labor department setting standards of what is expected from each ‘level’ of GISer

**Division of Expectations**

<table>
<thead>
<tr>
<th>Spatial Literacy</th>
<th>Associate Degree</th>
<th>Bachelors</th>
<th>Advanced degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needs to be part of core classes</td>
<td>Set of tools</td>
<td>Think in a spatial way</td>
<td>Handle on both Assoc. and Bachelor</td>
</tr>
<tr>
<td>Not just data - problems &amp; solutions</td>
<td>data</td>
<td>info</td>
<td>Info + data = value added = $$</td>
</tr>
<tr>
<td>Using Digital Earth as an interesting and cool way to ‘grab’ people’s attention</td>
<td>Technician</td>
<td>Analyst</td>
<td>Project management</td>
</tr>
</tbody>
</table>

• Action items: Begin GIS integration across curriculum  
  o Adopt a professor from another department  
  o Get Spatial Literacy taught as a core curriculum – reach the broader audience – funnel people in, and then back out to their specific interests.

2. **K-12 Developments, GIS in K-12, K-12 Outreach**

There is a great deal of competition in high school regarding what needs to be taught. Exposure to geotechnology should be minimal goal; integration into existing classes. “20-minute GIS for Young Explorers” will be published soon; a time filler when a teacher has a free few minutes. Many online mapping tools for short exposure (worldmapper.org). GIS should help solve problems, not make new ones. COGA held excellent workshops; good for schools with site licenses.
There seem to be two types of teachers who adopt GIS: 1) science teachers who are not afraid of ‘messy’ stuff without clear answers, and 2) 15-year teachers who are looking for something new, challenging and interesting.

Career paths are sometimes determined at 6th or 7th grades. Must engage school counselors—who can be your friend, or not... Some try to make it too easy for students, instead of truly challenging them to try something beyond their comfort zone.

Possible Action Item: Statewide GIS Day event—bring students and teachers to one venue to explore GIS, etc. (Question: Was she aware of GIS Day activities in November when she proposed this event? It could coincide.)

3. **Course articulation: K-12 to Community College to University**

Career Pathways. It may be time to articulate a “career pathway” for GIS. What are we preparing students for? What skills do they need for which occupation? The community colleges have a framework for developing this. It can definitely help with course articulation and transfer among colleges/universities. Part of Career and Tech Education. Community colleges have competencies for GIS, but they’re out of date. May be time to revisit.

**Final Remarks**

Communication: Currently we just have the email list for the time being. Should we create a listserve? Or just have wiki/community blog on CSU’s GIS in Higher Ed website for now?

Two-to-Two Conference in Fall?

Next meeting: In coordination with GIS in the Rockies meeting in September.

Next spring: Community College of Aurora is willing to host, but earlier in spring to avoid end of semester conflicts.

---

**Mini Workshop and Teaching Materials on Map Analysis and Modeling** (Joe Berry)

Joe presented methods for engaging students in learning about vector vs. raster representations, and emphasizing the need for analysis and problem solving. His materials are available by request from Joe: jberry@innovativegis.com

Website: [http://www.innovativegis.com/basis/](http://www.innovativegis.com/basis/)