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A Spatially-enabled Smart Campus for Community-based Learning

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A spatially-enabled smart campus for community-based learning

Jennifer Fu
GIS-RS Center
Florida International University

Three Layers of Community-Based Learning Environment

- Smart Campus – Infrastructure
 - ❑ Spatially Enabled Campus Information Systems
 - ❑ Routing, Navigation, Resource Locating and Discovery
- Curriculum – Spatially-Enabled, Multi-disciplinary, from Distance
 - ❑ GIS is for every student;
 - ❑ A Library-based GIS Center for Campus GIS Community (FIU)
 - ❑ GIS Distance Education and Reusable Learning Objects (UF)
- VGI Tools for Community-Based Learning – Local and Global
 - ❑ Local – Digital Humanity, History
 - ❑ Global – Disaster Reduction, Water Resources, Climate Change

Smart Campus and Student Learning

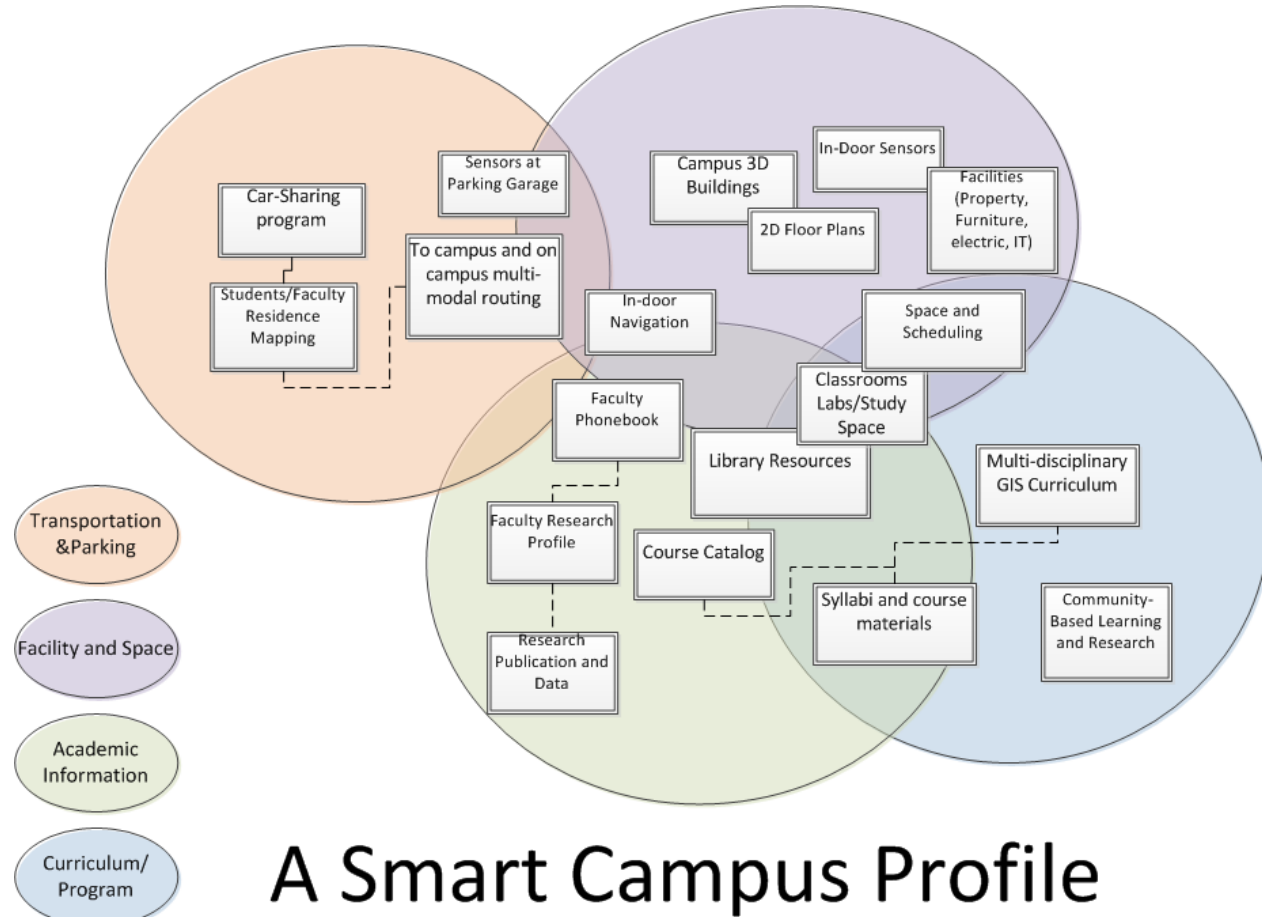


Active Learning Happens When Students Participate

Learning Starts From Campus

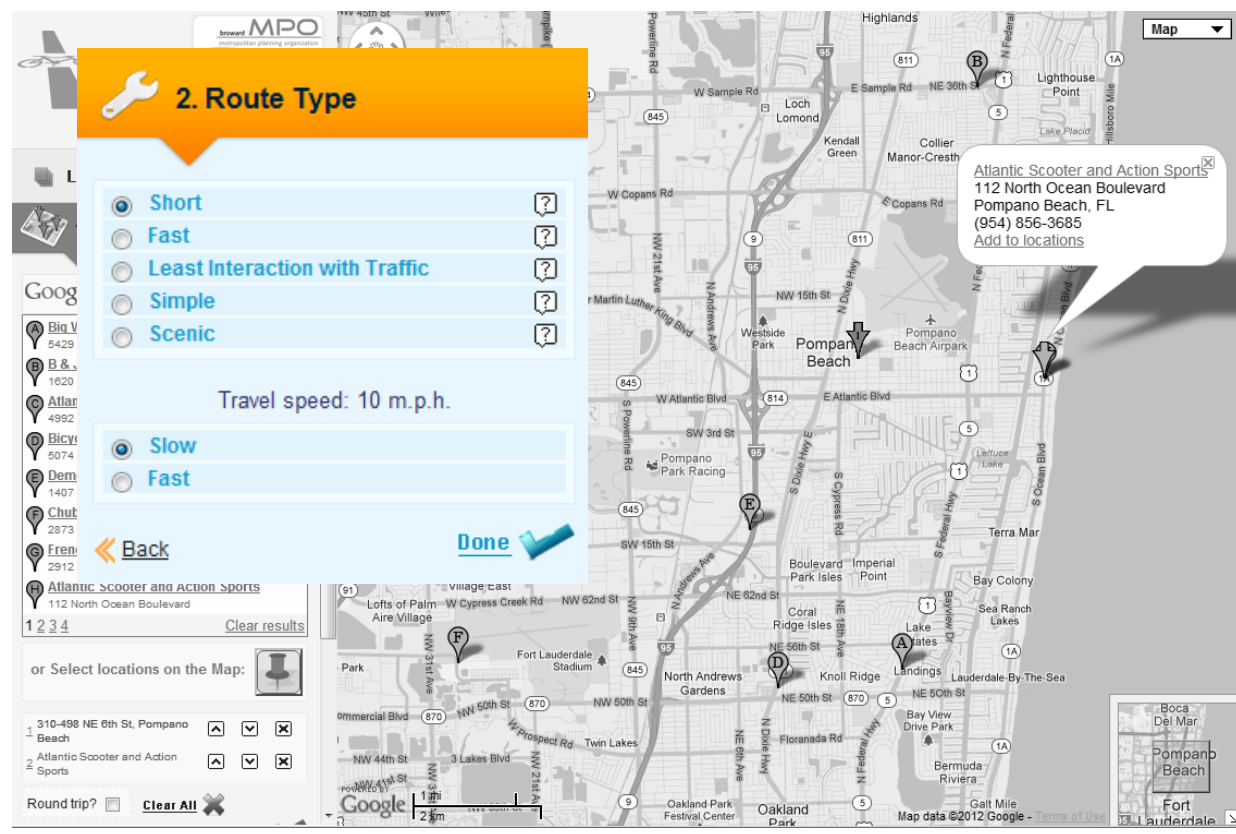
Smart Campus – Infrastructure

Several aspects of campus can be spatially enabled



Smart Campus – Transportation / Routing

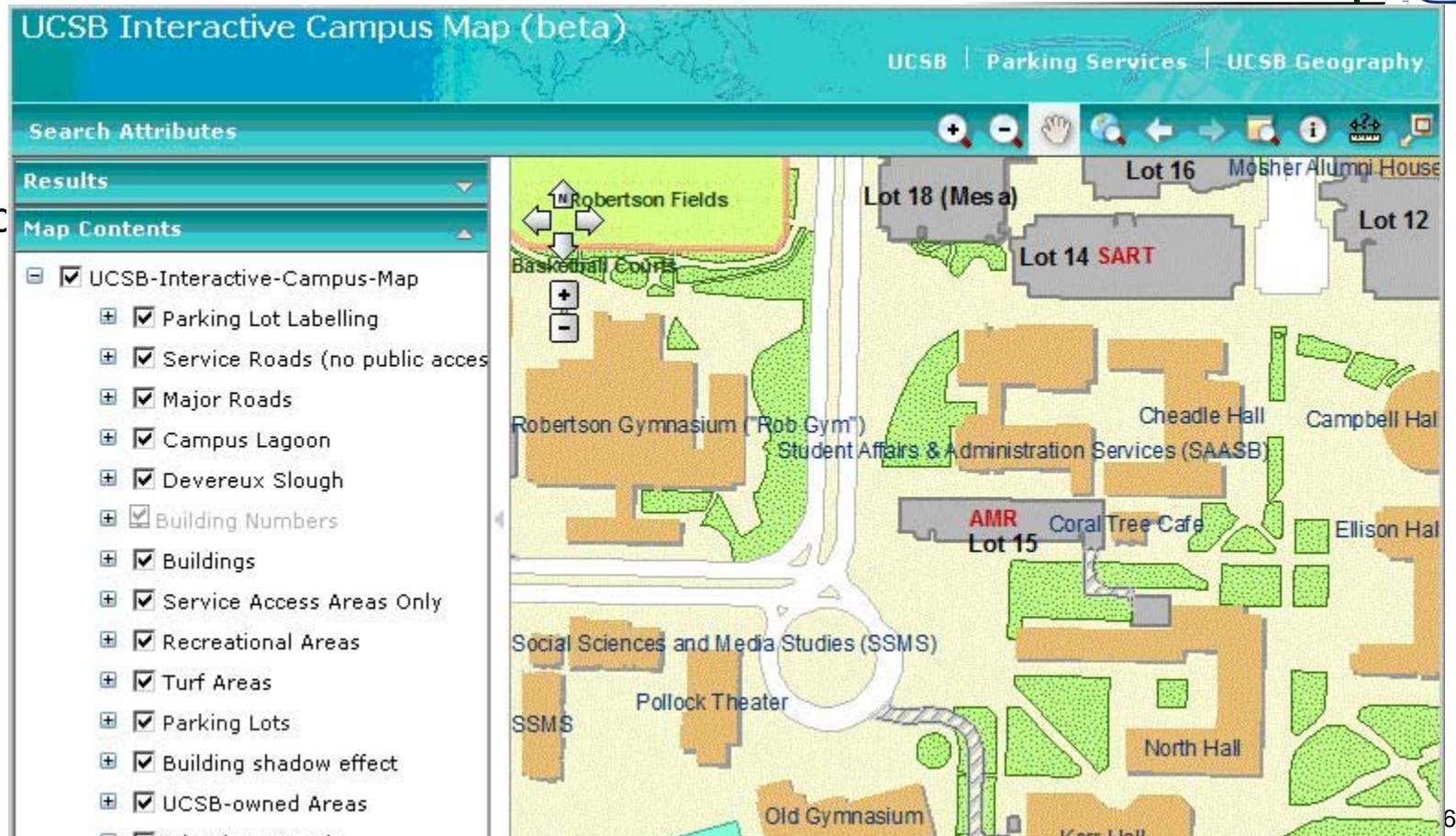
Bicycle and Pedestrian Routing tools To encourage A greener, safer way of to and in campus travel



The screenshot shows a Google Maps interface with a routing overlay. An orange banner at the top reads "2. Route Type" with a wrench icon. Below it, a list of route types is shown: Short (selected), Fast, Least Interaction with Traffic, Simple, and Scenic. A "Travel speed: 10 m.p.h." is indicated. Below the list are "Slow" and "Fast" options. A "Back" button is on the left and a "Done" button with a checkmark is on the right. The map shows Pompano Beach, FL, with a route highlighted in blue. A callout box for "Atlantic Scooter and Action Sports" is visible, providing the address "112 North Ocean Boulevard" and phone number "(954) 856-3685". The interface also includes a sidebar with location pins and a "Round trip?" checkbox.

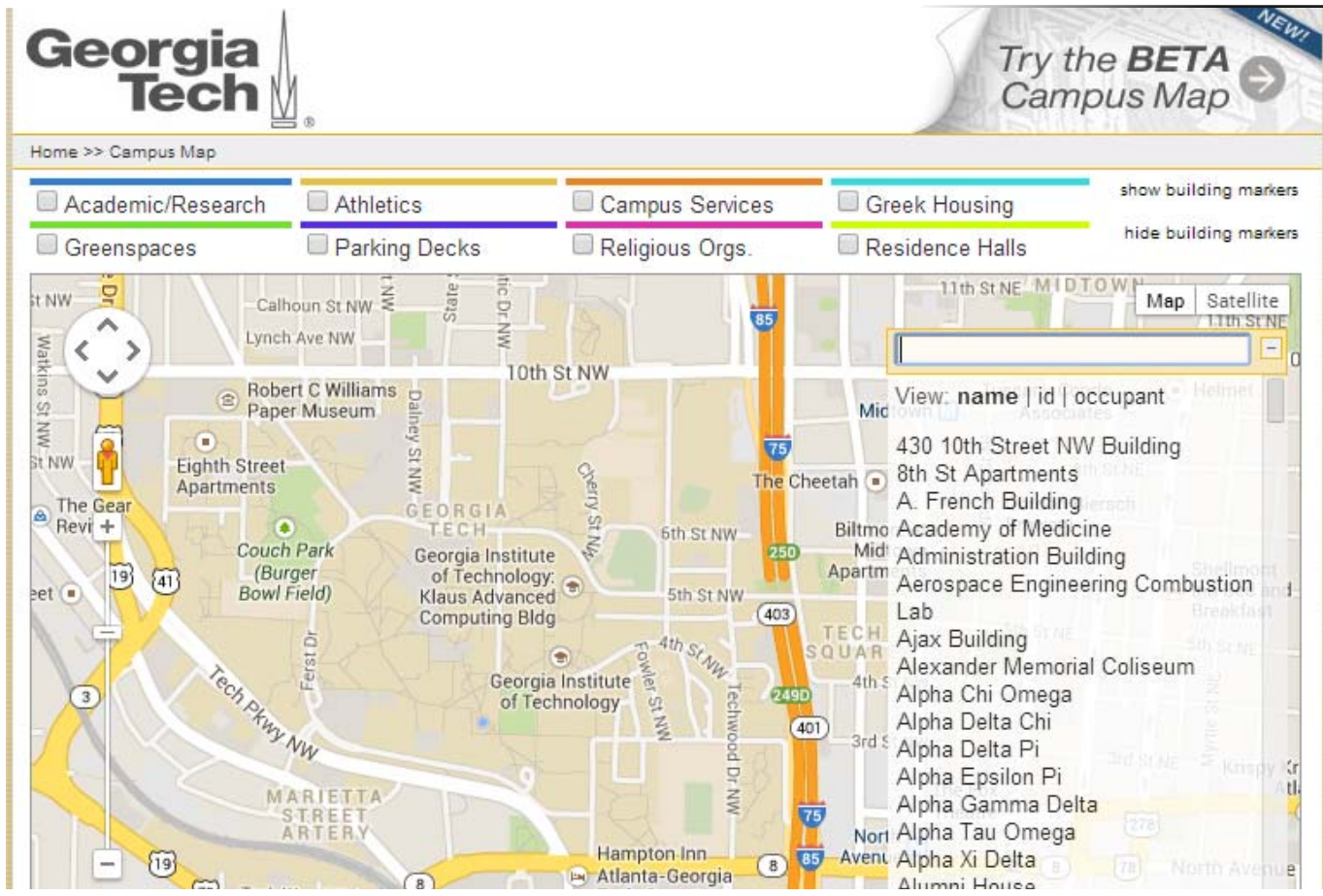
Smart Campus: Facility and Sustainability


UCSB –
Interactive
Campus Map
(created by
students):
Way-finding;
accessibility
elements;
time-aware
layers



Smart Campus: Space and Sustainability

Georgia Tech – Green Space Identification using interactive mapping



Georgia Tech Try the **BETA** Campus Map 

Home >> Campus Map

<input type="checkbox"/> Academic/Research	<input type="checkbox"/> Athletics	<input type="checkbox"/> Campus Services	<input type="checkbox"/> Greek Housing	show building markers
<input type="checkbox"/> Greenspaces	<input type="checkbox"/> Parking Decks	<input type="checkbox"/> Religious Orgs.	<input type="checkbox"/> Residence Halls	hide building markers

Map Satellite

View: name | id | occupant

- 430 10th Street NW Building
- 8th St Apartments
- A. French Building
- Academy of Medicine
- Administration Building
- Aerospace Engineering Combustion Lab
- Ajax Building
- Alexander Memorial Coliseum
- Alpha Chi Omega
- Alpha Delta Chi
- Alpha Delta Pi
- Alpha Epsilon Pi
- Alpha Gamma Delta
- Alpha Tau Omega
- Alpha Xi Delta
- Alumni House

Smart Campus: Integration and Participation

University
Jaume I (UJI)
of Castellón
(Spain)

ESRI
technology
Computer
Science
Faculty
Student
involvement


<http://smart.uji.es/smartUji/>



Search: 'water ' :

We found 74,930 matching items at Florida International University

Limit by: Publication Year or Popular Format

Show 230,307 items that you can request statewide  (what's this?)

Narrow Results By:


Books in the library

Library/Collection

- FIU Green Library Documents (16,271)
 - FIU Online (10,270)
 - FIU Green Library (6,356)
- show more...

Format

- Book (70,345)
- Govt Publication (58,335)
- Online Resource (47,408)

 My Folder is empty

Add All

Results/page: 10

Sort By: Relevance



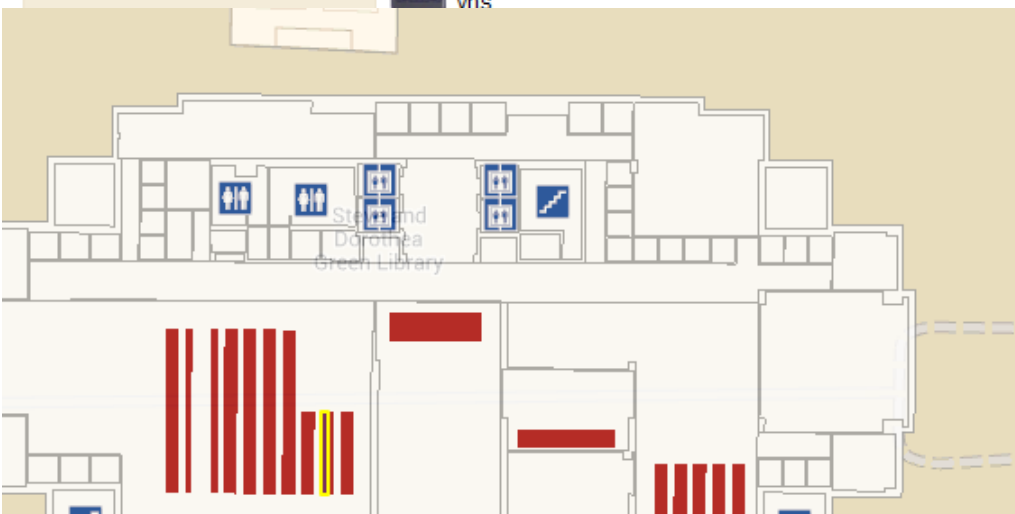
1 2 3 4 5 6 7 8 9 10 Next >>


1. Water

produced by Peter Pastorelle Productions for Maryknoll Missioners.

Published: Maryknoll, N.Y. : Maryknoll World Video Library, 1980.

Summary: Deals with the problems of the Third World countries and their quest for pure water, emphasizing that a fresh water supply is an essential element for quality of life and dignity for all people.



D353 .D48 1980  Available (14-Day Loan)

SHARE

on, 2006.
like most families in the countryside, they don't have running

employees

SHARE

Curriculum and Beyond

Increased Geo-spatial Awareness on Campus

Coordinated Learning Environment and Curriculum

Distance GIS Learning

Geo-spatial Workforce Development

Staff

GIS Advisory Committee

Draft Constitution

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Zhaohui (Jennifer) Fu	Committee Co-Chair	GIS Center	fujen@fiu.edu	GL 273-C

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Dr. Xia Jin	Civil and Environmental Engineering		xjin1@fiu.edu	EC 3603

Geo-spatial training and informal ed

GIS Center at FIU : <http://gis.fiu.edu>

Routine free workshops for all interested students –
topics ranging from Intro to GIS, GPS, Census
Mapping, etc;

ESRI's Virtual Campus training;

GIS guest lectures to support non-GIS curriculum
(e.g Journalism, Architecture);

One-to-one consultation

Geo-spatial workforce development

GIS Center at FIU : <http://gis.fiu.edu>

90% of 10-15 GIS Center's employees have a FIU degree;

99% of student interns who worked at GIS Center find salaried positions within the first year of graduation; Or continue on graduate degree in geo-spatial sciences;

External funding allow hiring of graduate students;

Matching GIS students with internship outside FIU community;

GIS Center trained 400+ Miami Dade County employee on basic GIS technology;

Distance Learning Programs in GIS (UF)

- > Video-conferencing,
- > web conferencing,
- > e-Learning management systems
- > instructional videos on mobile devices

Distance Education Development

The University of Florida Geomatics program has embraced digital technologies to make efficient use of teaching resources and to unify the geographically dispersed student body. A program wide integration of videoconferencing (Fig. 2), web conferencing (Fig. 3), e-Learning management system (Fig. 4), and instructional videos for hand-held devices (e.g., iPhones) has enriched the student experience and the facilitation of learning for GIS students not only across the state of Florida but across the world. Further, students are able to participate synchronously or asynchronously (Fig. 5) allowing flexibility for student schedules.



Fig. 2 - All Geomatics classrooms are equipped with state-of-the-art Polycom videoconferencing equipment.

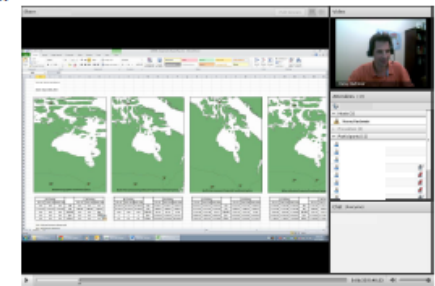


Fig. 3 - Adobe Connect, a web conferencing software, is utilized in courses to facilitate students showing class assignments through desktop sharing and to increase interaction between instructors and students working with geospatial software packages (e.g., ArcGIS, ENVI).



Fig. 4 - Sakai is the e-Learning course management software that Geomatics courses utilize for organizing course resources, collaborating on discussion prompts, and administering low stakes quizzes for reinforcement of lecture concepts.

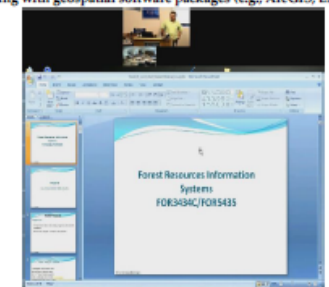


Fig. 5 - Full-time working students watch lecture recordings asynchronously. Office hours and discussion boards are used to clarify lecture concepts for asynchronous students.

Reusable Learning Objects (RLOs)

Lego pieces as learning objects and topics, such as:
 Topographic Maps;
 Coordinate Systems;
 Datums;
 and LiDAR

Reusable Learning Objects

To enhance the student learning experience, instructors have developed numerous peer-reviewed Reusable Learning Objects (RLOs). Each RLO is a digital lesson stored in a central repository (e.g., EcoLearnIT - <http://ecolearnit.ifas.ufl.edu/>) that focuses on one primary learning objective. These RLOs break down complex subject matter into clear and concise presentation material suitable for viewing on an as needed basis. To enhance the learning experience in GIS courses (Fig. 6 & Fig. 7), instructors in the Geomatics program have created a series of RLOs covering topographic maps (coordinates/elevations), coordinate systems, datums (vertical/horizontal), projections (cylindrical/conic, azimuthal), and LiDAR (principles/data sources/applications).

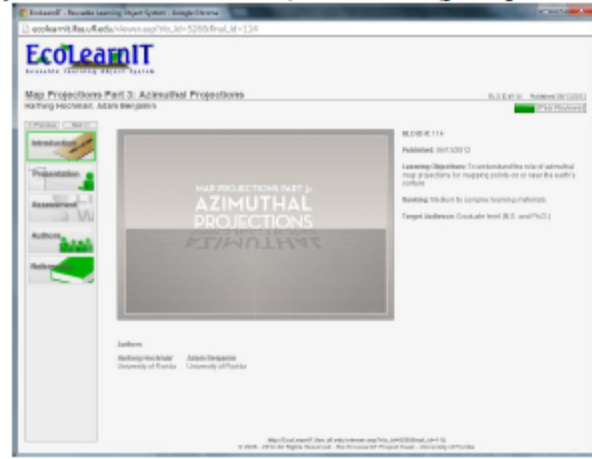


Fig. 6 - Typical GIS RLO showing publication status, learning objectives, ranking (i.e., material complexity), and target audience

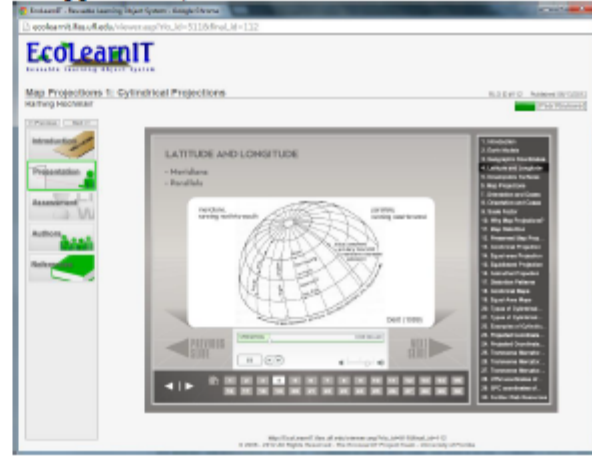


Fig. 7 - Typical GIS RLO presentation showing navigation menu

VGI learning tools – Local to Global

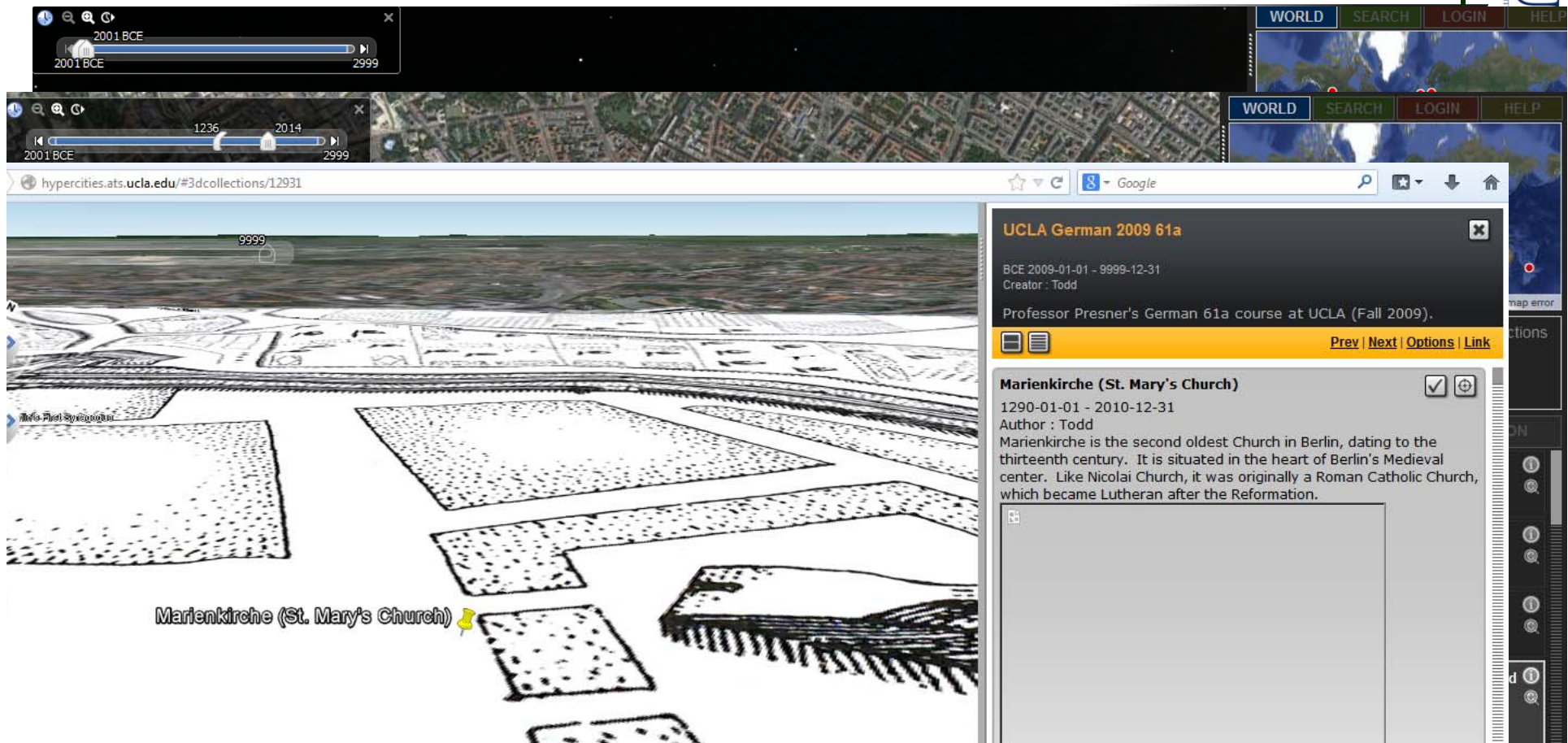
Increased Geo-spatial Awareness on Campus

Coordinated Learning Environment and Curriculum

Distance GIS Learning

Geo-spatial Workforce Development

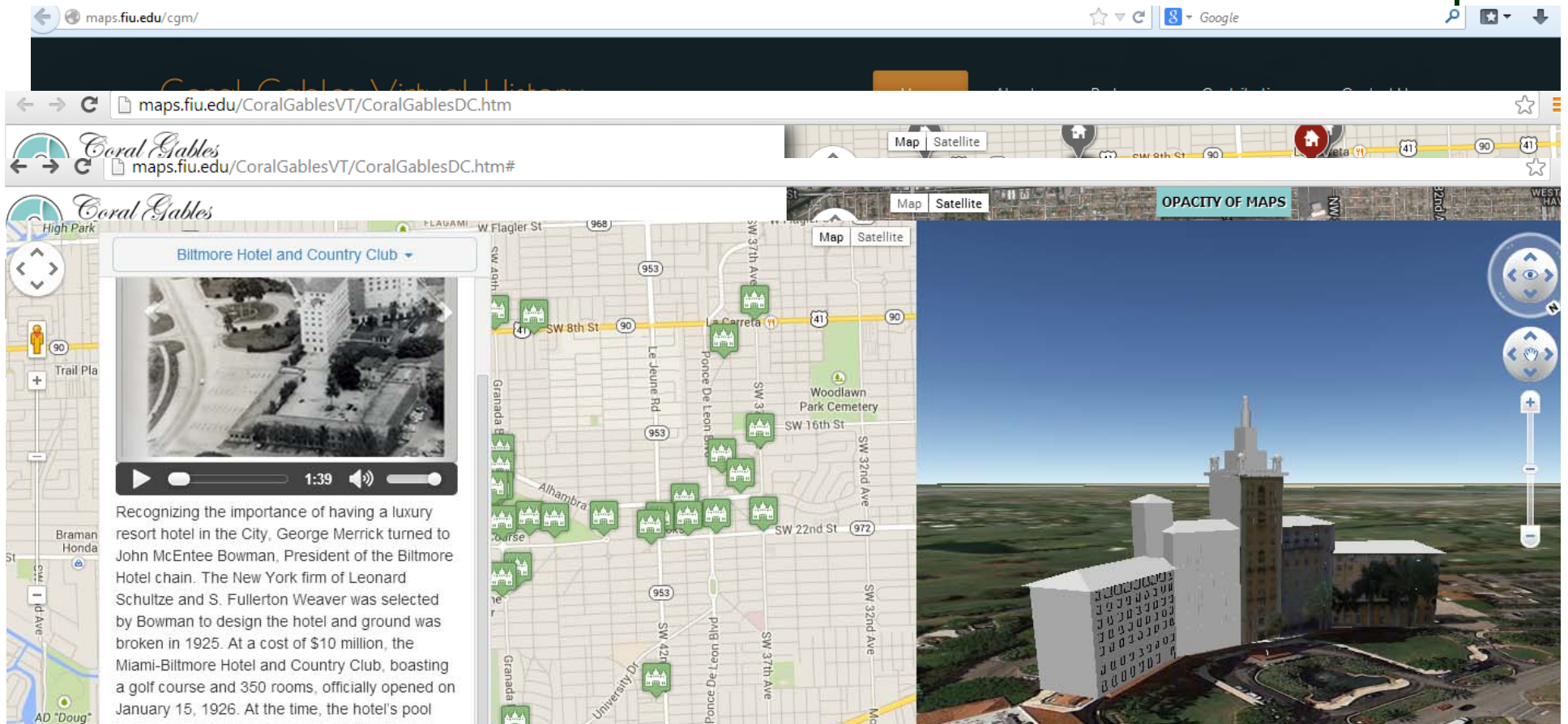
Web GIS tools for Digital Humanity



The screenshot displays a web GIS application interface. At the top, there are navigation tabs for 'WORLD', 'SEARCH', 'LOGIN', and 'HELP'. Below these, a timeline slider is visible, ranging from 2001 BCE to 2999. The main view shows a 3D reconstruction of a city with a grid-like street pattern. A yellow arrow points to a specific building labeled 'Marienkirche (St. Mary's Church)'. On the right side, there is an information panel with the following details:

- UCLA German 2009 61a**
BCE 2009-01-01 - 9999-12-31
Creator: Todd
Professor Presner's German 61a course at UCLA (Fall 2009).
- Marienkirche (St. Mary's Church)**
1290-01-01 - 2010-12-31
Author: Todd
Marienkirche is the second oldest Church in Berlin, dating to the thirteenth century. It is situated in the heart of Berlin's Medieval center. Like Nicolai Church, it was originally a Roman Catholic Church, which became Lutheran after the Reformation.

Local Community Learning and Engagement

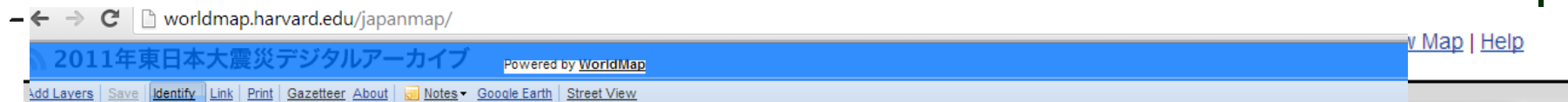


The screenshot displays a web browser window with the URL maps.fiu.edu/CoralGablesVT/CoralGablesDC.htm. The page features a map of Coral Gables, Florida, with several green house-shaped markers indicating the locations of Biltmore hotels. A video player is embedded on the left side of the map, titled "Biltmore Hotel and Country Club", showing an aerial view of the hotel complex. Below the video player, a text block provides historical context:

Recognizing the importance of having a luxury resort hotel in the City, George Merrick turned to John McEntee Bowman, President of the Biltmore Hotel chain. The New York firm of Leonard Schultze and S. Fullerton Weaver was selected by Bowman to design the hotel and ground was broken in 1925. At a cost of \$10 million, the Miami-Biltmore Hotel and Country Club, boasting a golf course and 350 rooms, officially opened on January 15, 1926. At the time, the hotel's pool

The map interface includes standard navigation controls such as "Map" and "Satellite" views, a compass, and a street view pegman. The video player includes a play button, a progress bar at 1:39, and a volume icon.

Web GIS tools for Global Learning



[Sign in](#) | [Create Map](#) | [View Map](#) | [Help](#)



Search For Maps

About

Art Scenes in Berlin 1971-1999

The Harvard WorldMap Project

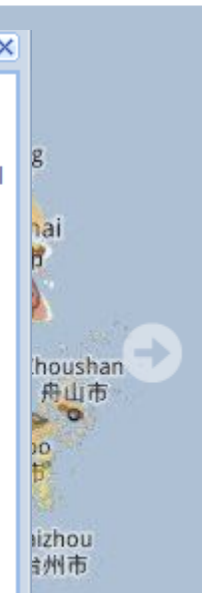
WorldMap is an open source web mapping system that is currently under construction. It is built to assist academic research and teaching as well as the general public and supports discovery, investigation, analysis, visualization, communication and archiving of multi-disciplinary, multi-source and multi-format data, organized spatially and temporally.

The first instance of WorldMap, focused on the continent of Africa, is called AfricaMap. Since its beta release in November of 2008, the framework has been implemented in several geographic locations with different research foci, including metro Boston, East Asia, Vermont, Harvard Forest and the city of Paris. These web mapping applications are used in courses as well as by individual researchers.

Introduction to the WorldMap Project

WorldMap solves the problem of discovering where things happen. It draws together an array of public maps and scholarly data to create a common source where users can:

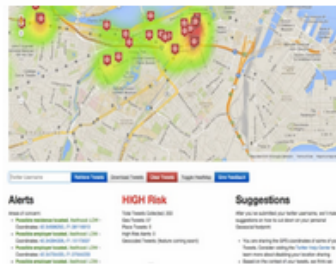
1. Interact with the best available public data for a city/region/continent
2. See the whole of that area yet also zoom in to particular places
3. Accumulate both contemporary and historical data supplied by researchers and make it permanently accessible online
4. Work collaboratively across disciplines and organizations with spatial information in an online environment



Student Participation and Creation (AAG)

- <http://mappingideas.sdsu.edu/mashup/Voting/vote.html>

1.



GeoSocial Footprint

URL: <http://geosocialfootprint.com/>

Youtube Intro: [Link to YouTube](#)

Authors: Chris Weidemann

School: University of Southern California

[Click to see description](#)

2.



NYC Cool Roofs MapClimate Change

URL: <http://www.carsilab.org/coolmap/>

Youtube Intro: [Link to YouTube](#)

Authors: Gordon Green - Group

School: Hunter College / CUNY

[Click to see description](#)

3.



Country Based Migration Map

URL: <http://migrationmap2010.appspot.com/>

Youtube Intro: [Link to Utube](#)

Authors: Jie Zheng - Group

School: Wuhan University