Integrating GIS Research into the Geography and Geospatial Undergraduate Student Experience

American Association of Geographers
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USC Spatial Sciences Institute
Who we are

- law
- human geography
- soil science
- architecture
- urban planning
- preventive medicine
- computer science
- political science
- economics
- evolutionary biology
- oceanography
- global health
- industrial and systems engineering
- history
- sociology
- political geography
- landscape architecture
- public policy
- international relations
- civil and environmental engineering

USC Dornsife
Dana and David Dornsife
College of Letters, Arts and Sciences

Spatial Sciences Institute
## SSI’s Undergraduate Geospatial Curriculum

### Majors
- B.S. in GeoDesign
- B.S. in Global Geodesign
- B.S. in Human Security and Geospatial Intelligence

### Minors
- GIS and Sustainability Science
- Human Security and Geospatial Intelligence
- Spatial Studies

### GE Courses
- Maps in the Digital World
- Sustainability Science in the City
- Human Populations and Natural Hazard
- The Water Planet
Four-Course GIS Sequence

301L: Maps and Spatial Reasoning

381: Statistics for the Spatial Sciences

382L: Principles of GIS

383: Geospatial Modeling and Customization
# SSI’s Graduate Geospatial Curriculum

## Graduate Certificates
- Geographic Information Science and Technology
- Geospatial Intelligence
- Geospatial Leadership
- Remote Sensing for Earth Observation (Fall 2019)

## M.S. Degrees
- Geographic Information Science and Technology
- Human Security and Geospatial Intelligence
- Spatial Data Science
- Spatial Economics and Data Analysis

## Specializations
- GeoHealth | Master of Public Health
- GIS | Transportation Systems Management

## Doctoral
- Spatial Analytics Graduate Certificate
- Ph.D. in Population, Health and Place
SSI Computational Infrastructure
The Boyer Commission on Educating Undergraduates in the Research University

REINVENTING UNDERGRADUATE EDUCATION:
A Blueprint for America's Research Universities

http://notes.cc.sunysb.edu/Pres/boyer.nsf
Undergraduate Researchers
Critical Spatial Thinkers
Nature of faculty profiles

Lack of student awareness of research opportunities

Lack of faculty awareness of student interest and capabilities

Lack of funding for undergraduate student research

Lack of student awareness of benefits
Funding Sources: Research Grants
Funding Sources: Gifts
Funding Sources: University Programs

Dr. Jennifer Swift and Dr. Darren Ruddell
Associate Professors (Teaching)
“The Catalogue” and “The Match”

2018 - 2019 Projects

“Automatic Generation of Long-term and Large Geospatial Data from Historical Maps”

“Impact of land use policy on urban development and human-environment systems change in Los Angeles County”

“Coast Light: Actionable Science to Manage Coastal Nightscapes”

“Los Angeles Regional Open Space and Affordable Housing Joint-Development – Site Identification and Analysis”
2018 - 2019 Projects, continued

“Smallsat Human Security Monitoring System”

“Urban Development and Inequality in India”

“’Superblocks’ for Los Angeles? — Sustainable Urban Alternatives Evaluated with GeoDesign”

“City of Los Angeles Generation of Wealth and Business Growth”

“Assessing residential soil lead contamination using geospatial analysis in Southeast Los Angeles County, California”
Culture
Outcomes: 2018 survey comments

“It definitely enhances my curriculum and it's a cool experience to be able to apply what you learn in class to the real world.”

“It's been very interesting. . . . [We have been ] allowed to develop our own framework which has been an amazing experience as well as a challenging one which has definitely shaped my college experience.”

“Very very rewarding; comes with big results.”

“Overall, I really enjoyed it. It helped me apply my class learning to solve real world problems, and develop close relationships with faculty and fellow students.”
Outcomes: 2018 survey comments

“[The faculty and staff PIs] were phenomenal research leads, and I am grateful to have been able to work alongside them, learning from their various areas of expertise. I am proud of my work, and it is a great addition to any resume.”

“It has been a great way to understand how to implement GIS and present data to people who are not familiar with GIS programs.”

“Participating in research in SSI has been potentially the most meaningful opportunity I've had at USC. It has helped set me up for professional work and been one of my favorite uses of my time!”

“I am very happy that I took the chance to apply for a research position. I've learned so much and feel much more comfortable around GIS software. I am more confident about performing analysis on spatial data and figuring things out by myself.”
Outcomes: presentations
Outcomes: awards
Outcomes: awards

Boren Awards

Fulbright

The Phi Beta Kappa Society

The Nation's Oldest Academic Honor Society

Founded December 5, 1776

USGIF

Build the Community
Advance the Tradecraft
Accelerate Innovation

The Imaging & Geospatial Information Society

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Spatial Sciences Institute
Outcomes: student-authored publications
Outcomes: internships and jobs
Faculty limitations
Advancement limitations
Longitudinal assessments
Alumni engagement
Biofeedback to curriculum
“I have truly enjoyed my research experience, and therefore am very grateful that SSI provides opportunities for students to apply what they learned in class to the field and, in my case, see my work make a tangible impact.”
Thank you!

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