

UC Santa Barbara

Center Reports

Title

Imagine a Nation of Spatial Thinkers

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But so much more needs to be done

We need philanthropic support to:

- Research and develop a best-practices curriculum in spatial thinking. This would require approximately three years for hiring additional staff, holding workshops, and testing and revising the curriculum.
- Develop ways to ensure that spatial thinking is broadly and effectively taught from kindergarten through high school.
- Bring top faculty to UCSB in a wide range of disciplines to research and teach the application of spatial thinking in their fields.
- Fund internships and scholarships for undergraduate and graduate students, enabling them to study spatial thinking and its application to a wide range of disciplines.
- Develop new methods to preserve the vast array of digital spatial data for the next 100 years and facilitate ways to link massive data sets.
- Apply spatial acumen to challenging issues, such as health care access, geopolitical strife, and issues of equity.
- Continue to build the reputation and scope of **spatial@ucsb** through national and international conferences and workshops.

Spatial technologies such as GIS can be applied to a huge range of problems and opportunities to reveal previously unseen patterns and trends.



To learn more about how your support can make a difference, please contact:
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spatial@ucsb
perspectives for teaching and research



Imagine a nation of spatial thinkers

Spatial thinking **TRANSFORMS** the way we solve problems.

It shows us **SOLUTIONS**.

It opens up new **POSSIBILITIES**.

It leads to new **CONNECTIONS** in sciences and the arts.

Tapping the potential of spatial thinking is the mission of **spatial@ucsb**, the leading center devoted to the possibilities of analyzing, understanding, and describing the world in multiple dimensions.

Most of us have been taught to think and talk about the world using words, lists, and statistics. These are useful tools, but they do not come close to telling the full story. Thinking spatially opens the eye and mind to new connections, new questions, and new answers. It can be as simple as taking economic or demographic data off tables and putting them on a map. It can be as complex as positing new physical laws in five or more dimensions. Spatial thinking gives us the crucial awareness of where things and people are, what surrounds them, what is near, and what is far. Spatial thinking also can link disciplines, such as literature and mathematics, biology and computation, or geography and cinematography. Spatial thinking offers solutions to the world's most pressing issues and is the key to powerfully creative problem-solving techniques.



Cholera incidence, from Snow

Spatial thinking literally can save lives. It did so during an 1854 cholera epidemic in London. The deadly disease was spreading, but experts had not identified the cause. John Snow, a surgeon, decided to draw a map of the new cases of cholera in a London neighborhood during one week. He also marked key details about the area, such as the locations of buildings, water sources, streets, and the like. By plotting these facts on a simple map, Snow realized there were a large number of cases near a single, centrally-located water pump.

By identifying contaminated water as the source of the problem—even before the water was analyzed—Snow suggested a simple action: Close the **contaminated pump**. As Snow predicted, the incidence of new cases then fell dramatically. It was through his application of spatial thinking that the epidemiology of cholera was understood and the disease curbed.

Many have followed in Snow's footsteps since then, bringing spatially-based sciences such as epidemiology, geography, and geology to high levels of analytic power and sophistication. Some fields are just starting to discover what spatial thinking can do for them. With the development of new tools for gathering and organizing information spatially, spatial thinking is now more accessible for visualization and analysis. Thanks to the work of centers such as **spatial@ucsb**, the potential of spatial thinking is now being recognized in virtually every discipline, from nanotechnology to psychology, from political science to urban planning.

spatial@ucsb promotes spatial literacy

What is spatial literacy? For one thing, it is the ability to apply concepts like height, depth, and distance to comprehend the natural and social universe. The concept of spatial thinking isn't new, though the identification of the need to promote spatial literacy is.

Introduced early in a student's education, the development of spatial literacy can open new doors to learning and help unveil the complexity and dynamics of real-world problems. At the university level, spatial technologies such as geographic information systems (GIS) can be applied to a huge range of problems to reveal previously unseen patterns and trends. Insights from seemingly unrelated disciplines—black studies and computer science, for example—can be applied to emerging questions.

spatial@ucsb is already making a difference

The creation of **spatial@ucsb** is helping to catalyze global interest in integrating spatial thinking into a host of disciplines for teaching and research.

- It is helping educators to identify what curricula and resources are needed to better teach spatial thinking.
- It is stimulating research on tools for and applications of spatial thinking.
- It is encouraging disciplines at UC Santa Barbara and beyond to consider how the application of spatial thinking will enhance their teaching and research.
- And it is bringing together the world's leaders in spatial thinking through research seminars, workshops, and other events.