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Confluence of Trends and Issues Actuates a Path for Geodesign Education

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The Cleveland Clinic

The [Cleveland Clinic](#) of Cleveland, Ohio, is recognized as a model for the future of health care. It has forged an innovative approach to patient diagnosis, which not only provides exciting results but also saves money. The approach required a cultural shift in how health care systems operate. "Health care has gone from a single sport to a team sport," says Dr. Delos M. Cosgrove, the CEO of the Cleveland Clinic. This is fueled by the belief that "collaboration has always, and will always, further discoveries in science and medicine."

While the Cleveland Clinic has disease-specific institutes that facilitate collaboration among physicians to address some of the most vexing medical problems, geodesign is providing a cultural shift in how geographic and spatial information can be used to address some of the most complex challenges facing the environment. In the case of geodesign, the future of environmental care is the collaboration of science and design.

Intellectual Jazz

The idea of marrying scientific and design thinking is really not new, but the possibilities and rewards are becoming more widely sought and valued. Over a decade ago in his book *Consilience*, E. O. Wilson urged us to consider that the most challenging issues facing humanity cannot "be solved without integrating knowledge from the natural sciences with that of social sciences and humanities." He clarifies that the humanities includes the creative arts.

More recently in a speech on arts and public policy, Yo-Yo Ma, who was a participant in Richard Saul Wurman's September 2012 WWW conference (see "[Esri Hosts WWW Conference—Reinventing the Art of Conservation](#)", *ArcNews* Winter 2012/2013), held on the Esri campus in Redlands, California, advocates adhering to the "edge effect." He says this is "where those of varied backgrounds come together in a zone of transition; a region of less structure, more diversity, and more possibility." This same notion of the edge effect, which is derived from the science of ecology, is what geodesign is all about—the synergy that is possible when science and design intersect. According to Albert Einstein, art and science have the same root: mystery. He also discusses the importance of curiosity, which is, of course, related to mystery. Focusing on commonalities will help scientists and designers forge a strong working relationship. Collaboration is a vital component of geodesign and will aid in the responsible transformation of places and provide movement toward more sustainable solutions for the land and communities.

Digital Literacy, or "Citizenville"

The world is becoming increasingly tied to and reliant on digital technology and easy access to information. In the five years from 2005 to 2010, the amount of global digital information (including documents, pictures, and

Tweets) grew nine times to nearly two zettabytes (IDC Report). The trend shows no signs of slowing, and online content will continue to become easier to share, tag, and find. Important information and data are no longer solely the domain of select scientists or government officials. Regular Jane and Joe Citizen are becoming more digitally literate every day. California's lieutenant governor, Gavin Newsom, examines this trend and its potential for an even more widely connected society in his recent book, *Citizenville*. He discusses the exciting opportunities that have emerged due to the availability of big data being brought down to the consumer level. He envisions how digital technology has the capability to enable people to take a greater role in governing and increase civic participation. For example, the City of Philadelphia has an open data initiative where half of all datasets are from the city's GIS.

To be sure, more is not necessarily better—there are many questions about the quality and authenticity of information. But that does not change the fact that people now expect to have information at their fingertips (literally). All this information needs to be filtered and then accompanied by a process to determine its wise use. Therefore, the geodesign process, which ferrets out which data is most relevant to a particular challenge and then helps bring it alive for people, is going to become essential for design and planning. In the GIS world, data collection and availability had been a problem, but now, more and more authenticated data is being made available daily as a service. The geodesign methodology provides an approach that, along with combining data and design, enables increasingly digitally literate citizens to become engaged in this important dialog about their place.

The Age of Innovation and Rapid Adaptation

Many believe we have left the Information Age behind—the proficiency and benefits of technological advancements are now expected and are certain to continue. It is becoming clear that the world we reside in now has moved into a new era, one that requires adaptability, inventiveness, and big-picture capabilities. In his book *A Whole New Mind*, Daniel Pink discusses these ideas and asserts that embracing creativity will provide a competitive advantage in this new era. He posits that both "high-concept" and "high-touch" approaches will rule:

"High concept involves the capacity to detect patterns and opportunities, to create artistic and emotional beauty, to craft a satisfying narrative, and to combine seemingly unrelated ideas into something new. High touch involves the ability to empathize with others, to understand the subtleties of human interaction, to find joy in one's self and to elicit it in others, and to stretch beyond the quotidian in pursuit of purpose and meaning."

It is as if Pink knew about geodesign when he wrote this, as nearly all of it fits neatly into the definitions and aspirations of geodesign. Detecting patterns—the growing capabilities of GIS provide that. Combining those patterns with creativity to realize something new—that is the essence of geodesign. The part about a narrative relates directly to his high-touch discussion of empathizing with people. Here again, if the geodesign process is conducted well, a community's values should inform design alternatives that will resonate with the people and satisfy the purpose. The best way to engage the people of the place is through a narrative that has meaning—one which they can embrace and will want to implement.

Today's complex and fast-moving environment requires constant readjustment by responding quickly and creatively to changes as they arise. GIS tools and apps are becoming more efficient and effective to enable rapid evaluation of design alternatives and can better predict the potential consequences of future decisions. These technological advancements, coupled with high-touch and high-concept approaches, illustrate how geodesign truly is a methodology well-suited to this new age of innovation and rapid adaptation.

Geodesign Defined for Education

What distinguishes geodesign from processes that deploy more innovative approaches to GIS? For example, GIS is commonly used to aid in making better decisions about siting and location. Is this geodesign? Possibly, but it depends on whether design thinking was part of the decision-making process, if stakeholders were engaged, and how the results of the process are evaluated. The term geodesign is new enough, and evolving fast enough, that it is important to define it for this context: education.

The January 2013 Geodesign Summit, hosted at Esri in Redlands, included two sessions dedicated to geodesign education: a preconference workshop and a panel discussion during the summit. During these forums, educator and practitioner participants agreed that geodesign involves new tools and approaches related to technology and data. There was also agreement that geodesign is cross-disciplinary, that it can be a bridge between professions—scientists don't know design, and designers are often not fluent in science—and that curriculum methodologies should be spatially oriented. These discussions are helping to shape an overview of the components that may be included in curricula for educational programs or degrees focused on geodesign.

Interestingly, participants at the education sessions did not have consensus regarding whether all students getting a geodesign degree need to learn design. Neither did they determine whether all geodesign students should learn GIS. This is perhaps indicative that as new geodesign programs and degrees emerge, there may be distinction between differing philosophies regarding the design and GIS components of geodesign. Nevertheless, it would seem valuable that students taking geodesign curricula should, at a minimum, get solid exposure to design thinking and design methodologies. Equally important then would be that students in geodesign programs should, at a minimum, also get solid exposure to GIS principles and basic processes.

A presummit survey generated some thought-provoking topics that merit future consideration in developing curricula, for example:

- How can a geodesign program capitalize on the activist interests of students?
- If the engagement of people is important in the geodesign process, should skills in participatory design be introduced?
- Should geodesign curricula incorporate complex economic development issues?
- Can data and the continuum of analysis be overemphasized, precipitating "analysis paralysis"?

It is anticipated that the fall 2013 Geodesign Summits in Europe and China will provide opportunities to further these curricular discussions from an even wider perspective.

A Bridge Between Professions

Regarding the above-noted concept that geodesign is cross-disciplinary and that it can be a bridge between professions, the academy is a great place to foster that bridge and instill a collaborative approach among all disciplines needed to address a geodesign challenge. This quote, adapted from the preface of Dr. Carl Steinitz's book *A Framework for Geodesign*, says this well:

"Each participant must know and be able to contribute something that the others cannot or do not. . . . Yet during the process, *no one need lose his or her professional, scientific or personal identity.*"

This may also stem from a related concept: people running a geodesign process can be considered "conductors," and conductors are not skilled at all instruments in the orchestra. Because of the complexity of the challenges geodesign addresses, no one person can have all the skills necessary to perform a geodesign process.

Clearly, at this early point in geodesign education's progression, it is important to realize that just as other fields have evolved to have unique variances in curricula based on faculty expertise, program location, and the like, so too it is likely that geodesign education will have variation by school, but one hopes that most programs will be rooted in a common core that includes the above points.

See also "[Geodesign Education Takes Flight.](#)"

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