GeoDesign is one of the newest buzzwords circulating around the GIS (Geographic Information System) community over the past few years. The first specialist meeting focused on spatial concepts in GIS and design was held at the University of California at Santa Barbara in December of 2008; since then, three other annual conferences, called the GeoDesign Summit, have taken place at Esri’s headquarter, the leading software development and services company in the GIS industry. People coming from academia, practicing communities and activists in design and planning, and geospatial technology industries are working together to give this newly emerging field a clear definition and develop it into a theoretically sound and practically proven design and planning framework.

Although attitudes towards GeoDesign may vary across disciplines, a strong consensus exists on the key issues explored by all GeoDesign enthusiasts. The central question may be posed as “to what extent are the fundamental spatial concepts that lie behind GIS relevant in design?” or “to what extent can the fundamental spatial concepts of design be addressed with GIS?”

GIS has been a driving force for promoting environmental understanding and decision making since it emerged in the 1970s. Design is a process for arranging physical elements in such a way as to best accomplish a particular purpose. GeoDesign merges both fields, bringing GIS into the process of designing human built environments. Carl Steinitz of Harvard University defines GeoDesign as “changing geography by design.” In this definition, the emphasis is on the active role of GeoDesign to shape our surroundings to our desired uses. The desire to change geography considers broader-scale plans beyond individual projects for a better understanding of the influence of and consequence for the native landscape.
According to Bill Miller, the director of GeoDesign Services at Esri, GeoDesign is "design in geographic space," the purpose of which is to "facilitate life in this geographic space." The essential aspect of his definition is the idea that the process of designing some aspect of the environment occurs within the context of geographic space, where the location of the entity being created is referenced to a larger geographic coordinate system. Because the design aspect is referenced to the geographic space in which it resides, means that it is also referenced to all other information related to that space, providing more information for the designer. This referential link between the entity being designed and its geographic context provides "the tangible basis for doing both science-based and evidence-based design."4 This is essentially the power of (doing) GeoDesign.

During his speech at the GeoDesign Summit in 2011, Thomas Fisher, Dean of the College of Design at the University of Minnesota, made an interesting connection between the transformative power of the concept of GeoDesign and the creation of
movable type, which dates back to 1452. Gutenberg’s groundbreaking invention and all the inexpensive printed books that came after it triggered a series of reformations and revolutions in western civilization over the next 500 years, including the Protestant Reformation in the 16th century, scientific revolution in the 17th century, the political revolutions in the 18th century, and the Industrial Revolution in the 19th century.6

Fisher went on to argue that, as a result of one invention and the Enlightenment that came from that, three things occurred:

1. **The partitioning of knowledge into disciplines.**
   We now have knowledge neatly packaged into departments and schools with their own language and literature.

2. **The separation of humans and nature.**
   The rise of scientific explorations that were so rational eventually led to the separation of us from the natural world, and the idea that we, as a species, had the right to own and exploit the planet.

3. **The abstraction of reality.**
   The profoundly rational way of seeing and thinking drove us to slice up our physical world into layers of semantic themes with measurable properties, boundaries, and all associated and controllable parameters.

These eventually all changed in the 20th century through two big discoveries. The first of which was ecology, through which we now see the world full of ecological and natural sub-systems that are vastly intertwined together in a web-like structure. The second of which was computing, in particular the Internet, which allows us to connect and mash up information via its enormous network. “We now live in a new reality, which is based on the web.” GeoDesign, a result of this 20th century intellectual revolution, marries these two ideas together. On one hand, it is a new application and a conceptual infrastructure which arises out of this new form of computing with all its powerful geospatial analytic capabilities. It allows us to connect dots in this vast web-like reality and discover any hidden patterns beneath its surface. On the other hand, it enables us to see through the landscape and understand the earth as a living system of geo-scape, which, according to Bill Miller, includes everything on, above, and below the surface of the earth that supports life.7

GeoDesign brings geospatial computing capacity into the process of design. It integrates geographic information science with design, resulting in a systematic methodology for spatial planning and decision making. It enables designers to think about geospatial data as a part of a creative decision-making process and to translate geographic analysis into built forms. This eventually results in designs that more closely follow natural systems. This benefits both people and nature, and provides a more synergistic coexistence.

There is a belief among some scholars and educators promoting GeoDesign in the academic community that there is a need to move beyond the GeoDesign catchphrase and establish a discipline of substance, including values, semantic clarity, and clearly defined processes that can be taught within the context of existing curricula offered by academic institutions. A number of prominent efforts have begun, including a proposed Bachelor of Science (BS) degree program in GeoDesign at University of Southern California; an online extension program in GeoDesign currently under development at Pennsylvania State University; and the BS degree program in geographic science and community planning at Northern Arizona University (NAU) adopted in spring 2011 and widely considered the first curriculum that is implemented under the GeoDesign framework. Through an interdisciplinary approach crossing the boundary between geography and planning, students in NAU’s program are expected to gain awareness of the earth and develop confidence to engage with places by learning the fundamental interrelationships between the earth’s physical and human systems. Students will communicate and apply approaches for maintaining sustainable environments, communities, and landscapes for the benefit of future generations.8

GeoDesign presents a tremendous opportunity for The University of Texas at Austin to truly transform its entire campus into a think tank for promoting and realizing sustainability. Toward this vision, UT Austin should:

1. **Generate a solid knowledge base for developing a comprehensive understanding of GeoDesign through interdisciplinary collaborations.**
   Break disciplinary boundaries and remap the university around challenges that are facing humanity, including environmental degradation, deforestation, desertification, pollution, and climate change.
2. Develop a design-centric geospatial technology with analysis, visualization, and communication capabilities.

Utilize all intellectual powers available in all academic units on campus to develop state-of-the-art digital frameworks and functionality that truly facilitate the GeoDesign process. Attention should be paid specifically to the following areas: pen-based user interface, scenario planning, real-time data generating through sensors, bottom-up mapping through crowdsourcing (collective intelligence), web GIS, mobile GIS, 3D and 4D (time-sensitive data) data visualization, soft data detecting through social networking (citizen sensors), distributed computing, seamless data exchange and sharing through wireless communication, and so on.

3. Explore new ways of implementing GeoDesign into a wide array of geospatial design inquiry and problem-solving situations.

Bring new knowledge and technologies into the ‘real world’ by taking a community-based approach to engaging with stakeholders to help instantiate GeoDesign as a credible way of design in the broader context of geographic space. The dissemination of this learning process through various applications will serve to enhance GeoDesign not only as an effective design framework that reconnects humans with nature, but also as another innovative invention that will transform our world into the next millennium.

GeoDesign has the power to bring disciplines together through a shared vision; through a combination of enabling technologies and innovative approaches, the full promise of GeoDesign can be realized. When digital geospatial data is combined and analyzed, design work will leverage information and create a shared model, leading to a whole new design and planning process. As an institution of higher education, it is up to UT Austin to help the world understand the ideas behind GeoDesign to enable and unleash its full potential for achieving sustainability.

References


