

On the Future of Digital Landscape Architecture

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Abstract: This essay speaks to the future of landscape architecture education and practice. Digital landscape architecture enables more varied and appropriate design methods for these challenges. It urges more collaborative engagement in design for larger, more serious global challenges.

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At the 21st annual Digital Landscape Architecture (DLA) 2020 conference I was asked to present a keynote ending-talk about the future of digital landscape architecture. The following is a personal and editorial selection from that presentation. It follows-on the keynote lecture that I presented in 2019, “(BEFORE) ANALOG TO a DIGITAL (FUTURE): a personal perspective”. The last image and text of the 2019 presentation follows.

The left photograph was taken by Charles Harris in the 1950s in Luzon in the Philippines. It represents the pre-analog, and this landscape has evolved over hundreds of years by local decisions and trial-and-error change. On the right is one of Joseph Claghorn’s algorithmic designs for informal housing in Medellin, Columbia (CLAGHORN 2018). The Medellin study represents one version of the digital future. Yet, these two images are very similar.

They follow very similar rules. And this is the real message of my (2019) presentation:



Charles Harris



Joseph Claghorn

“ The most important things are not the technologies or the methods, but rather the “Why” questions and the rules.”

Carl Steinitz, “(BEFORE)ANALOG TO a DIGITAL (FUTURE)”, DLA2019

Fig. 1: Old (analog) housing in the Philippines, proposed (digital) housing in Columbia

The most important things are not the methods or the technologies, but rather the “Why?” questions which initially define the context and objectives of design, and the rules which guide it. The “Why” questions reflect basic human needs, and the rules guide all of Nature’s systems, and this changes very slowly. The methods and technologies change over time, often rapidly. If we are to be part of significant designed change, we need to pay much more attention to the former.

The “Why” questions are the purposes of design (as a verb), and the rules shape the design (as a noun). The methods and the technologies are the enabling means.

If the above is true, then we need to ask:

- 1) What are the most important “Why?” questions?
- 2) From where and from whom will the rules come from?
- 3) What are the appropriate methods and technologies?
- 4) And how should these influence the future of education and practice in landscape architecture?

Consider some of the founders of the profession of landscape architecture: John Claudius Loudon, Peter Joseph Lenne, Frederick Law Olmsted, Patrick Geddes and Warren Manning. They had an important thing in common. They all designed private gardens for the leaders of society of their times, and they all designed very large proposals for the general population of their times. Loudon made a design for the entire region of London. Lenne designed the expansion of Berlin. Olmsted made a management plan for one of the largest private properties in the United States and this was the beginning of multiuse forestry in America. Geddes designed the plan for the expansion of Tel Aviv, and Manning made the first design for what was then the entire United States of America.

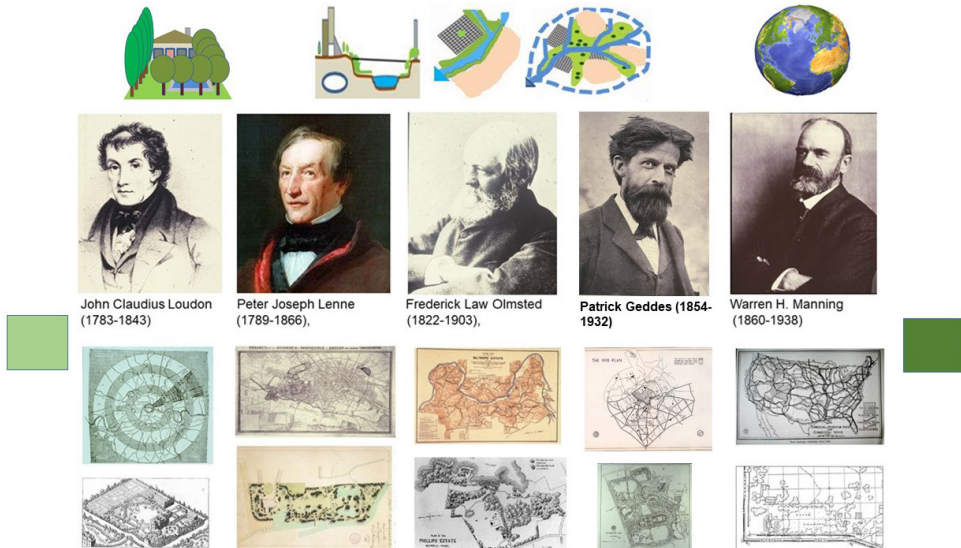
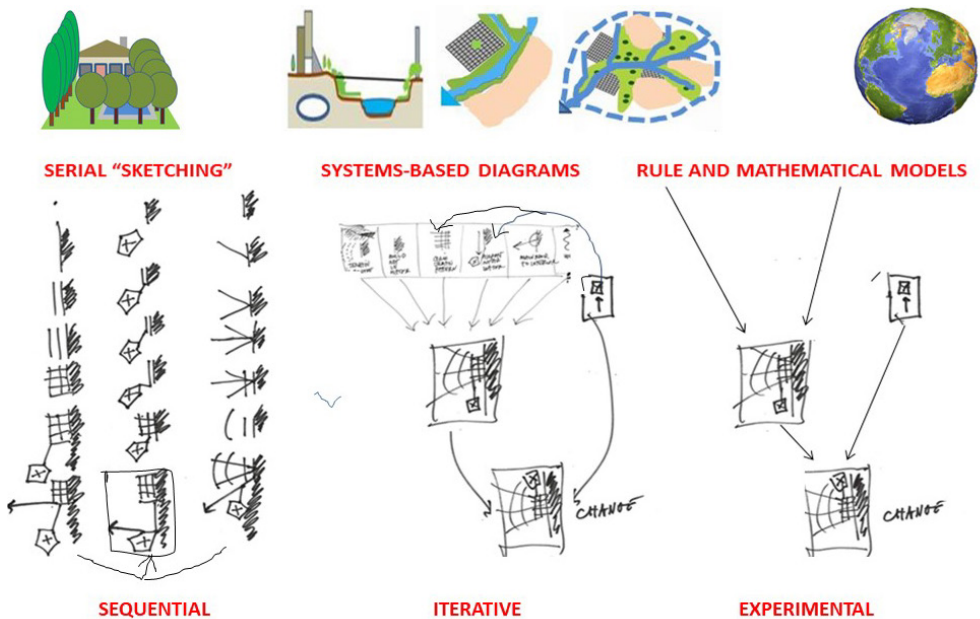


Fig. 2: Five founders of landscape architecture. The city plans in the upper row are Loudon, Berlin, the Biltmore estate, Jerusalem and USA.

These larger projects were accomplishments for which they were very proud and should be highly respected. With the exception of Manning, we don't really know how they made their designs but it is extremely likely that they did not design the same way at the garden scale and at the urban – regional scale. We can be sure that they were not digital.

Today, we are substantially digital and we would likely apply digital tools, certainly at the urban – regional scale and probably in some aspects at the garden scale.

In my opinion the real benefit of digital technology is the ability to broaden the design processes which are applicable to landscape architecture and to many other design professions. Too much of the technological innovation presented at DLA has been in support of design processes, either in their technical organization related to data or in their presentation and visualization. But they apply digital technical innovation in design methods which have been the core of pre-digital professional activity. We are still sketching serially in the digital world rather than applying iterative diagrammatic methods or rule-based experimental methods, and these are far more appropriate as projects and studies get larger in size, more long-term and necessarily uncertain. When you are trying to build a smaller project and need precise working drawings, designing individually it is not the same as when you are collaboratively designing a long-term landscape and development strategy in which the outcome “will be something like this”.



<http://video.esri.com/watch/4162/experiments-in-geodesign-synthesis>

2014 Steinitz, C "Which Way of Designing?", in Lee, Danbi, Dias, Eduardo, Scholten Henk, (Eds.), Geodesign by Integrating Design and Geospatial Sciences, Springer, pp 11 - 43

Fig. 3: Different ways of designing

The overarching theme of the DLA 2020 conference was the relationship between (digital) landscape architecture and climate change. I think that this is the single most important “Why?” question and that it will be the pervasive theme facing our academic and professional activity in the coming generations.

The two most relevant, interesting, and significant readings which I have encountered in the last months, when combined, present a sharp perspective on what I consider single most important “Why?” response. The human climate niche is an index which combines comfort for living and agricultural productivity at lower energy cost (XU et al. 2020). The figure below shows the suitability of the human climate niche in 2020 and a forecast for 2070, and it asks what the influence of change this might be on the global redistribution of population.

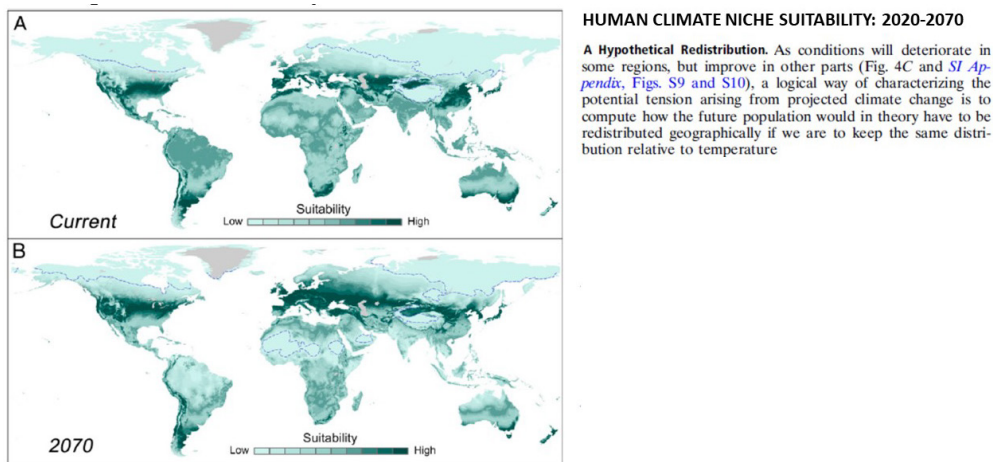


Fig. 4: The human climate niche, 2020 and 2070 (XU et al. 2020)

The figure below shows the difference in human climate niche suitability and it forecasts that people will therefore leave the areas in darkest red. What is striking is the number of people projected to migrate to more suitable human climate niches, basically migrating to the north and south. In a business-as-usual climate scenario and accounting for expected demographic developments, approximately 3.5 billion people, roughly 30% of projected global population, would move. Even with strong climate mitigation policies and projects approximately 1.5 billion people, around 13% of projected global population, would migrate. This will have the most profound impacts on absolutely everything in the world and everything that we do as professionals. If even a substantial portion of this projection occurred, it would generate enormous change on the environment and society.

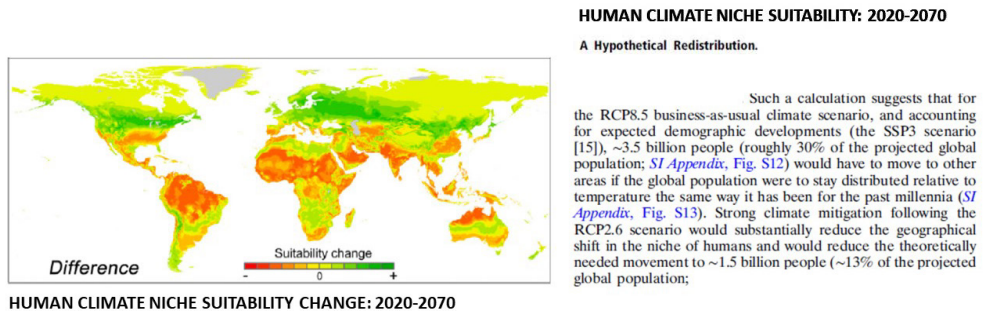


Fig. 5: Human climate niche suitability change: 2020 – 2070 (XU et al. 2020)

The second study is an assessment of forest landscape restoration opportunities which spatially indicates a significant opportunity to help fight climate change and to restore biodiversity (World Resources Institute 2020). The figure below shows existing human pressure globally, in an index defined by land-use intensity mainly caused by agriculture and population density.

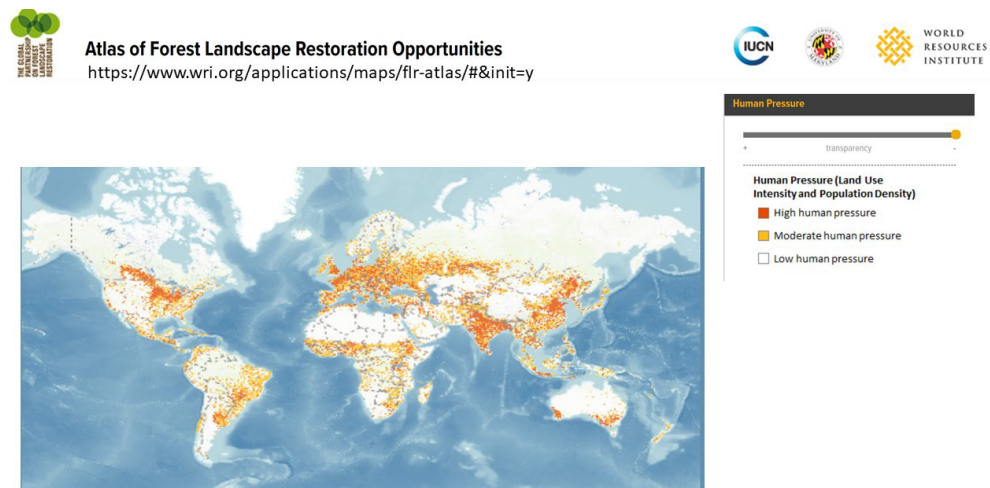


Fig. 6: Human pressure (land-use intensity and population density) (WRI 2014)

The global potential extent of forests is shown in the next figure and these are being lost to urbanization, industry and agriculture at an alarming rate. These forests need immediate enforced protection.



Fig. 7: Potential extent of forests and woodlands (WRI 2014)

The opportunities for several kinds of restoration are shown in the following figure. The World Economic Forum (WEF 2020) has launched a global initiative to grow, restore and conserve 1 trillion trees around the world by 2030.

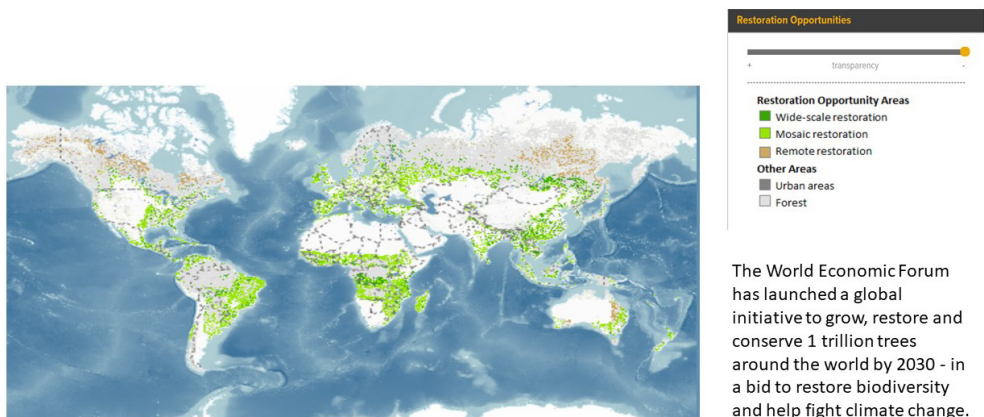


Fig. 8: Forest landscape restoration opportunity areas (WRI 2014)

Taken together, the implications of these two studies indicate a profoundly threatening set of projected changes to the environment and society and also an aspect of potential mitigation that we as landscape architects cannot ignore to consider in our teaching and practice. They require responses which range from the very local to the global in size and scale. The International Geodesign Collaboration may be part of such a mitigating strategy.

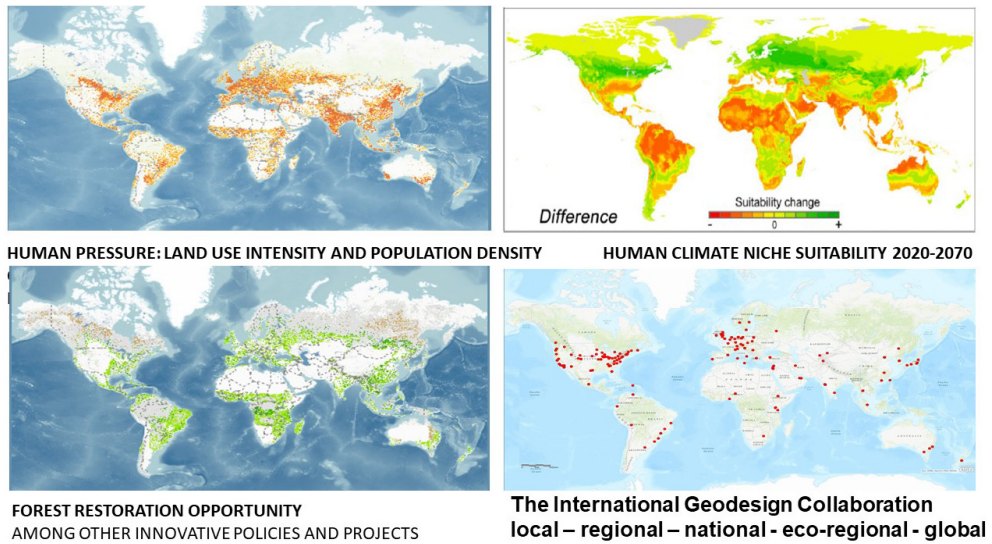


Fig. 9: What are the relationships among the prior figures? The International Geodesign Collaboration

In 2018, at the instigation of Carl Steinitz, Brian Orland and Tom Fisher, ninety global university teams agreed to collaborate to create scenario-driven designs for local-to-regional scale study areas to address future changes <https://www.igc-geodesign.org/igc-overview>. There are now 150-member university teams, in 50 countries, in the IGC.

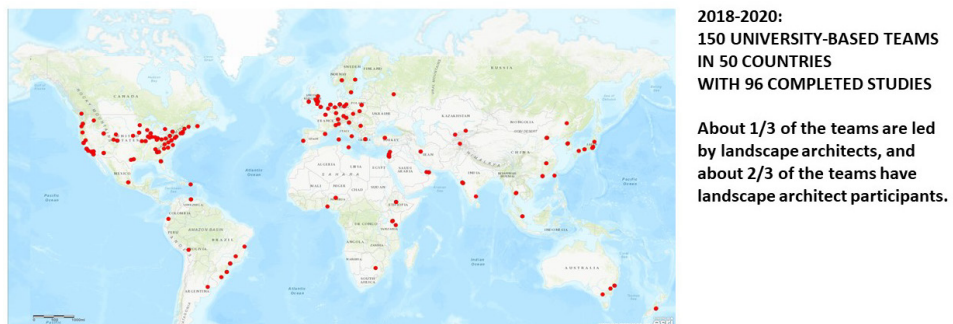


Fig. 10: Membership in the International Geodesign Collaboration (2020)

The IGC strategy requires adherence to common scenario and time frames, nomenclatures and processes, and which

- Follow a consistent and transparent workflow.
- Address global change assumptions based on international governmental and NGO projections.
- Adopt standard resource systems as the basis for design (e. g. water, green infrastructure, transportation, energy infrastructure, housing etc.) and innovative adaptations to those systems. Apply these on square study areas.

- d) Examine scenarios for early-, late-, and non-adopters of design innovations, and assess the impacts by the UN Sustainability Development Goals (SDGs) at three time-steps, 2020 (existing), 2035, and 2050.

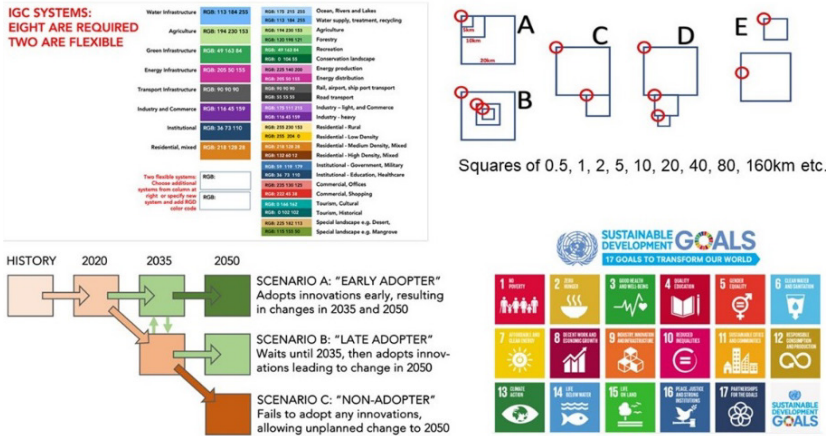


Fig. 11: Agreed conventions in the International Geodesign Collaboration

In 2020 the International Geodesign Collaboration published the book based on the 50 projects which were completed in 2019 (FISHER, ORLAND & STEINITZ 2020). These are also available in poster format on the IGC website, along with the projects completed in 2020.

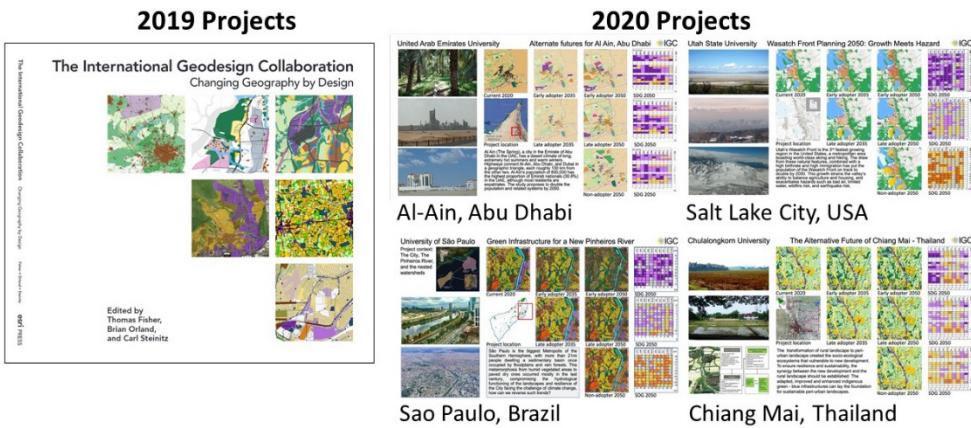
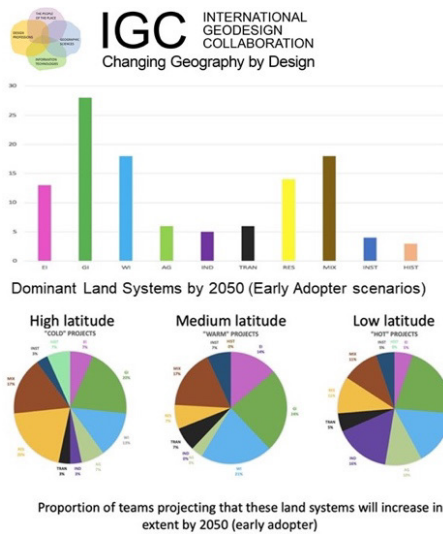


Fig. 12: The publication of the first 50 IGC projects

The 2019 projects were comparatively assessed and two of the conclusions are especially important. First, there was considerable variation in the significance of the systems included in the studies. Green Infrastructure, water infrastructure and mixed higher density housing with commerce and institutions were dominant... and these are core interests of landscape architecture. Second, the systems were considered differently as functions of climate, macro-geography and level of economic development.



<http://www.igc-geodesign.org>



- There was variance in the roles of the required nine systems across all projects.
- There was variance in systems inclusion by latitude-related climate.
- There was variance in systems inclusion by macro-geography and general level of economic development.

Fig. 13: Comparing the first 50 IGC projects

The implication is clear: One global design or one global set of policies and projects is not the answer to the mitigation of climate change. There must be local geodesign adaptations to systems-based policies and projects which can cumulate by negotiation into a global geodesign strategy. I think that the founders of the profession, if living today, would be important participants in the International Geodesign Collaboration and working with us in these local-to-global studies. They would likely focus on the larger studies and their work would be collaborative and fully digital.

I think that there are four reasonably clear possibilities for the future of digital landscape architecture, within a profession and an academic field only some of which is digital (and appropriately so).

The first possibility is simply a continuation of where I think we are today, in which most landscape architecture faculty, students and professionals are oriented towards immediate client-oriented projects, and working non-digittally much as the founders did.

The second possibility follows the first and assumes increasing competition for what has become “hot property”—the landscape. External competition at all scales will likely produce a narrower landscape architecture profession, far different from that imagined over 100 years ago by the founders of the profession of landscape architecture.

The third possibility is that the wrongheaded and artificial division between “planning” and “designing” (as verbs) will be continued and even reinforced, and that landscape architecture will itself choose to focus on the design of smaller projects. It will result mainly from two factors — the unfortunate caricature of landscape architecture as gardening, and the landscape architecture profession’s own accredited priorities towards private project practice.

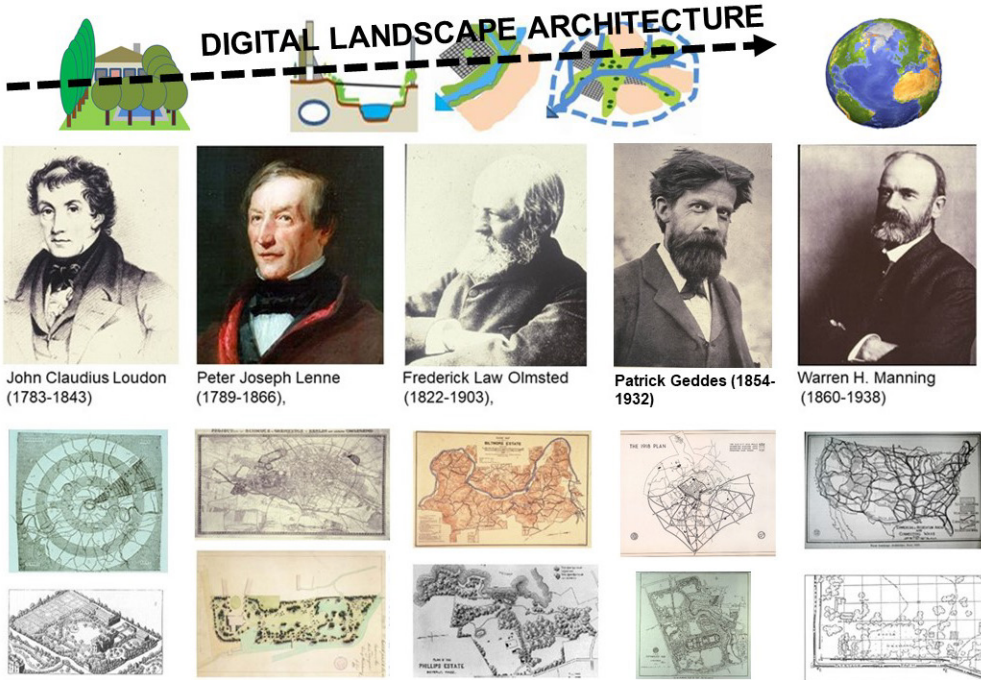


Fig. 14: Would the founders adopt digital landscape architecture? Would they participate in the International Geodesign Collaboration?

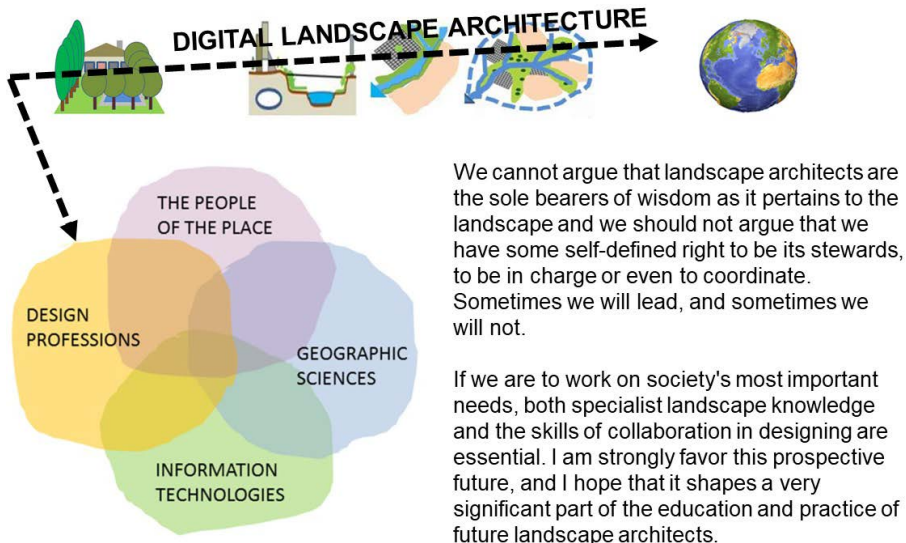


Fig. 15: A view toward the future of digital landscape architecture

The fourth possibility relies on recognizing the wisdom of the founders of the profession. First, we must know and do something that other professions do not. In our case this must be rooted in the landscape itself and at all sizes and scales: climate, geology, hydrology, ecology, perception etc... and all can be considered when designing with digital support. The digital technologies are the means... they are not the ends. Second, we must understand that almost everything we do to change the landscape requires collaboration in designing, whether with architects at the smaller size, urban designers and planners at the middle sizes, geographers at the larger sizes, with engineers at all scales, and with lawyers and bankers and government officials, and especially with many diverse stakeholders... yet with no one losing his/her personal or professional identity. This was the dominant vision at Harvard when I joined the Harvard faculty in 1965 and it is a perspective which I hold to this day.

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