

# GeoDesign Education: Where We Are and Where We Are Going

Thomas Fisher of the University of Minnesota provides an overview of geodesign educational programs and moderates a panel of educators who discuss the challenges and opportunities they face in integrating geodesign into their curriculums.

<http://video.esri.com/watch/1009/geodesign-education-where-we-are-and-where-we-are-going>

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## Video Transcription

**00:01** We want to tell you about where education is and where it's going, and before I introduce our speakers, I just want to say...

**00:06** ...a few words about where this is going in a kind of more general sense.

**00:12** Bill Miller's working paper, which I highly recommend, talks about geodesign being no big deal.

**00:16** Well, I want to make the argument it is a very big deal, and Jack said today that ArcGIS Online is a new medium.

**00:23** I totally agree. And I think, borrowing from McLuhan, the medium here is the message.

**00:29** We all have been using GIS. It's a very powerful tool. Like many good tools though, it has largely enabled us to do what...

**00:37** ...we already know how to do better, faster, and cheaper.

**00:40** I want to make the argument that geodesign is a change in kind, and not just degree, from GIS.

**00:47** That it is a fundamentally new way of thinking about this that I think you'll see from our presenters as having revolutionary...

**00:54** ...implications for education. Why is that? I think because education, like the physical environment itself, has been...

**01:03** ...developed in, to use Paul's term, disjointed incrementalism. That we have essentially fragmented habitat, exploited...

**01:12** ...resources, divided communities, because of the way in which we see the world, and the way in which we think about it.

**01:20** And so, I want to make the case in three, four minutes, that geodesign is a radically synthetic tool, synthesizing tool...

**01:28** ...and that it will change the way we do design, the way we think about science, and the way we educate.

**01:35** So let me just give you a few examples of what I mean by that. GIS science in general is very good at conveying information.

**01:43** Education is very good at having big lecture halls and having faculty convey information. Not very good at conveying values.

**01:51** Design, on the other hand, is a very value-laden activity, but has not been very data rich. Has not been very informed.

**01:59** What geodesign does is it brings the fact/value divide that has existed since David Hume and has certainly...

**02:07** ...been an underpinning of a lot of the modern universities. It brings those two together in a very powerful way.

**02:15** As we heard from Carl, science works from this sort of planetary scale down. Design works from the site scale up.

**02:23** Geodesign is, I think, a tool that will enable us to work at both scales simultaneously. Very powerful.

**02:30** So the idea ultimately I think, is so that we can make site decisions and know planetary impacts.

**02:36** I think that's where we're going, and that will be profound.

**02:41** Science is very good, and humanities are really good, at telling us what was, and what is. Design talks about what could be.

**02:48** Those things have been kept very separate in universities. Geodesign brings them together.

**02:53** This is just also changing our ethics. Science has very good, at helping us understand consequences.

**03:00** Design is very much a discipline focused on having good intentions.

**03:05** Has generally been pretty poor in understanding the consequences of design decision.

**03:10** Geodesign enables those two ethical positions. Focused on intentions and focused on consequences brings them together.

**03:18** It's also changing our roles as professionals. We have basically been educating specialists in fields for at least most of this century.

**03:30** Designers are the last generalist profession. And geodesign enables us, to use Carl's terms, to not only have soloists...

**03:39** ...but to have conductors, and to have them working together in an orchestrated way.

**03:44** And then finally, to build on something that Bill Miller talks about in his working paper, it is changing the way we reason.

**03:52** That science is inductive. Design is abductive and geodesign is a going back and forth between induction and abduction.

**04:02** Moving laterally, as well as deep. And this is changing the way in which we will be educating.

**04:09** Universities have been, of course, also spatially distributed in ways to keep all of these disciplines separate, as we all know...

**04:18** ...and has fragmented knowledge. And I think one of the reasons why geodesign is having, and will have...

**04:25** ...and continue to have such a powerful impact on education, is that universities are completely unsustainable...

**04:30** ...and they are getting to the point where they're unaffordable and they cannot keep going the way they are going.

**04:36** So universities themselves have become a geodesign problem, and a geodesign opportunity.

**04:42** And I think some of what we'll hear today is really to make that point. So, I just wanted to give you a very...

**04:48** ...one slide here. Last year, I talked in my Lightning Talk about this spatial infrastructure we were setting up at...

**04:55** ...the University of Minnesota, and also the notion of the challenge-based curriculum.

**04:59** I just wanted to report back to show you the profound effect that geodesign is having.

**05:03** One of the things we're finding is geodesign is becoming pervasive.

**05:07** It's being used, not only in the geography department, and in the department of landscape architecture, it's being used in...

**05:12** ...our education college to teach creativity to kids in K-12 education. It's being used in agriculture to redesign the food system.

**05:20** It's being used in our government school to redesign government. And so, geodesign is becoming pervasive...

**05:26** ...and it's incredible how many things we're discovering almost every day.

**05:31** The other thing is that it is leading and driving this challenge-oriented way of thinking about universities.

**05:38** We've discovered that applied economics is using it to basically ask the question, How will...

**05:46** ...nine billion people fit on the planet? And so, these are economists using geodesign.

**05:53** We have an institute in the environment that has a Natural Capital project...

**05:57** ...which is looking at how we can continue to develop using the natural capital of the planet. And so, this notion of education...

**06:05** ...moving toward a kind of key-shape orientation where students would major in a discipline and minor in a challenge...

**06:13** ...is I think, one of the ways in which geodesign is going to sort of force and encourage a restructuring of education, and...

**06:22** ... we're starting to see that now. And then, a couple final points.

**06:27** I think another thing that is going to happen as a result of this is, as we're seeing with ArcGIS Online, as we're...

**06:35** ...seeing with some of the online degree programs that are arising in places like Penn State, and USC, is it will...

**06:42** ...increasingly drive a kind of virtuality to education. I think we'll challenge universities to say, Why come to a campus?

**06:50** I think it's going to also encourage a lot of collaboration. Cartels is another term that Carl's used among universities around...

**07:00** ...challenges. And so, I think that actually the kind of gathering we have here is an example of the way in which...

**07:07** ...education will increasingly be structured, where there will be many disciplines from many institutions...

**07:13** ...gathering around important questions.

**07:16** And then finally, I think that one of the things we're seeing as we look at what's happening in these other...

**07:21** ...disciplines, is they're also starting to be quite interested in the studio model of education, is they're recognizing that...

**07:28** ...studio is, has always been, this kind of marginalized activity at universities, is this immersive, conversationally based...

**07:38** ...oriented, storytelling oriented game-like way of learning and teaching, and I think we will see that being pervasive.

**07:48** And that is really why I wanted the group of speakers today to tell you about what they're doing largely in...

**07:54** ...studio and applying geodesign. And as you will see, it's theoretical and applied. It's both about facts and values.

**08:02** It's about both what is, and what could be. And I think we're about to have a treat to see some of the best work going on...

**08:08** ...anywhere in the country among our speakers. So let me introduce our first speaker, Karen Hanna, who many of you...

**08:15** ...know is former dean at Cal Poly Pomona, and is now in the department of landscape architecture.

**08:20** She's a landscape architect. A well known author of two books, GIS in Site Design and...

**08:26** ...GIS in Landscape Architecture, so Karen.

**08:29** Thank you. Ah, okay, technology works. Okay, I'm going to talk today about this project, which is a 606...

**08:38** ...project. And our 606 studio takes the third year of our graduate program.

**08:44** And for 30 years we've been doing these projects. John Lyle started these projects. And for the last 15 years...

**08:52** ...we've been using GIS in them, and the GIS and geospatial technologies are getting more and more complex.

**08:59** I have to recognize the student team that did this project, Jake, Megan, Eric and Sina.

**09:07** This project is an LID project, a low impact development project. And it takes place in San Antonio, Texas.

**09:17** The...it's sponsored by the Lady Bird Johnson Wildflower Center, and the San Antonio River Authority.

**09:26** And the purpose of this project is not just to look at LID principles, but to serve as a baseline that could become...

**09:36** ...a guidebook for a statewide manual on LID. So everybody knows that LID is mostly about storm water management...

**09:46** ...and there're two big parts of LID. One is design, and Doug Olsen talked quite a bit about this yesterday.

**09:55** And the other half is the BMPs, the best management practices, and there have been numerous references to...

**10:04** ...BMPs in the last several presentations. So these are the principles, and I won't read through them.

**10:14** One of the things that we require in 606 is that the students must work at the regional scale, the local scale, and the site scale.

**10:22** So they have to do analysis at all three scales. And so, that it's become, we believe it's become geodesign...

**10:31** ...because it's at all three scales.

**10:35** So here is the San Antonio River watershed, right there. And this part of Texas is called flash flood alley because of the...

**10:48** ...weather patterns cause lots and lots of flooding.

**10:52** And so, LID is an issue that's very important for most of Texas.

**10:59** This section through the watershed shows, you know, the upper watershed, the prairie, and the plains.

**11:10** The plains area is where the city of San Antonio is. And during this project we were very fortunate because we were...

**11:19** ...able to use a hydrology expert from the University of Texas at Austin, which is very close by.

**11:27** Somebody who's very familiar with the flood actions that take place in this area. And so, very traditional GIS analysis...

**11:39** ...looking at different soil types, impervious area, the areas that have been built on.

**11:48** And then they came up with a complete nine factors. Now I agree with Carl, you don't have to collect all the data in...

**11:57** ...the world, you need to determine what the issues are and determine how much data you need to answer those questions.

**12:06** They were fortunate because they were able to go there and have two rounds of public meetings and meetings with...

**12:12** ...all their stakeholders. And so they found out what the values were of the local population.

**12:20** So, you know, they included aquifer recharge areas, riparian areas, population density, and so forth.

**12:27** And then, you know, pretty straightforward analysis map. And from that, they selected four areas where they...

**12:37** ...could do different types of site designs that demonstrated LID principles.

**12:44** And so, this is high in the watershed, a greenfield site with a retention basin and coverage, woodland coverage.

**12:56** Traditional design, 220 homes. An LID design, 230 apartments plus 90 homes. They did not look at the market...

**13:07** ...comparability of these, but they were able to preserve a lot of this canopy, which slows down the water, put in...

**13:18** ...a new stream, preserve these retention ponds, and add recreational facilities.

**13:26** And then, of course, show some graphics of what that would look like. And then downtown, of course, they had...

**13:33** ...a much denser area. This is an example of an existing residential area where there wasn't much opportunity to do LID...

**13:44** ...design and apply those principles, but they could put BMPs. And so, I'll show you just a couple of little examples of BMPs.

**13:55** Here's an existing residential site where they've put a rain garden in the front and a cistern in the back.

**14:01** And so here, whoops, there's the section and here's the proposed section. This was a vacant lot that they turned...

**14:11** ...into a park because their public meeting said that they needed more recreation in this area.

**14:17** And so, a little park with a biofiltration area, a recreation area, and a parking area.

**14:24** And that's the section, and there's a visual simulation of it. And then, as in all of our projects, we require them...

**14:33** ...to extrapolate what they've discovered, and then figure out what the net gain would be. So here's the predevelopment runoff.

**14:45** Here's the existing situation, and this is after they've installed these LID principles in each area.

**14:54** Thank you very much.

**15:00** Our next speaker is Jim Querry, who's the GIS director for the city of Philadelphia and an adjunct faculty member in...

**15:05** ...landscape architecture at Philadelphia University.

**15:08** He's registered, and has 25 years of experience applying GIS in design situations. So, Jim.

**15:18** Thank you. So I'm here representing Philadelphia University, a small university in Philadelphia.

**15:26** An enrollment of about 4,000. And quick disclosure. I'm a part-timer there, representing the university.

**15:33** And the university is developing a geodesign program, a geodesign master's program.

**15:42** We expect it to be kicking off about a year from now. We're not sure if it's going to be an MSLA, geodesign, or master...

**15:50** ...of science in geodesign. We're figuring that out with the help of an advisory board.

**15:57** Let me jump right into the projects here. We...so Philadelphia University has an architecture program, landscape...

**16:06** ...architecture program. We have a master's degree in sustainable design, construction management, interior and...

**16:16** ...visualization, interior design and visualization. So all of that is in the College of Architecture in the built environment.

**16:22** The university is very innovative. They pride themselves on project-based programs.

**16:29** Project-based coursework and collaboration among departments, so transdisciplinary, interdisciplinary collaboration.

**16:39** And they're very tied into the community, obviously. So we draw heavily from Philadelphia in the region for...

**16:46** ...faculty, part-time faculty who are practitioners, as well as projects and clients.

**16:54** We try to keep our projects client-based, so even in the intro class...so I've been teaching for seven years, an...

**17:02** ...intro course, an advanced course. This is an example of something we did a few years ago in determining...

**17:08** ...a suitable location for a cell phone lot at Philadelphia International Airport.

**17:12** So we would take the students out, we'd do a site assessment, meet with the airport, understand their program...

**17:17** ...requirements and then start to get into...and I'm not saying this is geodesign, I'm saying this is our foray into geodesign.

**17:26** So this is how we're using GIS in design, in Philadelphia University. So, let's see if I have this correct.

**17:34** Ah, okay. So one of the things we're trying to do is help students visualize the impact of what they're doing in two dimension now.

**17:42** They're used to working in two dimensions. We're wanting them to be able to extend that and see what the results of their...

**17:53** ...designs and what they're proposing. See the results of, and the impact of their design.

**18:00** So this is, as I said, an early example. This is something we just finished this semester.

**18:07** This was the advanced class, and a group of students right here, there are five of them, this...the idea of this was to find suitable...

**18:19** ...sites for green roofs in the densest part of Philadelphia that is in the combined sewer overflow areas.

**18:27** So, two-thirds of the city has combined storm and sanitary systems. So that means we're treating storm water and...

**18:35** ...we don't want to treat storm water if we don't have to.

**18:37** So we want to find where in those densest areas we can target to build these green roofs.

**18:46** So at the core of this was, I mean it was, it was a pretty standard process we went through.

**18:51** And at the core of it was the model. The students developed the model. They developed a tool.

**18:58** Something we're envisioning in the geodesign program is that they're not only going to, as part of that program...

**19:05** ...experience this kind of a process, but they're going to experience developing these tools and then sharing...

**19:12** ...these tools out with their colleagues, or contemporaries. So this was, just a quick example of how we're...

**19:22** ...again, how we're using GIS now. As far as the proposed geodesign program, we're at a

point where it is about to be submitted...

**19:32** ...to the state for approval. Our target audience are recent graduates, undergraduate graduates in the allied professions.

**19:42** So landscape architecture, architecture, planning, urban planning. The other...the thing that we're trying to...

**19:53** ...emphasize is, in this, is that we want this to be a service-based learning experience for the students.

**20:01** We want them to have real projects, real clients, and we also want it to be interdisciplinary.

**20:07** So we're involving architecture. We're involving interiors. We're involving sustainable design in the core curriculum...

**20:16** ...and then we're having...right now, it's envisioned that we will have two immersive studios.

**20:23** And at the end of it, we're proposing that the program also incorporate a lot of innovative technology. So 3D automated...

**20:41** ...content generation, data collection using lidar from various forms, whether it's spatial robotics, aerial, or mobile...

**20:51** ...mapping, and that's pretty much it. We're...the program, as I said, is we're proposing to kick off about a year...

**21:00** ...from now, assuming everything goes as planned, and we're looking forward to it.

**21:08** Thanks, Jim.

**21:09** Thank you.

**21:12** Our next speaker is Janet Silbernagel, from University of Wisconsin Madison, landscape architect, works on...

**21:20** ...regional conservation strategy, so Janet.

**21:23** Great. Thank you. So I'm going to talk about a course in our bachelor's of science and landscape architecture...

**21:32** ...program regional design course. One that I've been involved with for a number of years, which I love, and am...

**21:40** ...also can be very frustrated by, and I'll tell you why. I have a couple of key goals for regional design.

**21:49** This comes from some of the learning objectives. Two main words that I try to bring to this regional design studio...

**22:00** ...are synthesis and spatial form, and I'll add to that, strategies, too.

**22:06** But, so this is an upper-level landscape architecture studio. They're culminating, they're about to culminate their degree.

**22:15** So I expect, we expect them to come into this studio and be able to synthesize all the realms of knowledge that they've...

**22:24** ...gained over their coursework over the...and design studios over the past several years.

**22:30** At this point they ought to be able to do that well.

**22:33** Secondly, spatial form is an obvious point here, but in terms of distinguishing regional design from a more policy-oriented...

**22:42** ...regional planning, I talk to the students about that this is a form giving, it's spatially oriented.

**22:50** That you learn to read, interpret, and imagine patterns for the landscape. We come from the heritage of Phil Lewis, who...

**23:01** ...envisioned patterns, big patterns across big landscapes and regions. And he did that in very visual and textural ways.

**23:10** And so we want to carry that on. Regional design is really form giving.

**23:18** And then third is the strategies.

**23:20** It's about developing, thinking strategically about the places to build, conserve, protect, et cetera, on a regional scale.

**23:30** So, back to Chengdu. An example from the studio project in 2008, I had been able to, I was coincidentally in Chengdu...

**23:43** ...the September after the Sichuan earthquake, and knowing that I was coming back to teach the regional design course.

**23:51** So I was fortunate to have some Chinese colleagues who I was with in Chengdu, who were willing to take me up into...

**23:59** ...the earthquake-affected region, and then share some of the data that, mapping data that they'd been working...

**24:05** ...on that I could bring back to the class.

**24:08** And even more fortunate that I had a teaching assistant from China who could help translate data as it came back and forth.

**24:17** So an example just of one of the outputs from the course. Of course, panda habitat is an important part of...

**24:28** ...Chengdu is here, this is a...it's at the base of the Tibetan plateau, so this is the plains, these are the mountains...

**24:37** ...Wolong Nature Preserve and much of this landscape is habitat for the giant panda.

**24:44** So that's an important criteria, but also rebuilding urban centers and infrastructure.

**24:50** This one, this example of student work is just interesting to me in that they were beginning to

think about scenarios...

**24:59** ...with different strategic goals that aren't scale dependent as these suggest, but more about a short-term focus...

**25:08** ...versus a real regional long-term focus. And trying to accommodate both the conservation and infrastructural needs.

**25:18** So we had work that these Chinese colleagues had done on mapping giant panda habitat and the habitat that was lost...

**25:26** ...and they made use of those. They did, you know, another student group product here.

**25:35** They did the combined weighted overlays of infrastructure and environment. And each of those had their various layers of...

**25:45** ...environmental and infrastructure layers, so the suitable panda habitat.

**25:53** And so, combining those and coming up, again, with strategic form-giving solutions is what we're trying to get at.

**26:01** So, more recently, now in this past fall, I'm no longer teaching the course, so a couple of instructors, Doug Hadley...

**26:10** ...and James Steiner are taking a slightly different twist. They're working more with an urban regions focus and...

**26:17** ...applying the book by Richard Forman on urban regions and, but again, pushing students to look at a city...

**26:28** ...of their choice, and think about all the patterns and the layers of information that goes into understanding what...

**26:39** ...gives a particular region its unique characteristics.

**26:43** And so this is just one page of one regional analysis for Savannah, Georgia, and how...so skipping over about five pages...

**26:53** ...of more analysis, but how they arrive in some strategic solutions for that particular region.

**27:02** Now I forgot to mention, that what makes this frustrating is students are so reluctant to do this.

**27:10** To put...I encourage them to do really broad spatial sketching, you know, to sketch out ideas and, and spatial...

**27:21** ...strategies and they're very timid about doing that. And I think, one is it's just scary to work at that scale when you...

**27:29** ...haven't before, but second, they don't think that this will be helpful for their portfolio.

**27:35** So, of course, I know that it will be, but it's hard to convince them of that. So this is one of our biggest challenges.

**27:44** Here's another example from this past year for Salt Lake. So again, layers of information that synthesizing is coming together.

**27:55** The strategizing is coming together. What we are not getting to, in terms of geodesign, is the evaluation.

**28:05** I think they're getting to a design endpoint, like a designer looking for the evaluation as a critique from the...

**28:13** ...professor and then something that they can put in the portfolio. So that's our sticking point right now.

**28:21** Thank you, Janet.

**28:25** Our next speaker is David Pitt, a professor in department of landscape architecture at the University of Minnesota...

**28:31** ...coeditor of Landscape Journal. He's developed a GIS-based landscape assessment process for local governments, so, David.

**28:39** Thank you, John. I want to talk rather than about specific projects, I want to talk about a conceptual way of thinking...

**28:48** ...about geodesign that several of us at the University of Minnesota and elsewhere, Michigan State and University...

**28:55** ...of British Columbia, are using. And the only thing I want to talk about with this slide is, is that among the three...

**29:02** ...universities in two countries, they're, in addition to landscape architecture, urban planning, agroecology...

**29:08** ...hydrology, geography, ecological modeling, and social psychology.

**29:12** So we really are trying to integrate multiple ways of knowing and multiple understandings of landscape process.

**29:23** The major components of the process with which we are working essentially are three.

**29:29** First is the notion of spatial information. Multiple information sets pertaining to a design scenario development and evaluation...

**29:39** ...focusing on participant perspectives, but also on landscape pattern and process, and particularly on performance of...

**29:46** ...landscape. Both landscape prior to whatever intervention happens, as well as a landscape that happens after intervention.

**29:55** Secondly is the notion of communicating this information. Communication of scenario information among participants.

**30:02** And thirdly is use of iterative and transdisciplinary action processes among multiple stakeholders in terms of...

**30:10** ...how they actually use this information. And then there are several feedback loops that we're working with, that wind up...

**30:19** ...producing sort of a cyclical process of information, communication, and decision-making process in the social...

**30:30** ...construction and evaluation of design outcomes.

**30:34** From a standpoint of transdisciplinary action processes, the way I like to define transdisciplinary is Dan Stokols'...

**30:41** ...perspective that basically talks about the interaction of multiple disciplines, the interaction of experts and...

**30:49** ...lay audiences with a common commitment to the construction and evaluation of new information, and...

**30:56** ...in this case, alternative future visions.

**30:59** That process is facilitated toward tolerance and integration and multiple world views.

**31:06** A consensus-based approach for handling the conflicts between those world views leads to a sense of social learning, shared...

**31:15** ...understandings, which then produces a collaborative decision-making processes toward design outcomes.

**31:23** Multiple information sets that we're talking about have to do with a stakeholder experiential perspectives with a...

**31:31** ...systemic integrative and spatial temporal understandings of landscape performance having to do with such...

**31:36** ...things as water quality, biodiversity, auto emissions, affordable housing. Of course, we use the A word there.

**31:46** And then, as I said earlier, a series of feedback loops that allow the initial design outcome to be evaluated, to be cycled back...

**31:57** ...through communication representation and back into a design process.

**32:05** And then this information being communicated in terms that are salient, credible, legitimate and...

**32:13** ...understandable to the stakeholders, and are communicated through multiple modes of representation and visualization...

**32:21** ...that have been far better illustrated than I can talk about today.

**32:25** So the overall model of this notion of social construction of policy for integrative landscape planning involves...

**32:33** ...spatial modeling of integrative and systemic understandings, visualization and representation of that information...

**32:40** ...pertaining to landscape performance and experience and then the construction of and evaluation through...

**32:48** ...communicative action and social learning among multiple stakeholder groups of design strategies which then are...

**32:57** ...fed back into spatial modeling, fed back through the communication and process. And so, it's kind of an iterative process.

**33:08** The...why transdisciplinary geodesign? Number of reasons. The landscape metrics derived from comprehensive...

**33:17** ...the information leads to adaptively develop performance-based scenarios.

**33:24** The communication process leads to more stable decisions that are more likely to be owned.

**33:31** Results in better informed design decision making that is more stable over time.

**33:36** So we get more sustainable landscapes with greater longevity.

**33:41** I have a series of slides here that I'm not really going to show because they simply illustrate how we are operationalizing...

**33:49** ...this process with interaction among our different stakeholder groups. The process of individual iteration analysis...

**34:00** ...communication, action, reflection leading back to analysis communication.

**34:07** And then multiple iterations across time leading eventually then, to the production of a design outcome...

**34:17** ...and a whole series of acyclical processes going on. Skip over that and thank you very much.

**34:26** Thank you.

**34:30** Our next speaker is Tom Paradis, who's the chair of the Department of Geography, Planning and Recreation...

**34:35** ...at Northern Arizona University. And they are just about to start a new bachelor's degree in geographical science...

**34:41** ...and community planning. So, Tom, you're up.

**34:48** Alright. Okay, hi everyone. What I'd like to do today is share with you an overview, kind of what you might call...

**34:58** ...the view from 30,000 feet. A new curriculum for a bachelor's of science degree at NAU in Flagstaff.

**35:05** And this, just by way of a general introduction, was a process that, as Dave DiBiase reminded us yesterday, can...

**35:16** ...probably take 18 months to two years, something like that, to complete, if not more.

**35:21** And so, we went through that process of a pretty extensive curriculum mapping approach to curriculum design.

**35:29** And I'm going to show you briefly what came out of that today, and the degree that we actually launched this last fall.

**35:37** And if you want more details about the actual courses and the sequence of the program and so forth, Shannon...

**35:43** ...was nice enough to allow me to put these things out on the table where the other books are outside so you can...

**35:50** ...grab one of those on your way out if you choose.

**35:53** And this actually, I was interested in sharing. We call these rack cards at NAU because, I guess they fit in a rack, and...

**36:03** ...we hand these out to students for all the disciplines, all the majors, as appropriate, to share with...

**36:08** ...students what some of the degree programs are. And so I thought this was kind of a neat way.

**36:13** And we designed our own, of course. We are now in the promotional phase of this new major.

**36:18** So I think I'll leave it to you to decide, you know, in what ways is this a geodesign program.

**36:24** In what ways, and I'll show you some ways in which we are moving forward with some ideas for implementation...

**36:32** ...of geodesign. We've got a few things though, that we think we're doing constitute a geodesign approach.

**36:39** So, again, the view from 30,000 feet basically without all the coursework to go through in five minutes here.

**36:47** We're looking at a degree that's 43 to 44 credit hours and we called it geographic science and community planning.

**36:55** I think this is one of the longest-named majors on campus, and this was an issue for us in terms of compromise...

**37:02** ...but we were concerned about calling it geodesign as of last year, since we still felt, as a faculty, that it was...

**37:09** ...still a relatively new concept and would students really understand this?

**37:13** At least then we have a shot at them understanding geography and planning.

**37:16** So once they're into this program, we start introducing geodesign concepts with them.

**37:22** So some of the highlights here. It is an experiential learning approach.

**37:28** We have six credits now devoted to experiential learning, getting them outside of the

classroom.

**37:32** And this includes possible internships, especially for those going into planning, as well as potential study...

**37:40** ...abroad and things like that. The senior capstone is a university requirement, which I'm a big fan of, and we...

**37:47** ...have two capstone courses. One of which you'll see very briefly in a moment.

**37:51** Writing across the curriculum.

**37:53** We're making sure that our students, in the best way we can, can write within the disciplines, both...

**37:59** ...geography and planning. Can move back and forth within that.

**38:02** And so, every semester, well, I should say every year at least, they have a writing requirement, including...

**38:08** ...a junior-level writing requirement in the major.

**38:12** The introductory courses, we actually revised a few courses based on the learning outcomes we were interested...

**38:17** ...in having the students learn from the beginning. And those are the three introductory courses which the majors...

**38:24** ...take, and they're all also liberal studies courses in our general education program.

**38:29** So that is often how they discover our majors. And two optional emphases. We have 18 credits each.

**38:38** If for those students wanting to get careers in the geospatial sciences, or as a community planner, or community...

**38:44** ...development person, they can take those emphases and still retain those career paths through this degree.

**38:50** So kind of a breadth to a depth scenario. And then this is a scaffolded curriculum design.

**38:55** And, you know, not much time to talk about that today, but the idea is that the students are looking at skills development...

**39:01** ...throughout the sequence, throughout the courses, so that each course is not an individual silo.

**39:07** The faculty are talking to each other as much as we can so that we know what's happening in each course moving...

**39:12** ...along so that hopefully the students, we will be able to depend on skills coming into one class from another by...

**39:20** ...the time they reach the capstone. So, I mean that's the ideal situation. Talk to me more

about reality sometimes.

**39:28** So, the fundamentals of geodesign. Why we think we're headed towards this geodesign approach.

**39:35** And again, we have some specific areas we'd like to improve on as some of the other presenters mentioned, as well.

**39:41** But we see this as an interdisciplinary degree. We already have the geographers, the planners, the GIS folks...

**39:47** ...within our department and we're taking advantage of that. So that is one of the strongest aspects of this.

**39:56** That we all talk to each other. We actually like being around each other and we created this combined degree to do all of this.

**40:05** To allow students to experience what is happening now with GIS and geography and then helping to design the future.

**40:12** That's kind of the idea. Local and global sustainability. This is one of the general themes of the major, whether they...

**40:18** ...go into geography or planning, or combinations of that, and GIS and emerging technologies.

**40:24** This is a strong suit in the department. This is not one of my strong suits. I'm just helping lead the effort on this.

**40:30** We have several very competent professors in GIS-type technologies and so we think we can really build that in...

**40:42** ...to make an effective curriculum. The capstone project in about 30 seconds' worth.

**40:48** Professor Dawn Hawley teaches this, and the last time she taught it was this past semester and this is the type of thing...

**40:57** ...right now that incorporates GIS, Google Earth, Google SketchUp, those sorts of tools, and we only discovered...

**41:05** ...Google SketchUp a few years ago.

**41:07** And she is really adamant in combining more of the GIS and Google SketchUp, pulling it in and out of those...

**41:13** ...mediums like you've seen here at the summit. And so, we're moving towards that direction.

**41:18** But this is an actual site plan which the students conducted a 3D image of a, of the sites along US Route 66 in Flagstaff.

**41:28** And so they're working with a city project. The city actually gave them this design.

**41:32** They're working with the faculty and the students, and the students actually presented this.

**41:38** It actually has a small book that comes with it that the students created.

**41:42** So this is just a snapshot, but they actually were required to present this to the city and obtain ideas and feedback from them.

**41:50** So this is something that happens every year in one of the two capstones.

**41:55** Well, on the academic side, I couldn't resist this, and I take a full confession for this one.

**42:02** I wanted to see how Carl's geodesign framework fit into our major that we were designing.

**42:09** And so myself and another faculty member, we sat down and thought, well, where do our courses fit?

**42:16** And this is an actual interesting way that I thought to map out our courses onto the geodesign framework to...

**42:24** ...see where these things fit. And I think an important lesson here is, you know, this is just an academic exercise at this point.

**42:32** Important lesson is that not all courses need to be teaching everything in geodesign.

**42:37** You can have courses out here on the periphery as long as they're pointing to other things and helping train the...

**42:43** ...students in different areas, you can come back to that.

**42:46** And geodesign is more of a synthesis, as we saw in one of our last presentations.

**42:51** So it was an interesting exercise that some of you may want to go through sometime.

**42:56** And some quick takeaway tips. My big suggestion is kind of like what we looked at.

**43:00** What are you already doing? What do you have in place? What faculty do you have who are working together well?

**43:05** What kind of contacts do you have around the university to turn into opportunity?

**43:13** So turning adversity into opportunity. This started as a mandate for us to actually combine programs.

**43:20** We lost faculty members due to budget cuts, retirements, and so forth. It was like we were doing too much.

**43:25** How do you combine things? So we turned that into this opportunity. Patience is a virtue.

**43:30** This takes a long time, and you're not going to do all of the geodesign things you want to do overnight, in the...

**43:36** ...next half year, in the next two years. And then finally, applied learning is vital.

**43:41** We've seen all of these examples today of applied activities--what some call learner-centered education, outcomes-based...

**43:49** ...approaches and all of that jargon from higher education.

**43:52** But it's vital to have our students learn deeply as they move through the curriculum. And I think that's it.

**44:00** Here's some further information if you want it.

**44:03** Okay.

**44:06** Our final speaker is Boykin Witherspoon, who's the geospatial research manager at the Water Resources Institute...

**44:12** ...at Cal State San Bernardino. He's also taught at Washington, Oklahoma, Cal Poly and worked for a while at Esri. So, Boykin.

**44:23** Oh, thanks. This is the question that Tom asked us to address, and so I'm going to focus on one of the challenges.

**44:31** I also want to let you know that what I'm going to talk about is specific to landscape architecture and teaching...

**44:38** ...in landscape architecture.

**44:39** And I realize there's a lot of other disciplines here, but I'm talking specifically about teaching landscape architecture.

**44:50** So when I got that question from Tom, I started thinking, you know, what do I need to answer that question?

**44:55** And one of the things I thought I needed was, well what did we used to do to help define what are the new challenges?

**45:04** In 1987 at LSU, go Tigers, it's a good year to be a fan, Jon Emerson and Wayne Womack taught what they...

**45:13** ...called the landscape design method.

**45:14** Now they did not invent this, but that's what they taught. And it was, you did inventory, analysis, concept, and design.

**45:21** And this was linear. The idea was, if you knew those first three, then you just make decisions.

**45:29** And it seemed to work pretty well. If I tried to iterate, Jon would come around with a ruler and rap me and...

**45:35** ...say I have analysis paralysis. So it seemed to work pretty well, but what was really interesting that I learned from...

**45:44** ...them also, was that the formation and use of a concept is critical in differentiating the profession of landscape...

**45:50** ...architecture from the other development professions.

**45:54** The fact that we design with a concept is one of the things that sets us apart. It's what makes us special.

**46:03** Which translated means, this is why people will pay you. This is what's unique about your profession.

**46:10** And then also, the profession of landscape architecture outside of academics has built a 100-year-plus business model...

**46:17** ...and billing structure to their paying clients based on a method like this.

**46:21** And I talked about that at the Esri User Conference, but that's another challenge that we face, is congruency with that.

**46:29** So, what's different? In the geodesign method, one of the big differences is the inventory has gotten really, really big.

**46:40** The inventory that I was taught, you walked out on the site with a piece of paper and you sketched the site and you used...

**46:45** ...your newly found plant ID knowledge and you drew an arc of where the sun supposedly went, and that was inventory.

**46:52** So the inventory is much, much bigger now, and that's very, very different. Especially when you think about the...

**46:57** ...billing structure to clients. But then the other real big difference here is the design analysis has been combined...

**47:04** ...and is simultaneous that you get feedback as you're designing. You don't have to finish the design.

**47:10** So those are very, very different. So, and that's where I began to realize the challenges.

**47:18** So I have not seen the word concept used in geodesign yet. Now I did hear Bill Miller mention the word ethic as...

**47:25** ...something that's potentially missing. I actually believe the concept in our traditional design method is equivalent...

**47:32** ...to the ethic, and I do believe it's missing from geodesign.

**47:36** So when we tack the word design onto the word geo and say we're going to teach it to landscape architects, shouldn't...

**47:41** ...we be teaching something different than a civil engineer? You know, eventually we can collaborate, but there's...

**47:47** ...something that makes landscape architecture unique, or why will people come pay for our degree, or pay for our services?

**47:54** And so it's what makes us necessary. It's what's always made us necessary, is our solutions incorporate concepts.

**48:02** Now this is my opinion, and I do have a degree in fine art, so I do consider myself an artist also, but it's the difference...

**48:09** ...between optimizing solutions based on a rule set, or being an artist.

**48:13** And again, that's what makes landscape architecture unique.

**48:17** So, I had to have a graphic. From the perspective of a landscape architecture, and this is how I explain the missing ethic, or...

**48:26** ...concept, is what if design is a car, and you lift up the hood and it's not a Hemi driving that, it's a concept.

**48:36** And so now we've tacked the word geo onto design and we've got a bigger car, which is probably good, but the...

**48:44** ...engine seems to have fallen out a ways back, and we're moving forward with nothing under the hood.

**48:49** No ethic, no concept. And nothing under the hood, again in my opinion, means we're just optimizing solutions, we're not...

**48:57** ...designing in the landscape architecture sense, anything.

**49:01** So ignore the top part, I'll come back to that in a second. But in my opinion, what geodesign is really doing is...

**49:08** ...offering designers the prospect of avoidance. Avoidance of anything not good.

**49:14** And one of the difference is, it does it real time as you're drawing. So that's what I think it does.

**49:21** So could geodesign promote the avoidance of that which is not good by using a traditional design concept...

**49:28** ...to gauge what is good and not good? Can we put that ethic, that concept, into the analysis engine?

**49:35** And that's what I'm trying to show at the top. That's what I'm working on right now, is how do you shoehorn that concept...

**49:43** ...back into all that scientific analysis and feedback, because the science and all of that tells you good or bad, but it...

**49:50** ...does not tell you the whole story of good or bad based on what my profession believes.

**49:58** So I think our challenge, this is our challenge, and the challenge is nothing less to stay relevant as a profession as this...

**50:05** ...technology changes. And what, again, what we're working on is, can we make the simultaneous analysis in geodesign...

**50:13** ...be driven in at least part, by a concept. Thank you very much.

**50:20** Good. I think we'll have our speakers come up and have a brief conversation. And let's see, I think...is John Wilson still in...

**50:31** ...the audience? He wanted to join us too. If you want to join...they...USC, as you know from booths outside, has a...

**50:39** ...new program, and I think that maybe my first question to all of you is, what do you consider to be, and come on...

**50:48** ...down John, what do you consider to be sort of the core skills of geodesign that sets it apart from the other disciplines that...

**50:56** ...you know, we have traditionally thought of at landscape architecture, geography, what have you?

**51:01** Now Boykin, you just made the argument that it's missing something, but what do you think are...

**51:06** ...what would be, what would you would define as the core set of skills? Anyone want to jump in?

**51:13** Yes, go ahead, Karen.

**51:14** Well, I think the core set of skills is based on what your original discipline is, because I don't think geodesign is limited...

**51:22** ...to designers. You know, as we have seen, design is getting more and more interdisciplinary.

**51:29** And so the core set is whatever set of skills you need for your home discipline, and then in addition, the geospatial skills.

**51:39** And the, you know, we're doing more and more dashboards. We need to understand the logic and a bit of the math...

**51:46** ...that goes with that.

**51:47** So you would argue that essentially it's a part of existing disciplines with a set of, sort of additional skills built into that.

**51:54** Right.

**51:55** Does everyone agree? Others? Janet?

**51:57** Well, I thought what Boykin was hitting on with concept kind of paralleled what I was trying to say with spatial form.

**52:05** Is that it gives, you know, it's that artistic touch, in a way, that is spatial, and that doesn't have to be unique to landscape architecture.

**52:17** I think any of the disciplines involved in geodesign project could develop that kind of concept, form-giving concept.

**52:26** I guess I would add also, that in the end, I don't think we can forget about the fact that people are experiencing the places...

**52:34** ...that we're making. Whether they're large regional landscapes, or whether they're sites, or whether they're communities...

**52:43** ...you know, these places are being experienced, and I think there perhaps is a tendency in some contexts, to lose sight of that.

**52:53** And to just, you know, put boxes out there and put palms out there, and that's design.

**53:00** Yeah, right. Tom.

**53:01** I could add onto that too, the idea of...is my mike on?

**53:05** Not yet.

**53:06** Okay.

**53:07** Now it is.

**53:08** There it is.

**53:09** There you go. You're on.

**53:10** Thanks. I'd add on to that concept also, that students really need to stay in touch or get in touch with the local community...

**53:19** ...as you said, with any design project, or even research project that they're doing.

**53:24** If it's a combination of research and design, either throughout a curriculum, or in a course, they need to connect...

**53:31** ...with, as Carl calls it, The people and the place.

**53:34** And that is something that we really can't lose sight of as a skill, is that public participation side of it.

**53:40** Yeah...yup. You know, the three of you in the center are developing new programs, right? New either in...

**53:47** ...currently, or about to, right? Philadelphia, USC, and Northern Arizona.

**53:52** What have been some of the challenges that you've encountered in getting acceptance of geodesign and...

**53:59** ...getting these programs under way that we could all learn from? Any one of the three of you? John, maybe since you're new...

**54:06** ...and we haven't had a chance to speak yet, I'll call on you.

**54:09** Can everybody hear me, since I'm not miked.

**54:11** Oh, okay. I'm a soccer coach, so my voice can go a long way.

**54:15** Okay.

**54:17** I think you have to understand your audience and talk to the audience, so the answer to the previous question would...

**54:23** ...have varied depending on who I was talking to. So if architects and landscape architects...

**54:27** Should I...There we go. Thanks, Shannon. Good idea.

**54:31** Start over.

**54:32** ...geodesign brings...

**54:33** Thanks.

**54:34** ...more data, perhaps more science, to the design enterprise. For planners it offers a vehicle to plan from the...

**54:42** ...bottom up, rather from the top down. And for geographers and others that are heavily vested in GIS, it turns...

**54:49** ...your attention from thinking about the past and how we got to the present, to what the future might be.

**54:55** And for me, if that's not enough all by itself, the next thing is, well, the status quo. If we just do business as we've...

**55:01** ...done for the past hundred years, do you think the planet will be in good shape in another century? And the answer's no.

**55:08** So maybe we should change it up. So that's enough.

**55:12** Okay, good. Jim or Tom, any thoughts about it?

**55:14** I think there's a lot of competition right now and...within the university for programs and for you to step up to the challenge of...

**55:23** ...explaining, of proving, why yours is interesting, why yours is valuable to the university, and more so to students and practitioners.

**55:35** I think that's a tough thing to sell. And it takes a lot of work. And on the logistics side, just finding space, finding the...

**55:43** ...right kind of environment within the university to bring all of these disciplines together and have them...

**55:50** ...interact in a way that is going to meet your goal.

**55:55** Yeah. Tom, and then Karen.

**55:57** I think one thing, real quick. I think my mike went off.

**56:00** Hello.

**56:01** There you go.

**56:02** Yeah, you're on.

**56:03** Okay. One of the challenges I foresee immediately in our new program is to actually

encourage the students who...

**56:09** ...traditionally want to study planning and those who want to study geography, or GIS, to talk to each other.

**56:14** And that is the idea of combining some of these courses and materials, so the planners are learning how to do research...

**56:20** ...and where research and knowledge comes from, and the geographers are learning the skills of design and planning...

**56:25** ...and community participation, which geographers like me were never a part of before.

**56:30** So it's the student mix which I think we're going to...and I think it's definitely surmountable, but as a faculty we need to make...

**56:38** ...it clear to students why they're doing what they're doing.

**56:41** Yes, Karen, did you want to...

**56:42** A group of us who are the geodesign consortium put together a survey, and we sent it out to 178 programs of landscape...

**56:52** ...architecture and planning, and the responses that we've received, one of the questions is, What do you see...

**56:59** ...as the biggest challenge? And the number one challenge that we've been...we've gotten back through our feedback is...

**57:08** ...a lack of understanding of the potential for geodesign among universities, among departments, and among administrators.

**57:19** Yes, Boykin.

**57:20** Another part of that survey exposed that there is a general consensus that the need and demand across all departments for...

**57:29** ...GIS and geodesign will increase.

**57:32** Right. So, on that, part of this session is really about where geodesign is going. So what do you see in five years...

**57:40** ...ten years from now, and what do we need to do differently in order to get there? Any thoughts about the future?

**57:51** I'll jump in...

**57:52** Okay.

**57:53** ...and say that I think a lot of it is going to depend on how quickly some of the more innovative tools evolve.

**58:02** And, I mean, a lot of the things that we're challenged with right now are, as I said earlier, helping students see the...

**58:09** ...impact of their decisions, their designs. And so, if you take something as simple as a grading plan, how do you...

**58:17** ...see what that looks like, or, you know, it's a bit of a disappointment that we're not able to do that right now.

**58:24** I mean, we're not able to...we don't have something that is CityEngine-like that responds to those kinds of engineering rules...

**58:34** ...and when you move something you know the impact of moving it immediately, and it's based on all of those principles...

**58:44** ...of safety and things that you have to do, but as a designer, you really don't want to be worrying about.

**58:54** Right.

**58:55** So things evolving, like CityEngine and other tools that are going to make it easier and sort of embed a lot of that...

**59:03** ...stuff that we don't want to have to worry about. Let us worry about the design.

**59:07** Yup, good. Yes, Karen?

**59:09** In practice we see a lot more integration and, in fact, in the design disciplines we see integrated practice.

**59:18** And I think that one of the things that has to happen and one of the things that will happen is that the silos...

**59:23** ...will start to break apart in universities. And once that happens, then, you know, the door will be open for geodesign...

**59:32** ...across the university.

**59:34** Right. David?

**59:35** Sort of a subtext that I sort of picked up from the presentations at the meetings last two days, on the one...

**59:43** ...hand, there's all this gee-whiz magical mystery tour stuff, you know, that's really, really cool, you know, and it...

**59:50** ...does all these really, really great things, and on the other hand, there's people that actually have to make decisions.

**59:56** And, you know, whether you're talking about a cyclical process of making decisions, or a linear process of making...

**1:00:02** ...decisions, somebody eventually has to make decisions. And I guess where I would hope that geodesign is going is...

**1:00:09** ...that the magical mystery tour will become even more accessible to the people that actually have to make the decisions...

**1:00:17** ...and that there will be capacity for those decisions to be evaluated, reevaluated in a very cyclical process.

**1:00:27** Yeah, great, Janet?

**1:00:30** I'm going to follow up on Karen's.

**1:00:31** Okay.

**1:00:32** I think geodesign could be itself a silo breaker, or, you know, facilitate that and I'm thinking now a lot about...

**1:00:41** ...the GIS course I have coming up, which is interdisciplinary, cross departments.

**1:00:48** And really thinking about bringing geodesign concepts into that as a way of facilitating conversation and ideas...

**1:00:58** ...among students from different programs.

**1:01:01** And the other thing that...along with that, that I think we need to be thinking about for moving it forward is really...

**1:01:08** ...moving now to encouraging use of the web-based GIS to facilitate collaborative geodesign and collaborative GIS.

**1:01:21** Good. Is there a question from the audience?

**1:01:25** Yes, David?

**1:01:27** [Inaudible question from the audience.]

**1:02:22** ...to assure the mobility of students and faculty and ideas within that region, who is going assure that critical...

**1:02:32** ...intellectual habitat is preserved? Who's going to assure that a waste treatment facility is appropriately sited so that...

**1:02:41** ...bad ideas can be discarded with minimum impact on the rest of the region? In short, my question is, is the design of...

**1:02:50** ...the geodesign education enterprise going to happen by design, or by happenstance?

**1:02:56** Good question. Who...David?

**1:02:58** I just want to say that..Janet mentioned silo breaking and geodesign as being silo breaking, and I know that at Minnesota, we...

**1:03:08** ...had a bit of a silo-breaking experience. The university decided to create something called Institute on Environment.

**1:03:15** And Institute on Environment was a multidisciplinary set of folks that got together and are gradually becoming at least...

**1:03:24** ...interdisciplinary, and I truly believe that...I think geodesign is really a transdisciplinary

perspective of integrating the...

**1:03:35** ...capacity to think spatially with the capacity to collaborate and make collaborative decisions with the ability to...

**1:03:47** ...communicate...

**1:03:48** Right.

**1:03:49** ...and represent.

**1:03:50** And sort of following your question, David. You're...seem to me you're suggesting that we do that across institutions...

**1:03:54** ...not just across disciplines, right? Thinking regionally. Others want to take on that? Tom, and then Karen.

**1:04:02** I think right now, one of the biggest challenges and opportunities is the cross-disciplinary aspect because of the silos that...

**1:04:07** ...most of us are in. And so, when you're looking at regional scales, or, you know, between the local and regional, and...

**1:04:16** ...even larger than that, perhaps, you might find opportunities to pull in other disciplines.

**1:04:23** And I think it's probably a mistake to...I'm not sure anyone's thinking about this, but to say, Well, which scale fits best...

**1:04:31** ...into a geodesign framework. We've seen examples at this summit and last year's summit alone where you're...

**1:04:37** ...taking geodesign at the building and floor level, and then you're extrapolating out to entire regions, watersheds...

**1:04:44** ...and cities and metropolitan areas. So with the scales alone, you're dealing with a lot of different disciplines...

**1:04:51** Right.

**1:04:52** ...from the architecture and construction management areas, at the other end of the continuum, to your regional...

**1:04:56** ...planning, you know, disciplines for design, and everything in the middle.

**1:05:01** Yeah, great. Yeah, Karen?

**1:05:03** I think with the budget situations that many universities are facing, there are some really crazy things going on right now...

**1:05:10** ...and there are some decisions being made. Some of them are thoughtful and some are not thoughtful.

**1:05:17** And in order to make this not an accidental progress, I think things like Bill Miller's white paper are very important, you...

**1:05:28** ...know, if we had a white paper about the curriculum for geodesign that, you know, people who are forming...

**1:05:37** ...new programs could refer to and share with their administrators, you know, it may not be so haphazard.

**1:05:47** Good. Another question. There's two of you right next to each other.

**1:05:55** Is this on?

**1:05:56** Yes, go ahead.

**1:05:57** Do I need to stand up?

**1:05:58** Ah...

**1:05:59** Okay. I come from the professional side of things, so I'm not an educator by any means, but I have done a lot of...

**1:06:07** ...education, and two...this is a two-part question. So the first is, when professionals ask you, you know, there's a certain...

**1:06:14** ...level of competency that we need to achieve in landscape architecture, and civil engineering, and GIS...

**1:06:20** ...we haven't even regionally, or you know, US-wide achieved a certain level of competency requirement...

**1:06:28** ...for landscape architecture. And GIS, GIS professionals are still in the process of developing their registration...

**1:06:35** ...requirements and licensing. When you create a geodesign professional, what are you creating that in a professional...

**1:06:43** ...world, makes you that expert? It's sort of...I totally understand the value and the technology, and I love the...

**1:06:53** ...concept, I'm just trying to understand...

**1:06:55** What's the expertise?

**1:06:56** ...registration-wise professionally, where is that job? Where is that definition in the goal to get one at the end of your education?

**1:07:06** John?

**1:07:08** There's two answers. So one would be to ask whether we need more specialists. Perhaps we need more generalists.

**1:07:15** So that would turn the argument on its head. The second is, you know, I'm actually developing...I'm the lead person...

**1:07:23** ...trying to develop a program that would create a bachelor's degree.

**1:07:26** And so, there are lots of people here that think the appropriate level is the master's.

**1:07:30** And so, one of the reasons we're focused on the bachelor's degree, is that we already have existing master's degrees...

**1:07:36** ...in landscape architecture, and geographic information science, and planning, and what we think we could do is...

**1:07:43** ...to have a progressive degree where you get a bachelor's and a master's in five years that are those combinations, or...

**1:07:50** ...some other combination, like environmental science.

**1:07:53** And if you did the kinds of geodesign interdisciplinary bridge-building things as an undergraduate, then they...

**1:07:59** ...would be a framework that you could build on with the things that you found most interesting.

**1:08:04** And I have the expectation that those people will go out maybe within the existing sort of licensing and certification...

**1:08:10** ...structures, and the real test is whether they emerge as leaders. You know, and maybe not in 5 years, but in...

**1:08:17** ...17 years, if you have another meeting like this, would I have a bunch of graduates standing down...

**1:08:21** ...here with best examples, best case studies, best new tools? To me, that would be the judgment about whether...

**1:08:29** ...I was successful, or not.

**1:08:32** Anyone else? David?

**1:08:33** I was just going to say that I think perhaps a way to think about that, and it's a very valid issue, but perhaps the...

**1:08:39** ...way to think about that is that geodesign becomes a certification, as opposed to a licensure, and it becomes...

**1:08:47** ...a certification that multiple licensures can address. And in that context, then, it sort of forces some commonality...

**1:08:57** ...in some kind of a certificate curriculum, but it allows it to be applied to architecture. It allows it to be applied to GIS.

**1:09:09** It allows it to be applied to geography. It allows it to be applied to planning, to landscape architecture...

**1:09:17** ...as a sort of a post-professional certification process.

**1:09:22** Let's see, Boykin?

**1:09:24** I think you asked your question wrong. I think the question is, who will pay for that service?

**1:09:32** And I think that's what we need to define is, we need to begin to look at our existing billing structures, who are...

**1:09:39** ...our current clients, what's going to have to change in their expectations of the services that we provide?

**1:09:48** And so, I think that's one of the other challenges that I alluded to, is in our professional business models...

**1:09:54** ...we need to make sure that we're not doing something that no one wants to pay for.

**1:10:01** Bill, maybe our last question. Is that okay? Good. You get the last word.

**1:10:07** Last question.

**1:10:08** Do you want to stand up?

**1:10:09** Oh sure.

**1:10:13** There you go.

**1:10:15** Okay.

**1:10:16** Am I on?

**1:10:17** Okay, good. What if I said that geodesign, with respect to your professions, was not a certification program or degree...

**1:10:24** ...program, but it was like iteration. Design is an iterative process. What if I said geodesign was similar to iteration...

**1:10:33** ...in the sense that it's part of the process of designing, not a particular degree program, or a certification program, how...

**1:10:39** ...would you answer that?

**1:10:42** Yeah, Tom.

**1:10:44** I think a short answer to start, from my perspective is, Bill you're right on the money there.

**1:10:49** That education is an iterative process, and I realize this is jargon in higher education at this point, but what we're looking...

**1:10:57** ...at in higher ed is the idea of preparing students to learn beyond our formal curricula.

**1:11:03** Students have been shown to actually learn best outside the formal curricula, which leads to the experiential learning and...

**1:11:09** ...all of that. So the idea is that learning is an iterative process. So is this. Do our students need to learn a specific set of...

**1:11:18** ...skills, I mean skills in terms of GIS software, and so forth. Specific software packages.

**1:11:24** Maybe they can learn one or two and learn to think with those, because it's the thinking process, I think, is most significant.

**1:11:31** Having the students be able to get through that process of education, and then continue their own education beyond that...

**1:11:37** ...because that's what going to happen. You know, we call it lifelong learning.

**1:11:42** But no longer are we expecting students to actually learn all of the content, all of the material that we think they should learn...

**1:11:49** ...in four years, or in a master's, or PhD program. It's going to go beyond that.

**1:11:54** Yeah. Go ahead, Jim.

**1:11:58** I think that there's an opportunity for geodesign to be a specialty in education, but maybe not in a profession.

**1:12:12** And so, I think there's a real need now to move ahead in...I mean, technology is moving so quickly and to try to keep...

**1:12:21** ...up with that and build that. I don't know that it's reasonable to build all of that into an undergraduate program, but...

**1:12:29** ...maybe a graduate program. And that the professions need to drive that. They need to drive that need, but I don't see it...

**1:12:36** ...being necessarily a specialization, even in the professional world. But in education, I think there's a great opportunity for it.

**1:12:44** Good. Any final? Well, thank you all. You did a great job. Thanks. Join me in thanking our panelists, and good questions too. Thank you.