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1. Frontmatter

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mathematicalgeography.com; instituteofmathematicalgeography.org;
instituteofmathematicalgeography.com

2. Editorial: Roger Rayle—Turning Science into Action

Rayle has been a frequent contributor to *Solstice* (2008, 2010, 2011). Even more frequently, he will be found giving a digital presentation, complete with animation, of the history (and current status) of the 1,4 dioxane plume that has lain (somewhat dormant) under a portion of Ann Arbor for decades. He has devoted the past three decades of his life to serving as a scientist watchdog for the Ann Arbor community so that the water under the City is better for future generations. His is a forward-looking venture and represents the ultimate in linking long-range planning and environmental science/activism with civic leadership and political action. For his efforts, Roger was awarded the locally-prestigious 2012 Bezonki Award from the *Ann Arbor Chronicle* (Morgan, 2012) as well as a variety of other awards/recognition from local environmental groups.

And... in addition to being co-founder/chair of Scio Residents for Safe Water (SRSW), he also helped set up and is now chair of the Coalition for Action on Remediation of Dioxane (CARD), an advisory group of local government representatives and citizen groups (including SRSW) keeping tabs on the dioxane contamination and cleanup. Since its creation in 2006, the group meets monthly to review data, reports and actions relating to the dioxane site ... and make recommendations to the Michigan Department of Environmental Quality. and keep the community informed.

Take a look at elements of Rayles's continuing work; he creates interactive, multilayer Google Earth mashups that model the dioxane site as close to reality as possible so that any stakeholder can better understand site issues. He keeps many of his digital files posted at the website of SRSW: <https://www.srsw.org/>

View, through this direct link, a 3D mapping animation of the Dioxane Readings, 1986-2017: <https://youtu.be/UKnkfRY2VX4>

Read about some of his previous endeavors in *Solstice* articles cited below (Rayle, 2008, 2010, 2011). Or, peruse a hard-copy reference involving some of his work—he has a chapter in a forthcoming book, *Spatial Thinking in Environmental Contexts* (Arlinghaus et al., 2019).

All in all, browse the valuable collection of materials that Roger has created; encourage students to do so, too. These digital materials are a model for turning science into action.

References (all links last accessed December 10, 2018):

- Arlinghaus, S., Kerski, J., Larimore, A., Naud, M. *Spatial Thinking in Environmental Contexts: Maps, Archives, and Timelines*. 2019. Boca Raton: CRC Press. Rayle, Chapter 10.
- Morgan, Mary. (2012, August 2). Milestone: Celebrating Our Community. *Ann Arbor Chronicle*. <http://annarborchronicle.com/2012/08/02/milestone-celebrating-our-community/>
- Rayle, Roger. Publications in *Solstice: An Electronic Journal of Geography and Mathematics*. <http://www.imagenet.org> ; also: <http://www-personal.umich.edu/~copyright/image/solsticearchive.html>
 - 2011. Volume XXII, No. 1. Pall-Gelman Plume, A Contemporary Google Earth View (Available only as a kmz file).
 - 2010. Volume XXI, No. 2. Google Earth: A Platform for Open Data.
 - 2008. Volume XIX, No. 1. Google Earth Applications in a Community Information System: Scio Residents for Safe Water.

3. Cascade: Observation and Challenge **Sandra L. Arlinghaus**

“Cascade” is a word that perhaps calls to mind tumbling water, falling over large rocks in an ever-escalating pattern of motion, covering the rock that provides it structure. The word, ‘cascade’, is itself also interesting...is it onomatopoeic as it tumbles out of a mouth that forms the first syllable and then the second one? Perhaps. The point is, the concept of ‘cascade’ may present itself in many forms, from the obvious to the esoteric.

On recent trips on the Amtrak Crescent (Figure 1 shows a route map along with distances from Meridian to various cities, a context), a passenger train that travels from New York City to New Orleans, Louisiana, I had the opportunity to observe a giant green cascade draped over trees, telephone poles, shrubs, railroad ties stacked at the side of the track, and a host of other objects, as the train travelled across the Deep South from Meridian MS to Atlanta GA (and back). It was ‘kudzu.’

Kudzu is a vine, with large dark green leaves, that is all too familiar to residents of the Deep South of the USA. Indeed, it has been called ‘the vine that ate the South’. The reference is to its habit of cascading, as it covers the landscape with its soft, leafy quilt. It smothers all sorts of vegetation, as it snuffs out access to sunshine thus killing what it covers. To some, it resembles a topiary that is out of control; to many others, it is a gigantic vegetative pest; and to a small handful of others, it represents opportunity.

The train offers a particularly fine view of kudzu in its happy southern habitat. The southern pine forest surrounds both sides of the track, with only the right-of-way for the train, occasional parallel roads, and power line cuts, offering extended locations for sunshine to penetrate the otherwise dense pine forest. Some of the forest has been cut, no doubt for various reasons. Deciduous trees often grow at the edge of the forest that gets sunshine. Kudzu drapes itself over whatever might be at the sunny edges of the forest. The images in Figures 2, 3, 4, and 5 show views of kudzu from the train that illustrate these ideas.

As one traverses kudzu-laden forest edges, mile after mile and hour after hour, many questions arise. How did it get here? Where is it from originally? Does it have a natural enemy? What has been tried to control it and why did it or did it not work? Is it edible? By humans? By others? Can it be used as fuel? Are the vines useful in place of other vines? Does it have pharmaceutical value? What opportunities might come about for the commercial food industry? For the art and craft industry?

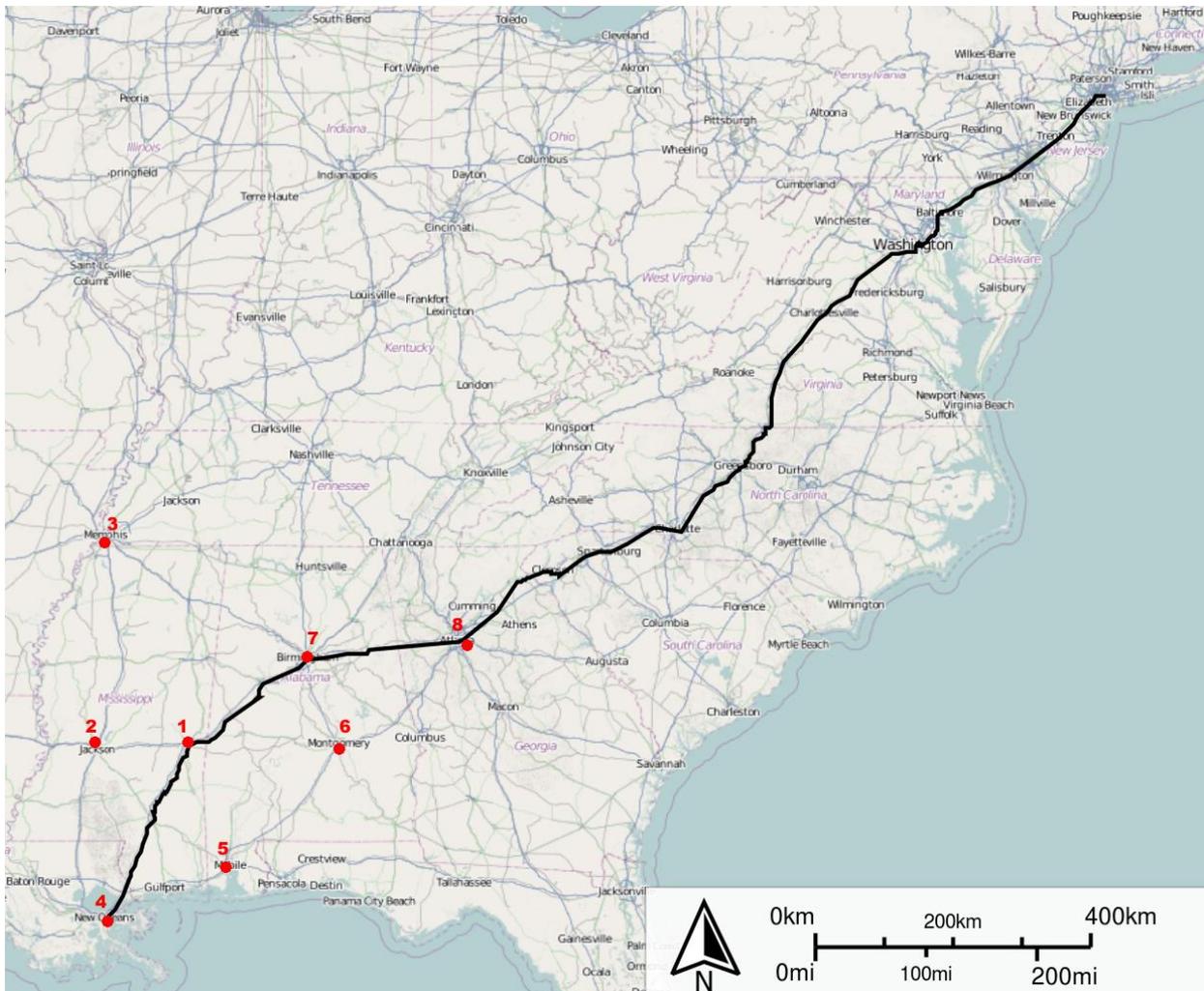


Figure 1. Route of the Crescent, dark line. Wikipedia source [link](#). Numbered red locations (distance from Meridian) —1: Meridian MS; 2: Jackson MS (92 mi.); 3: Memphis TN (232 mi.); 4: New Orleans LA (198 mi.); 5: Mobile AL (133 mi.); 6: Montgomery AL (155 mi.); 7: Birmingham AL (146 mi.); 8: Atlanta GA (290 mi.).



Figure 2. Kudzu up to the tracks and railroad ties. Note power lines.



Figure 3. Healthy kudzu; not-so-healthy tree it is draped over.



Figure 4. Kudzu cascading over bushes, shrubs, trees, telephone poles.



Figure 5. Kudzu here, kudzu there; kudzu, kudzu everywhere! The 'vine that ate the south', indeed.

Answers to many of these questions may be found in online resources (see selection of materials in the 'References' section). Clearly, there is an abundant supply. Perhaps, however, there is not so much demand. The challenge, therefore, is to figure out ways to increase demand. By integrating existing online materials from disparate existing uses for kudzu, opportunities for future, possibly unforeseen, uses may emerge. Such opportunity may become all the more clear when materials are integrated into a single unit that draws space and

time together. The 'cascading' Story Map offers one such possibility [see chapter 14 by Kerski, in Arlinghaus, Kerski, Larimore, and Naud, 2019, forthcoming] that takes natural advantage of the cascading nature of the plant and thus seems particularly well-suited to organizing materials in response to this challenge. Of course there may be others, as well. Stay tuned...

References

- Arlinghaus, S. L., Kerski, J., Larimore, A., Naud, M. 2019 (forthcoming). *Spatial Thinking in Environmental Contexts: Maps, Archives, and Timelines*. Boca Raton: CRC Press. Kerski, Chapter 14.
- Finch, B. 2015. [The True Story of Kudzu, the Vine That Never Truly Ate the South](#). *Smithsonian Magazine*.
- McKee, A. July 16, 2010. [Got Kudzu?](#) *Meridian Star*. Last accessed December 10, 2018.
- Miller, James H. [Kudzu Eradication and Management](#). Chapter 28 in Hoots, D., Baldwin, J. Eds. 1996. *Kudzu the Vine to Love of Hate*. Kodak, TN: Suntop Press, 137-149. Last accessed December 10, 2018.
- Nature Conservancy. 2018. [Kudzu: Stories in Indiana](#). Last accessed December 10, 2018.
- Orvell, T. December 6, 2009. [Bhutan to Atlanta: Baskets Full of Ambition](#). *Atlanta Journal-Constitution*. Last accessed December 10, 2018.
- Science.gov. <https://www.science.gov/topicpages/n/nitrogen-fixing+legume+kudzu> Last accessed December 10, 2018.
- Swearingen, J., Reshetiloff, K., Slattery, B., Zwicker, S. 2002. [Plant Invaders of Mid-Atlantic Natural Areas](#). The Bugwood Network. Last accessed December 10, 2018.
- Treadwell, D. April 23, 1988. [Southerners Once Hated Kudzu but It Grew on Them](#). *Los Angeles Times*.
- U.S. Fish & Wildlife Service, National Wildlife Refuge System. [Volunteers and Invasive Plants](#). 2008. Last accessed December 10, 2018.
- ["Controlling Kudzu With Naturally Occurring Fungus"](#). *Science Daily*. July 20, 2009. <https://www.sciencedaily.com/releases/2009/07/090719185107.htm> Last accessed December 10, 2018.

4. George Mokray, Latest Geometry Links

George Mokray notes that the full archive of Geometry Links is available at:

<http://geometrylinks.blogspot.com>

and that people can subscribe to the listserv by emailing him at gmoke@world.std.com

Below is a recent set of his links that relate in various ways to 'geometry' and perhaps also to 'geography'.

Hypercube - a hi-tech work of art that simulates the appearance of a near infinite amount of light and space, contained within the finite volume of a sleek and futuristic frame

<https://www.kickstarter.com/projects/hyperspacelighting/the-hypercube>

Neolithic geometric cave markings the beginning of written language?

<https://www.newscientist.com/article/mg23230990-700-in-search-of-the-very-first-coded-symbols/>

Nuclear pasta - the hardest known substance in the universe

<https://scitechdaily.com/the-hardest-known-substance-in-the-universe-nuclear-pasta/>
<https://journals.aps.org/prl/abstract/10.1103/PhysRevLett.121.132701>

The Great Pyramid of Giza can focus electromagnetic energy at resonant wavelengths. Physicists now to copy the structure at nanoscale for solar and other applications.

<https://scitechdaily.com/scientists-reveal-the-great-pyramid-of-giza-can-focus-electromagnetic-energy/>
<https://aip.scitation.org/doi/10.1063/1.5026556>

Quantum network architecture and teleportation through a quantum gate

<https://scitechdaily.com/researchers-demonstrate-teleportation-of-a-quantum-gate/>
<https://www.nature.com/articles/s41586-018-0470-y>

Modular canopy reconfigurable by drone

<https://vimeo.com/265752944>

Stabilimentum or web decoration by some species of spiders

https://en.wikipedia.org/wiki/Web_decoration
<https://www.treehugger.com/animals/these-spiders-mysteriously-decorate-their-webs-photos.html>

Noah Deledda's aluminum can sculptures

<https://youtu.be/tilw2vZYPLM>
<https://www.instagram.com/noahdeledda/>

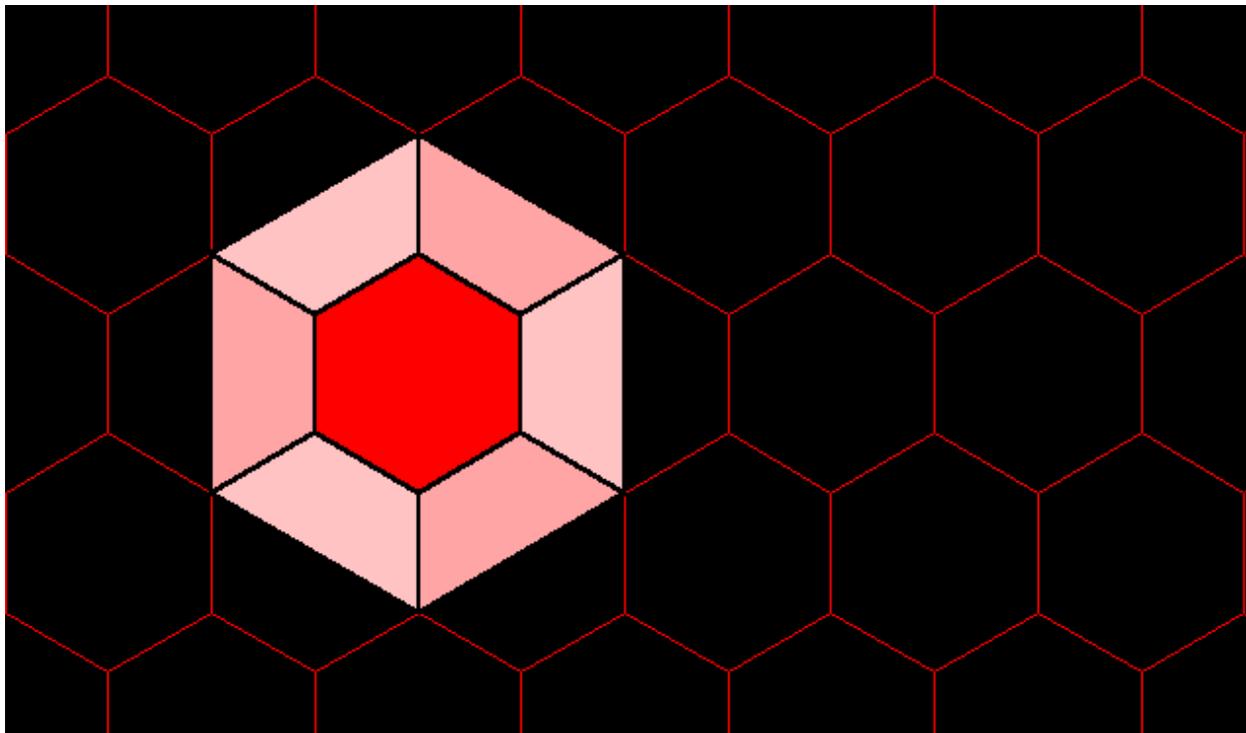
Triply Ambiguous Object - 2018 optical illusion of the year

<https://youtu.be/iA5zBZB2dnq>

Op art book covers animated
<https://vimeo.com/297671782>

The shape of a symmetrical wormhole
<https://scitechdaily.com/physicist-details-the-shape-of-a-symmetrical-wormhole/>
<https://www.sciencedirect.com/science/article/pii/S037026931830563X?via%3Dihub>

Music Animation Machine
<http://www.youtube.com/user/smalin>
<https://www.youtube.com/user/smalin/videos>
http://www.musanim.com/watch_mam.html

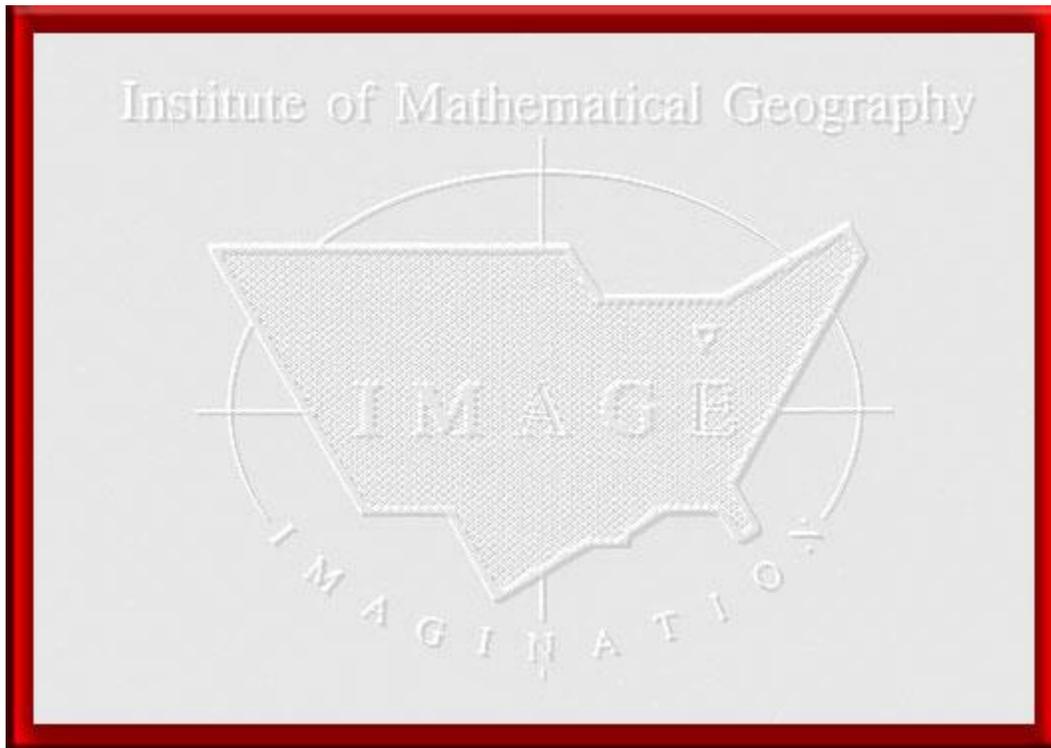


An animated version of the above image (a single screen capture) is attached within the pdf; it represents the mission of IMAge, in fusing content from distinct, but overlapping disciplines.

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