CARTOGRAPHY. MOOC

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Esri MOOC Program (online), April—June 2018

Review by: Tara LaLonde, Pennsylvania State University

Massive Open Online Courses (MOOCs) can help aid participants in their professional development, discovery of a new topic, or application of new skills. This is a review of the Esri Cartography. (pronounced "Cartography, Period" or "Cartography, Full-Stop") MOOC held from April 18, 2018 through May 29, 2018. Courses in Esri's MOOC Program (esri.com/mooc) run in a cycle over four quarterly terms, or sessions, with each individual MOOC lasting six weeks. This particular course aimed to help participants explore cartographic design choices beyond software defaults, and was intended for educators, students, GIS users, and map designers. Hands-on exercises use Esri's ArcGIS Pro to create outputs that are then shared through ArcGIS Online or exported to various formats, including images and videos. During the course registration process, a helpful outline aided in determining whether this MOOC would fit participants' needs.

The course was presented as six weekly lessons, and participants could access a personal online dashboard to track their progress as well as find announcements and answers to common questions. Each of the six lessons began with a brief video, which opened with a lively introduction to the lesson topic from a three-presenter panel, and included segments on a "Map of the Week," a spotlight on a pivotal cartographer, a look at some obsolete analog mapmaking tools, and a discussion of some cartographic design elements to avoid (and why).

Lessons also included two instructional documents in PDF format, ArcGIS Pro project files, a short quiz, and a comment area. A certificate of course completion was provided at the end of the MOOC. The following review includes a brief analysis of each lesson, touching on its strengths and areas for potential enhancement.

Lesson One introduced the term "graphicacy" as the key to understanding how graphics, including maps, are used to communicate messages and information to audiences (Balchin and Coleman 1966). Mapmaking connects artistic and cartographic decisions, while also taking into consideration project constraints such as available time. The Lesson One exercise, which focused on symbology, exposed new users to ArcGIS Pro—its interface, panes, and project set-up—in creating a small-format reference map of Massachusetts. A particularly informative part of the first week's exercise involved the ways that symbol drawing order within a layer could be modified. Options beyond the default selections, such as the creation of a custom color and the modification of a built-in gallery symbol for highways, were also illustrated.

Lesson Two focused on the selection of appropriate projections and on data classification options. The first exercise illustrated the effect of various projections on maps of hurricane data, while the second exposed the learner to multiple data classification methods for thematic mapping purposes. These included natural breaks, quantiles, equal intervals, geometric interval, standard deviation, and manual interval classifications, many of which may be helpful to explore in future mapping projects. Here, and throughout the course, the student was encouraged to explore beyond the software's default settings. One strength of the Lesson Two video and exercises was the explanation of the importance of data normalization when creating choropleth maps—a map type that relies on area comparisons.

Lesson Three introduced the learner to scale and generalization. The "Map of the Week" segment included the well-known John Snow cholera map, which deals with spatial aspects of health phenomena. Some of the "Map Tools" in this lesson may be unfamiliar to GIS and computer mapping technology users; for example, the presenters examined some specialized, adjustable pens used for drawing lines of different thickness. The lesson's first exercise focused on creating a multiscale New Zealand basemap using generalization techniques and scale ranges. An important feature of this exercise, which led the learner beyond the default settings, was a description of how to query a layer based on field values. The exercise also included using the basemap to create a vector tile layer, a data format suitable for use in ArcGIS Online. The second exercise of this lesson focused on thematic mapping, and included choropleth, graduated symbol, proportional symbol, and dot-density maps.

Lesson Four illustrated how the label options in ArcGIS Pro could take time to explore, and why it was worthwhile to take that time. A key message of the lesson was how different a map could look based on the placement and properties of its labels. The first exercise showed how labels could be filtered to include only those in which the user was most interested, through the creation of label classes. The option examples for street labeling—including label priorities, label weights, and font characteristics—illustrated how these changes could impact a map's visual appeal. Another helpful labeling option presented was the use of halos to help visibly separate the label from the map features. While the examples of labeling feature types such as lines, points, and polygons were relatable to many GIS users, Lesson Four also included an exercise on labels as symbols that was informative, but may be used less frequently.

Lesson Five focused on 3D cartography, particularly on 3D symbology and scenes, and included the use of digital elevation models (DEMs) and light detection and ranging (lidar) datasets. Lesson Five's first exercise included a 3D mudslide visualization that incorporated imagery and DEMs to depict the slide's impact, and the second employed a creative and realistic scenario using city buildings, trees, streets, and features to create a 3D map. In the latter exercise, participants learned how to add preset symbology features such as trees, buildings, and icons to the map.

If the user had not previously worked with lidar, elevation, or imagery data, these exercises would provide them with a brief exposure that might, perhaps, interest them in further investigation of this type of data. The urban exercise should appeal to those in city planning and landscape architecture, and prompt them to learn more about the many options for creating realistic, and aesthetically pleasing, 3D maps.

Lesson Six examined mapping across time using small multiples and animated maps. Small multiples depict temporal changes using a series of maps showing the same area and theme at different times. The first exercise of Lesson Six involved mapping earthquakes over time and utilized some of the ArcGIS Pro layout options, such as map frames, and exporting options. In general, layouts were given little attention in this MOOC, which tended to focus primarily on symbology. The second exercise in this lesson highlighted the use of time-enabled layers in the creation of animations. The range of potential animation

sharing options, such as those through social media, was illustrated through the export of the animations to different file formats such as MP4 and animated GIF.

Strengths of this MOOC included the well-made and well-structured videos with optional captions and transcripts, and the well-structured exercises. The panelists in each video helped to frame the weekly topic and offered multiple perspectives to help enhance a participant's understanding of it. In addition, the exercises included a variety of supplemental materials, which could appeal to both newer and more advanced participants. The course exercises explored topics relevant to a GIS user's workflow: from working with geospatial data symbology to the sharing a final product with a wider audience via a web map. In addition, the exercises on cartographic concepts could benefit those new to cartography, as they provided a foundation for more advanced study. From my perspective as an educator, the content on thematic mapping, 3D cartography, and animation could integrate well into a curriculum and into instructional exercises. I find—as, no doubt, do many GIS users—that there are some techniques I use more regularly than others, and this MOOC reminded me of a few useful ones not heavily used on a daily basis.

In addition, this course could serve as a helpful way for ArcMap users to become more comfortable with ArcGIS Pro and to transition tasks commonly completed in ArcMap to Pro. This MOOC could also serve as an introduction to working with ArcGIS Online, which users may want to explore through additional training and MOOCs.

Future iterations of the course could be enhanced by including more connections with the GIS education, government, and business communities through adding links to these Esri communities, which could benefit MOOC attendees. They could also include other relevant sources of geospatial data from ArcGIS Online to use in ArcGIS Pro, such as layers from the Esri Living Atlas. This MOOC was focused on the cartographic aspects of ArcGIS Pro, but the addition of more cartographic reference material from outside the context of that particular piece of software would have been helpful. The inclusion of short quizzes to assess the student's knowledge of a topic was also helpful, and the quizzes could be taken multiple times, but the quiz questions were not always closely aligned with the exercises. While engagement with content occurred primarily through the exercises, the discussion forums were the way to engage with classmates. Some

of the lesson discussion forums, though, appeared to have less dialog than others, depending on the extent participants wanted to respond to each other's posts. These few shortcomings of the MOOC were minor in relation to the cartographic and ArcGIS Pro experience that it offered.

Overall, I found that the experience of participating in this MOOC was positive and informative, as it enabled me to explore ArcGIS Pro's cartographic functionality in a sequenced environment alongside others, during a specified time. The time allowed to complete the exercises and weekly sections was manageable. I would recommend taking this MOOC to anyone who wanted an introduction to cartography, and those who are interested in ArcGIS Pro. Many of the items presented in the Cartography. MOOC could be applied to cartographic design projects, and would help the mapmaker create more unique works. This MOOC could also serve as an introduction to other

Esri training courses and MOOC offerings, as these focus on related topics, such as ArcGIS Online, imagery, and other Esri products. Participation in a MOOC or other self-paced online tutorial is an option for professional development and lifelong learning that GIS users may want to consider in the never-ending task of keeping up-to-date with changes in software technology. A wide range of learning opportunities, including tutorials, webinars, and more MOOC offerings, are available from the Esri training site (esri.com/training), which can help to further one's experience with cartography and ArcGIS Pro.

REFERENCE

Balchin, W. G. V., and Alice M. Coleman. 1966. "Graphicacy Should be the Fourth Ace in the Pack." *Cartographica* 3 (1): 23–28. doi: 10.3138/C7Q0-MM01-6161-7315.

AERIAL AFTERMATHS: WARTIME FROM ABOVE
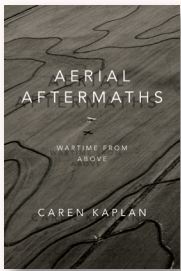
By Caren Kaplan

Duke University Press, 2018

312 pages, 58 illustrations, $27.95, paperback.

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Review by: Jonathan Lewis, Benedictine University

Aerial Aftermaths: *Wartime From Above* examines not only the initial appearance and subsequent evolution of aerial observation, but also the assumptions underlying the creation and interpretation of those views. The author, Caren Kaplan, connects the emergence and development of the aerial view with warfare, and with facilitating the efforts of major colonial powers to control and extract resources from spaces while ignoring their prior uses and depictions. The book begins with a protracted analysis of images from the 9/11 attack on the World Trade Center, taken by individuals and groups of varying official designations. These include photos obtained at ground level by first responders, others taken by New York City's Police Aviation Unit from a short distance above the burning buildings, and still others acquired by satellites and from the International Space Station. This association of aerial views with the state sets

up Kaplan's subsequent chapters on the appearance and development of the detached, bird's-eye perspective and its connections with state power.

Throughout the book, Kaplan employs the term "aftermath" to describe the consequences of wartime aerial perspectives. Though originally meaning the second mowing or harvest after an initial cutting, Kaplan laments that it has acquired "a figurative [meaning] as 'something' that 'results or follows' from an event that is 'disastrous' or 'unfortunate,' especially in relation to war" (18). While this suggests that her book will pit power against resistance, Kaplan takes pains to ensure the reader that she is after something quite different:

> This book argues that the history of aerial views—whether observed from towers or mountains or hot air balloons or planes, whether incorporated into cartographic surveys or panoramic paintings—troubles this conventional divide between power and resistance in the storyline of visual culture in modernity. I would suggest that we move beyond de Certeau's evocative opposition between "seen and seeing objects" to consider the possible presence of the unseen and unsensed (2–3).