

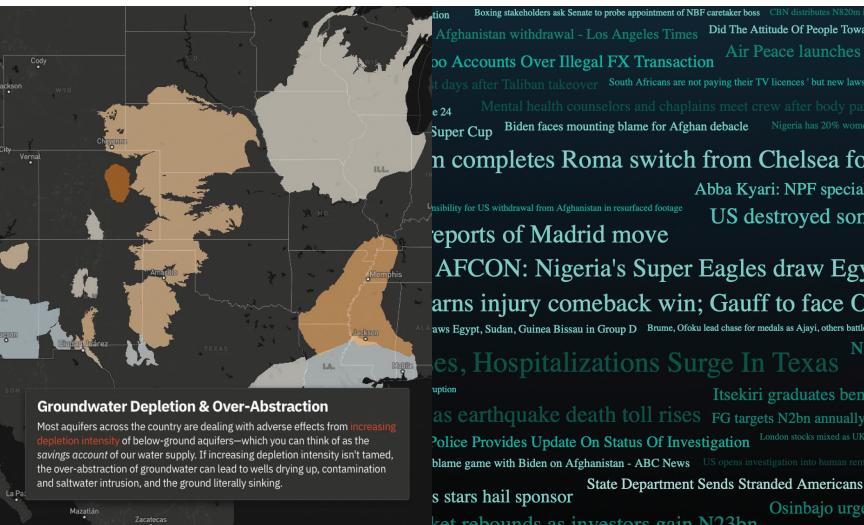


PLACES & SPACES

MAPPING SCIENCE

HARNESSING THE POWER OF DATA

ANNUAL REPORT 2020



Letter from the Curators



Katy Borner



Lisel Record



Todd Theriault

How we appeared to the world during most of 2020.

As for so many around the world, 2020 was a year of challenge and transformation for the *Places & Spaces* community. The global COVID-19 pandemic forced us all to make dramatic alterations to how we live our lives, interact with others, and do our work. It also provoked a fruitful reexamination of how to best fulfill the exhibit's mission of bringing the best examples of science mapping and interactive visualizations to as broad and diverse an audience as possible.

Throughout our 15-year history, this mission has been mainly carried out in libraries, universities, museums, research centers, corporate lobbies, government buildings, and many other physical venues around the world. The exhibit fosters collective learning and collaborative engagement by encouraging visitors to explore the physical maps up close, get hands-on with the macroscopes, and participate with others in workshops and data visualization events.

But in March of 2020, all of that changed. Schools, businesses, and public buildings shut their doors, and most public interactions moved online. At the same time, we watched as data visualization became vital to people's everyday lives, with many relying on COVID-19 maps to inform them of threats to themselves and their loved ones.



Exhibit maps at The Mill in Bloomington, Indiana.

This extraordinary moment in history had produced an unprecedented need for both high-quality data visualizations and the literacy needed to understand them. In response, we engaged in a creative and critical discussion of how we could both carry on the important work of *Places & Spaces* and preserve the health of our exhibit staff, patrons, and contributors.

In order to meet people where they were, we decided to increase our online presence by adding vital COVID-19 visualizations to our website, expanding the scope of our online courses, and creating a virtual map and macroscope tour to present at conferences and workshops. Towards the end of the year, we initiated a major overhaul and expansion of scimaps.org (to be completed by the end of 2021), and utilized the ubiquitous Zoom technology to launch a series of monthly interviews with map and macroscope creators. In November, we were even able to give the exhibit's 16th iteration of

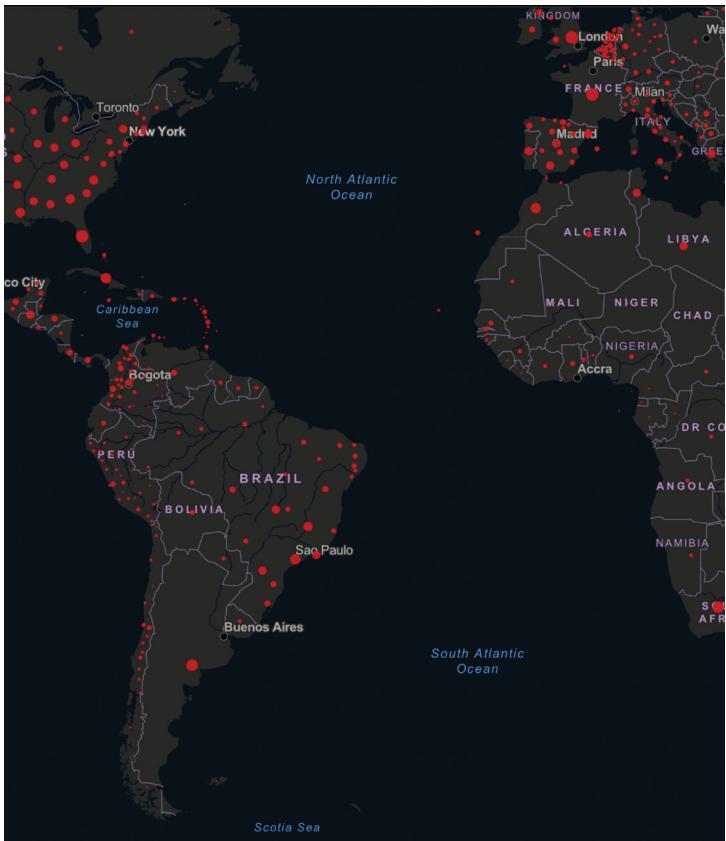
macrosopes a proper debut celebration in an amazing part-physical/part-virtual setting at The Mill, a nonprofit center for coworking and entrepreneurship in Bloomington, Indiana.

You'll hear more about these exciting developments in the pages that follow. But for now, we want to thank our talented exhibit team. Through a combination of prudent fiscal management and remarkable staff versatility, we were able to retain full employment during this year of economic uncertainty. We would also like to thank our Advisory Board and Exhibit Ambassadors for their expertise, enthusiasm, and steady guidance through tough times. Finally, our deep appreciation goes out to the patrons and friends of *Places & Spaces*—many of whom have supported us for years and others who have just discovered us online or through social media. Hopefully, we can meet with you in person again sometime in the very near future!



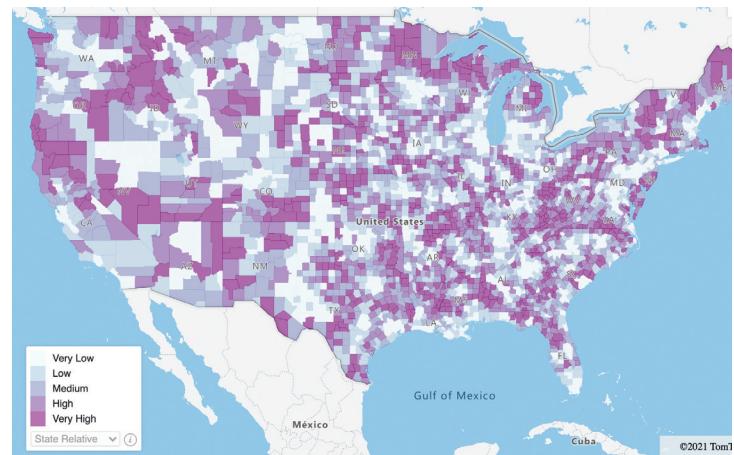
Curator Lisel Record and exhibit assistant Linnea Holt unpack maps for the 16th Iteration debut event in the IU warehouse.

COVID-19 Visualizations

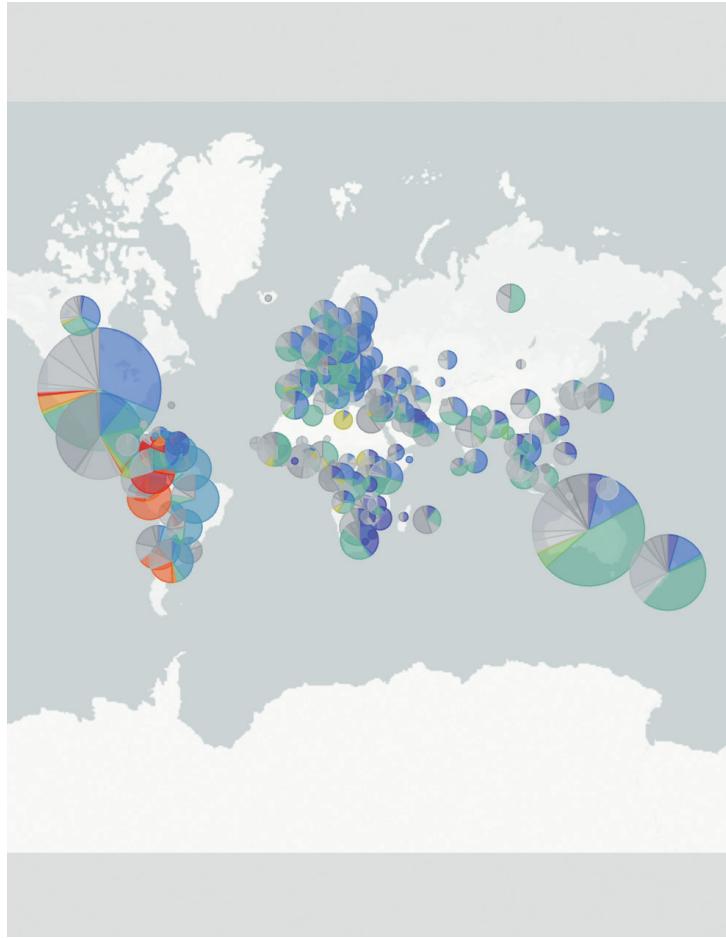


COVID-19 Dashboard, Johns Hopkins

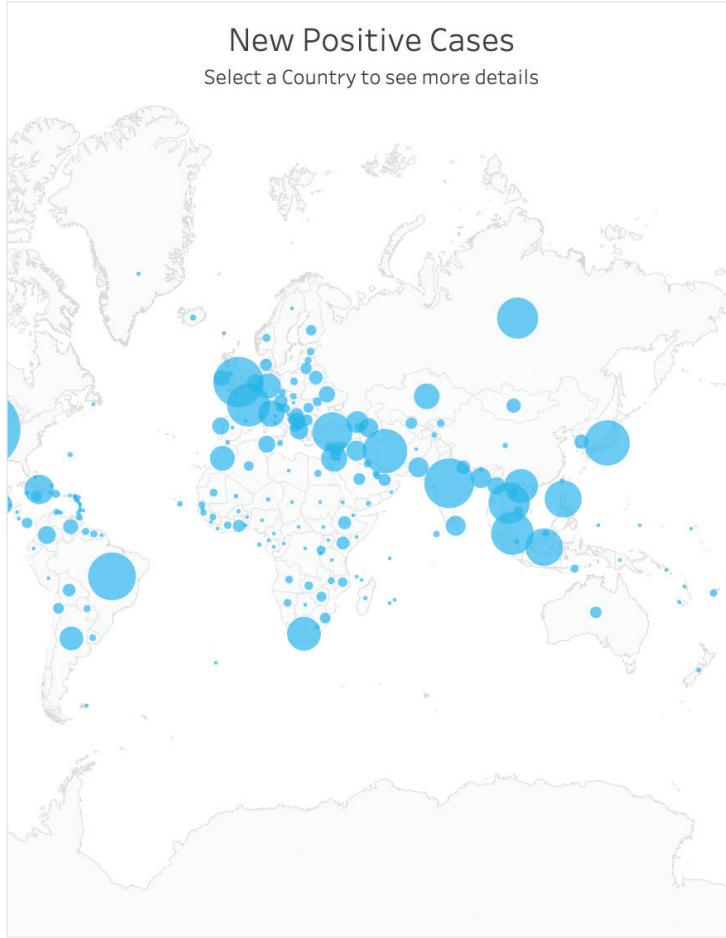
Data visualizations took center stage in 2020 as we all struggled to make sense of COVID-19's local and global impact. The diversity of maps, graphs, and dashboards appearing in those early months was truly impressive, and we wanted to capture this moment when so many responded to the need for accurate, readable data visualizations with such creative energy and data intelligence. For visitors to our website, we collected 10 of the most effective COVID-19 visualizations, along with a few older maps from the Places & Spaces exhibit that took on new relevance. We also included a list of data sources in case visitors were inspired to create their own COVID-19 visualization using this high-quality data.



Community Vulnerability Map, Jvion



Genomic Epidemiology of Novel Coronavirus—Global Subsampling, Nextstrain



Global COVID-19 Tracker, Tableau

2020 Macroscopes



Exploring the macroscopes and staying safe.

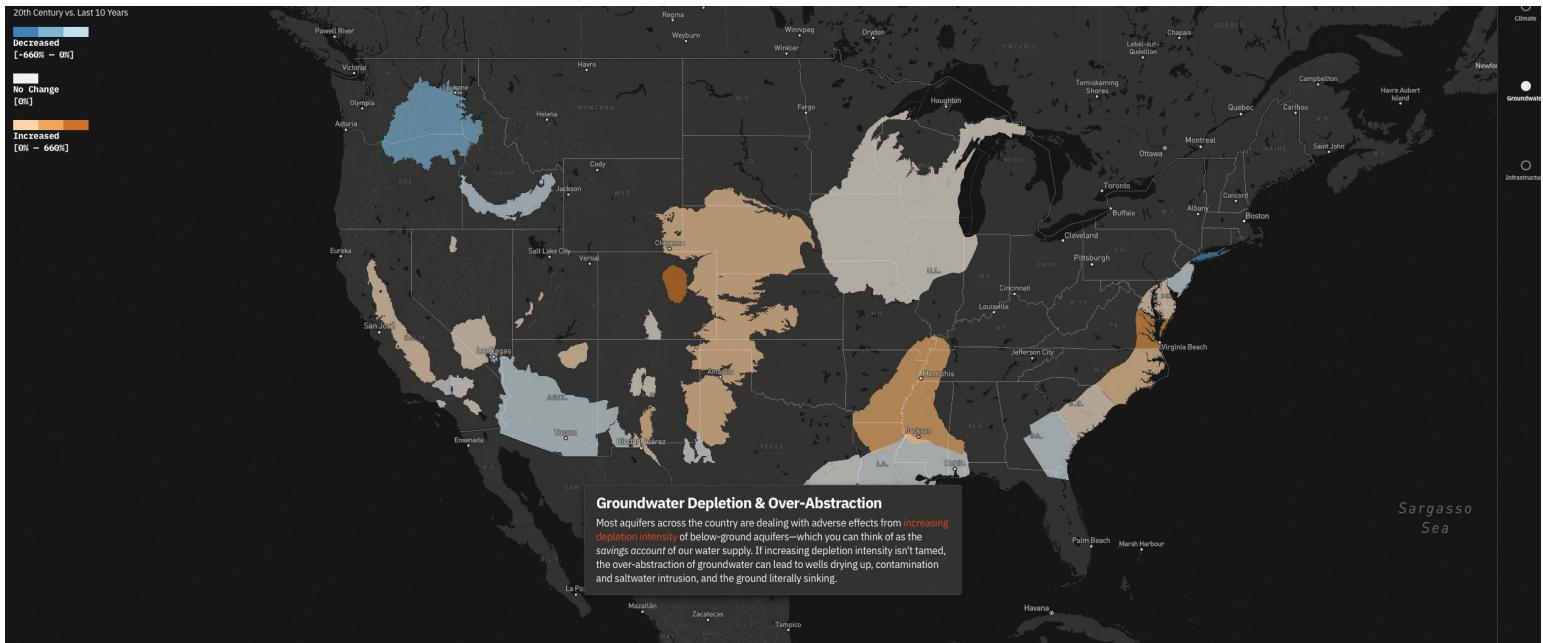
Introduction

The *Places & Spaces: Mapping Science* exhibit, which operates as an outreach activity of the Cyberinfrastructure for Network Science Center (CNS), arises from CNS's core belief that the ability to make sense of data is as critical as the ability to read and write. Tools to assist people in this endeavor are continually evolving, and this progress is evident in the quality of interactive data visualizations being developed today.

The world is a complex place, and we need effective tools to help us understand and manage that complexity. Macroscopes are software tools that help people focus on trends and patterns in data that are too large or complex to see unaided. Interactive by nature, these powerful lenses can be used to detect actionable information in large volumes of data.

Iteration 16: Macroscopes for Harnessing the Power of Data

Macroscopes gather vast amounts of information, process it, and visualize it in ways that bring clarity out of complexity. To deal effectively with data on this scale, they must maximize the capabilities of powerful data tools. Each microscope in this iteration uses different computational analysis and visualization algorithms—natural language processing, network analysis, dimensionality reduction, and “scrollytelling”—to create data portals of great power, utility, and beauty.



The United States Water Crisis

“Scrollytelling,” a mashup of “scrolling” and “storytelling,” is a web-design strategy for telling longform, context-rich stories in a compelling and highly interactive format. The effectiveness of this approach is demonstrated in Andrew Levinson’s *The United States Water Crisis*. Drawing on data from the United States Geological Survey (USGS), the Environmental Protection Agency (EPA), the US Department of Agriculture (USDA), and other agencies, Levinson’s work lays out the underlying causes and wide-ranging effects of this national emergency. The *Water Crisis* macroscope utilizes time-series

graphs, choropleth maps, and other visualization techniques to present the issue from a number of angles. At strategic moments in the narrative, different data points are plotted onto a repeated reference system to convey the increasing seriousness of the problem over time and space. Thus, the macroscope is able to build its case, quite literally, layer by layer. In the end, however, the *United State Water Crisis* opens up a space for hope and issues a strong call to action, concluding with an interactive graph that dramatically illustrates the cumulative effect of individual conservation efforts.

ures Order Freezing Risevest, Bamboo Accounts Over Illegal FX Transaction Air Peace launches flight operations to Ibadan

IN reporter shows scene in Kabul streets just days after Taliban takeover South Africans are not paying their TV licences but new laws could change that

embassy staff as Taliban claim fall of Kandahar - France 24 Mental health counselors and chaplains meet crew after body parts found in landing gear during Air Force flight from Kabul: Report

scores twice as Bayern beat Dortmund in Super Cup Biden faces mounting blame for Afghan debacle Nigeria has 20% women in executive level Report

government Abraham completes Roma switch from Chelsea for 40 million euros MTN appoints new group executive

god's memo stock trading restrictions Watch: Trump claims responsibility for US withdrawal from Afghanistan in resurfaced footage

All part of D'Tigers, says NBBF Abba Kyari: NPF special investigation panel yet to submit report, says police

y's 'Shang-Chi' flare-up on social media a 'misunderstanding' US destroyed some Afghans' passports as they prepared to evacuate Stocks drop, US dollar rises

Brand Identity Halep earns injury comeback win; Gauff to face Osaka Give forex to genuine manufacturers, ASCSN tells FG

es of US exit from Saigon? - France 24 Nigeria draws Egypt, Sudan, Guinea Bissau in Group D Falling naira: NCRIB urges airlines to patronise

tive For Covid As Cases, Hospitalizations Surge In Texas Brume, Ofoku lead chase for medals as Ajayi, others battle for 4x400m mixed relay gold

Curro records strong learner growth despite Covid-19 disruption Nigeria, others not ready for sustainable aviation fuel Expert

umpers Haiti rescue efforts as earthquake death toll rises Itsekiri graduates bemoan casualisation by Chevron, threaten shutdown Yam farmer

Abba Kyari: Police Provides Update On Status Of Investigation FG targets N2bn annually from Ogun farm estate 9 things to know about the Taliban, the new leaders

Republicans play blame game with Biden on Afghanistan - ABC News US opens investigation into human remains found in wheel well of plane that departed Kabul

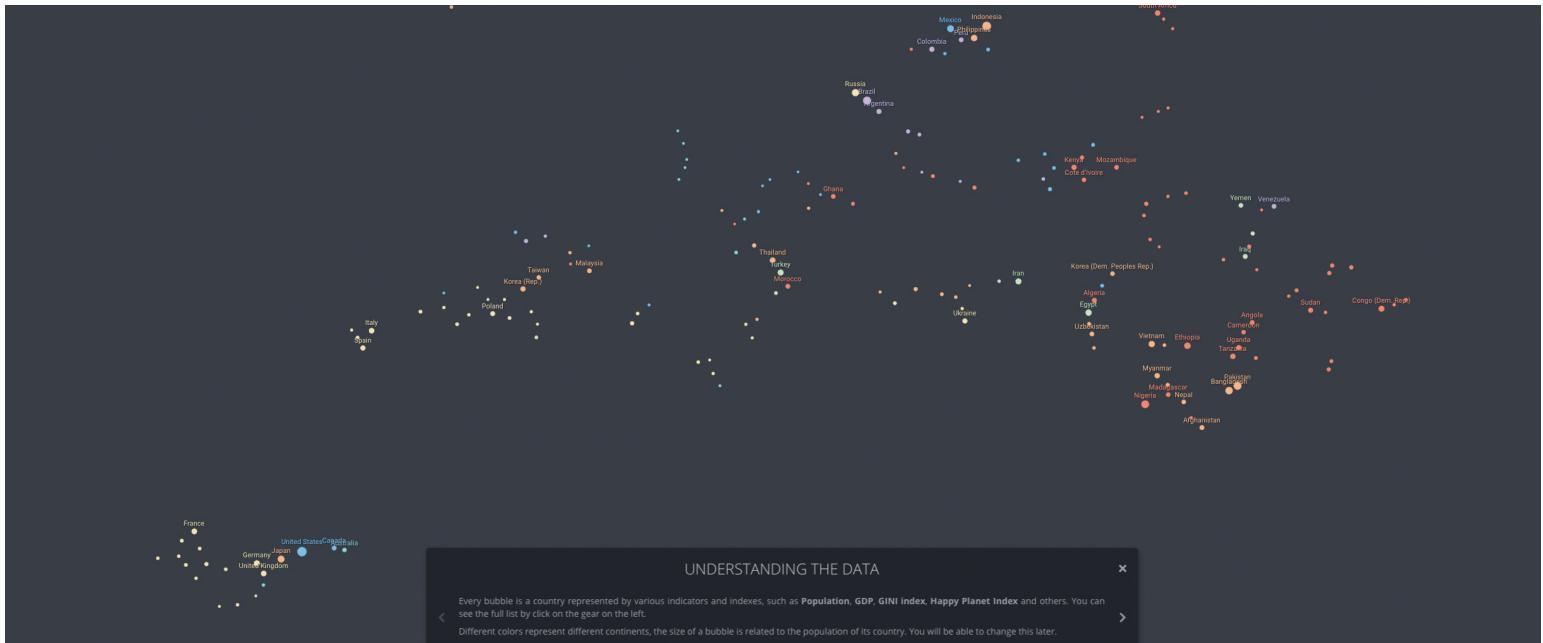
ally 35% full State Department Sends Stranded Americans Note Saying U.S. 'Cannot Guarantee Your Security' En Route to Kabul Air

players get overseas scholarship as stars hail sponsor Osinbajo urges AFREXIM to support FGs MSME programme Facebook exten

The IBM Watson News Explorer

Created by Steven Ross, Timothy Stutts, Megan Monroe, and Mauro Martino of IBM's Visual AI Lab, this interactive news information network captures the fundamental interconnectedness of the news we consume. Utilizing the IBM Watson's Alchemy News API, the *News Explorer* uses natural-language processing to convert the unstructured text of over 250,000 news articles into a searchable network of persons, places, entities, and concepts. Topics can be explored through any of four interlinked visualizations: a map of relevant locations, a timeline of the news, a word cloud of related

concepts, and a network of articles, companies, organizations, and people. Performing combined searches for separate keywords through the *Explorer's* connections feature will generate a network that reveals the often-surprising links that bring together seemingly remote entities. Since its creation in 2016, the *IBM Watson News Explorer* has handled over 2 million unique queries and has received the esteemed Kantar Information is Beautiful Award.



An Alternative Data-Driven Country Map

The desire to visualize relationships between countries takes us back to the very origins of mapmaking when understanding spatial relations was essential for navigation. Today's macroscopes, however, are able to chart international relationships based on multiple variables. *An Alternative Data-Driven Country Map* reimagines the layout of the world by clustering countries together based on multiple indicators, such as health costs, unemployment rates, corruption, tax burden, GINI index, and others. The *Country Map* is able to handle these multi-variable data points by utilizing t-distributed Stochastic

Neighbor Embedding (t-SNE), a powerful machine-learning algorithm for visualizing high-dimensional data. Users of this macroscope can explore the indicators that cause certain countries to group together. But they can also experiment by manipulating a country's variables (raising the GDP or lowering the level of corruption, for instance) to discover how life can be improved and new arrangements can be imagined. Created by Nikita Rokotyan, Olya Stukova, and Dasha Kolmakova of Interacta studio, this work was awarded the World Data Visualization Grand Prize for 2019.



Nature 150

What does the trajectory of scientific thought look like when viewed over a 150-year span? Which scientific fields have gone from fertile valleys to intellectual ghost towns during that time? Have trends in scientific research skewed more towards narrower specialization or broader range? These questions and many others can be explored in *Nature 150*, an interactive map of the venerable journal's publications since its founding in 1869. Created by current and former members of the Barabási Lab at Northeastern University, *Nature 150* visualizes the journal's publication history as

a co-citation network. Here, each article is a node, color-coded by scientific discipline. Two publication nodes are connected if a third paper cites them both. The advantage of this approach is a clear and colorful delineation of how scientific works spread influence both within and beyond their disciplinary boundaries. Indeed, a key finding of this network analysis is that the strength of such boundaries has weakened considerably over *Nature*'s history, with articles today drawing upon and directly inspiring a wider array of scientific fields than ever before.

Venues and Events

Before the World Closed Down

Prior to the “stay at home” order issued in the U.S. in mid-March, *Places & Spaces* was featured at two very important events. In January, the exhibit travelled to Waseda University in Tokyo for NetSci 2020, where Katy Börner served as keynote speaker on day one of the conference, presenting on the topic of “Network Models and Visualizations of Education, Scientific, and Job Market Developments.” That evening, NetSci participants enjoyed the Mapping Science digital exhibit in a convivial setting at the conference’s main reception.



NetSci 2020 at Waseda University in Tokyo, Japan.



Women in Data Science (WIDS) Regional Event in Mexico City, Mexico.

At the beginning of March, the Women in Data Science (WIDS) Regional Event was held on the campus of Universidad Nacional Autónoma de México (UNAM) in Mexico City. The mission of WIDS is to “inspire and educate data scientists around the world, regardless of gender,” and this daylong technical conference featured “outstanding women doing exceptional work” (<https://sg.com.mx/buzz/wids-mexico-city>). Thanks to exhibit ambassador Mariana Espinosa, event attendees were able to view the *Mapping Science* poster exhibit as they gathered in the Carlos Graef Fernández Auditorium. As they often do, the maps of *Places & Spaces* proved a popular attraction and sparked many lively conversations.

Everything's Virtual Now

Mexico City was to be the last physical appearance of *Places & Spaces* for several months. When the shelter at home order was put into effect, we moved our meetings to Zoom and shifted our focus to how we could bring the exhibit to people "where they're at." Since there was already a vast movement of people to online communications, we targeted our efforts in that direction. The ensuing months gave space and time to re-examine the exhibit's virtual presence, leading to a website redesign, virtual tour, and video series that will launch in 2021.



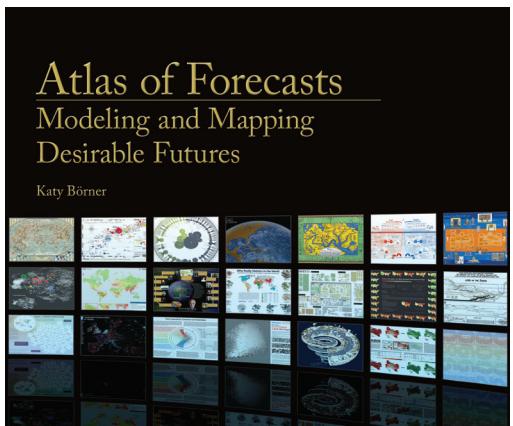
Senior interaction designer Leonard Cross helped develop plans for a thoroughly updated exhibit website. This major effort, to be released in the fall of 2021, will stock scimaps.org with more online content and more interactive experiences than ever before.

We also discussed what we wanted the exhibit experience to look like in this "new normal." Early on, we decided against trying simply to recreate the physical experience in a virtual space. Instead, we wanted to take advantage of technology available to us in an online setting to *augment* the *Places & Spaces* experience. During this time, we developed an exhibit tour that could be presented at online conferences, virtual classrooms, or social media events. The exhibit tour is conducted live by one of our *Mapping Science* experts and includes introductions to exemplary visualizations, key mapping concepts, interviews with map and macroscope makers, live demonstrations of macroscope tools, and time for hands-on experiences and visitor questions.

One of the opportunities that emerged when we began thinking about creating content that could be shared virtually, was a monthly interview series with macroscope makers associated with the exhibit. Curator Todd Theriault met with a collection of macroscope makers to draw out points of interest related to their visualization work. These videos have been edited into short, focused segments so they can be packaged as a video series or individually integrated into presentations and other formats.

Rounding Out the Atlas Trilogy

In many ways, the proudly low-tech, classic print-and-paper book is the perfect companion for our socially distanced times. And even while lockdown was cancelling many of our physical venue plans, we were able to use the extra time to finalize Katy's *Atlas of Forecasts: Modeling and Mapping Desirable Futures*. Consisting now of three volumes, the *Atlas* series has been a powerful vehicle for bringing the *Places & Spaces* exhibit to a wider audience. A work of this size and richness (228 pages, with 400 color illustrations) requires a tremendous effort to push over the finish line. Exhibit staff worked closely with Katy on graphic design, editing, source hunting, copyright acquisition, and more. We will be very excited to hold the final product in our hands when it is published in August of 2021!



The *Atlas of Forecasts* arrives in stores August 2021.



Tracey Theriault, Katy Börner, and Perla Brown review page proofs for the *Atlas of Forecasts*.

Exhibit Advisors

The Indiana University exhibit team benefits greatly from the expert input it receives from this international advisory board. Advisory board members review exhibition submissions and provide their expertise and guidance to the exhibit on many levels.



Gary Berg-Cross is a cognitive psychologist (PhD, SUNY-Stony Brook) who has taught at a number of institutions over his career (SUNY, Widener, University of Delaware, George Washington, George Mason University, and others). For eight years, he served as the Spatial Ontology Community of Practice (SOCOP) Executive Secretariat helping to run workshops and vocabulary development efforts to advance the field. Currently, Berg-Cross serves as a consulting knowledge engineer on earth science projects and is co-organizer of the annual Ontology Summit hosted at NSF and NIST. [Potomac, MD, USA]



Donna J. Cox is the first Michael Aiken Chair, director of the Advanced Visualization Laboratory (AVL) at the National Center for Supercomputing Applications, and director of the Illinois eDream Institute, all at the University of Illinois at Urbana-Champaign. She is a recognized pioneer in Renaissance Teams and supercomputer visualizations for public outreach, and in 2006 she was selected by the Chicago Museum of Science as one of 40 modern-day Leonardo da Vincis. [Urbana-Champaign, IL, USA]



Bonnie DeVarco writes and lectures on design science, virtual worlds, next-generation geographic information systems, information visualization, and the culture of cyberspace. Previously, DeVarco was a Distinguished Visiting Scholar with the Media X Research Network at Stanford University (2009-2012) and served as chief archivist for the Buckminster Fuller Archives. Currently, DeVarco is completing a book on Buckminster Fuller and is coauthor with Eileen Clegg of *Shape of Thought*, on the history and evolution of visual language. [Palo Alto, CA, USA]



Ingo Günther has tried to cross-infuse journalism and art even before he founded the first independent TV station in Eastern Europe (Leipzig's Channel X) in 1989. That same year he began the Worldprocessor project, which has resulted in well over 1,000 modified thematic globes that not only reside in museum collections but have also graced the covers and pages of political magazines (Foresight, Harper's). His works have appeared in museums all over the world, including the Nationalgalerie Berlin, the Guggenheim Museum, Kunsthalle Düsseldorf, Espacio Buenos Aires, Iwaki City Art Museum, Somerset House in London, Hood Museum at Dartmouth, and the MIT Museum. [Karlsruhe, Germany]



Francis Harvey is head of the Department of Cartography and Visual Communication at the Leibniz Institute for Regional Geography and professor of Visual Communication in Geography at the University of Leipzig, Germany. His research and teaching activities center around geographic information systems (GIS), particularly their technologies, applications, ethical dimensions, and societal implications. Harvey's *Primer of GIS: Fundamental Geographic and Cartographic Concepts* (Guilford, 2015) is now in its second edition. [Leipzig, Germany]



Peter A. Hook is an associate law librarian at the University of Notre Dame Law School. He received his doctorate from the Luddy School of Informatics, Computing, and Engineering at Indiana University where his primary research focus was information visualization, particularly the visualization of knowledge organization systems, concept mapping, and the spatial navigation of bibliographic data in which the underlying structural organization of the domain is conveyed to the user. [South Bend, IN, USA]



Lev Manovich is professor at the City University of New York (CUNY) Graduate Center and author of several books on digital culture, including *Software Takes Command* (Bloomsbury Academic, 2013). In 2007, Manovich founded the Software Studies Initiative in order to develop a new paradigm of Cultural Analytics through data analysis and interactive visualization of patterns and trends in media and visual cultures. [New York, NY, USA]



Elijah Meeks is the executive director of the Data Visualization Society and a data visualization engineer at Apple. His prior experience includes working in the digital humanities at Stanford and developing data visualization applications at Netflix. He is the author of D3.js in Action, the data visualization library Semiotic, and various essays on the subject of modern professional data visualization. His work includes the development of data visualization libraries, tools and exploratory applications. [Los Gatos, CA, USA]



André Skupin, professor of geography at San Diego State University, is interested in the application of geographic metaphors, cartographic principles, and computational methods to the visualization of non-geographic information. His research is interdisciplinary, aimed at increased cross-fertilization between geography, information science, and computer science. Recent work includes novel methods for visualizing human movement and demographic change as trajectories in n-dimensional attribute space. [San Diego, CA, USA]



Olga Subirós is an architect, exhibition designer, and founder of Olga Subirós Studios. Recently, she co-curated (with José Luis de Vicente) Big Bang Data, a major exhibition of data-driven artworks and objects that provide crucial insight into the world of big data. Since 2014, the exhibit has toured worldwide, appearing at the Centre de Cultura Contemporánea de Barcelona (CCCB), Fundación Telefónica in Madrid, Somerset House London, ArtScience Museum Singapore, Centro de Cultura Digital in Mexico, and the DOX Centre for Contemporary Art in Prague. [Barcelona, Spain]



Stephen Uzzo is vice president of science and technology for the New York Hall of Science where he works on exhibit and program development projects related to STEM learning, scientific visualization, sustainability, and network science. Uzzo also serves on the faculty of the New York Institute of Technology Graduate School of Education, where he teaches STEM teaching and learning. [Queens, NY, USA]



Benjamin Wiederkehr is founding partner and managing director of the Zürich-based design and data visualization studio, Interactive Things. He is also part of the Open Government Data task force in Switzerland and helps to facilitate open access to government data for everyone. On [Datavisualization.ch](#), Wiederkehr provides insight into his research and working process and documents topical use cases in the field of data visualization. [Zürich, Switzerland]

The 16th Iteration Makes Its Debut

After such a challenging year, it was particularly gratifying to give the 16th Iteration a debut that was a little bit more like old times. In October, the Mill, a nonprofit center for entrepreneurship in Bloomington, Indiana, held Ada Lovelace Day, an event celebrating the achievements of women in science, technology, engineering, and math (STEM). *Places & Spaces* was proud to feature several exhibit maps produced by talented women in the fields of engineering, computer science, mathematics, medicine, design, and others. Health precautions made bringing the macroscope touch-panel kiosk to the event an impossibility. However, we developed a system to allow guests to scan a QR code and access the macrosopes on their personal devices. Although the debut was definitely not business as usual, it was an absolute pleasure to see the maps back on display, enjoy talks by curators Katy Börner and Lisel Record, and be present as people interacted with the exhibit's new macrosopes for the very first time.



A socially distanced 16th Iteration debut!



Exhibit maps featuring work by women scientists, researchers, and artists.

Host the Exhibit

Put your institution on the map by hosting *Places & Spaces*. The exhibit consists of 100 framed, high-resolution maps, and 24 interactive macrosopes that travel on a touchscreen kiosk. Ingo Günther's *WorldProcessor Globes*, hands-on science maps for kids, the Illuminated Diagram, and the award-winning film *Humanexus* are also included. Give your audience the chance to play with data and make sense of science and technology developments.

The *Places & Spaces* exhibit travels in a variety of formats to fit every space and budget. Explore our all-digital options, purchase individual maps, or purchase a poster version of the exhibit. Our digital display is a high-resolution slideshow of 100 exhibit maps, optimized for showing the full breadth of the exhibit on one screen. The majority of our exhibit maps are also available for individual purchase or as an archival set. All maps are 24" x 30" (61 x 76 cm) and can be ordered as inkjet prints, high-quality archival prints, and framed prints. Visit our website to explore the many ways you can bring the exhibit to your space (scimaps.org).



Ingo Günther's *WorldProcessor Globes*.



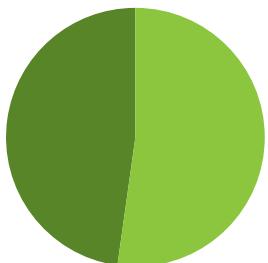
The high-definition touchscreen microscope kiosk.

Exhibit in Numbers

Finances

Exhibit finances are managed by the Cyberinfrastructure for Network Science Center at the Luddy School of Informatics, Computing, and Engineering at Indiana University. Shown below are exhibit expenditures for January 1-December 31, 2020.

2020 EXPENSES

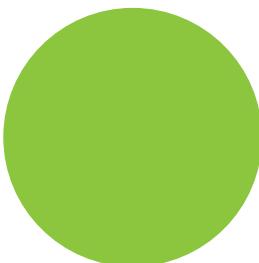


Compensation \$1,865.82

Travel \$0

Supplies and Expenses \$1,697.57

2020 INCOME



CNS Support \$ 3,563.39

Map Sales and Venue Revenue \$0

100

MAPS

in large format, full color, and high resolution.

215

MAPMAKERS

from fields as disparate as art, urban planning, engineering, and the history of science.

60



MACROSCOPE MAKERS

including one whose job title is "Truth and Beauty Operator."

24

MACROSCOPES

for touching all kinds of data.

401

DISPLAY VENUES

from the Cannes Film Festival to the World Economic Forum.

222



PRESS ITEMS

including articles in *Nature*, *Science*, *USA Today*, and *Wired*.

38



WORKSHOPS ORGANIZED

6,626,774

WEBSITE VISITS

Resources

Books and Essays

Börner, Katy. 2010. *Atlas of Science: Visualizing What We Know*. Cambridge, MA: The MIT Press. (mitpress.mit.edu/books/atlas-science)

Börner, Katy. 2015. *Atlas of Knowledge: Anyone Can Map*. Cambridge, MA: The MIT Press. (mitpress.mit.edu/books/atlas-knowledge)

Börner, Katy. 2021. *Atlas of Forecasts: Modeling and Mapping Desirable Futures*. Cambridge, MA: The MIT Press.

Börner, Katy. 2020. "Modeling and Envisioning Complex Systems." Winter issue on Complex Unifiable Systems, *The Bridge* 50 (4): 19-20.

Börner, Katy, Andreas Bueckle, and Michael Ginda. 2019. "Data Visualization Literacy: Definitions, Conceptual Frameworks, Exercises, and Assessments." *PNAS* 116 (6): 1857-1864. doi: 10.1073/pnas.1807180116.

Börner, Katy, and David E. Polley. 2014. *Visual Insights: A Practical Guide to Making Sense of Data*. Cambridge, MA: The MIT Press.

Börner, Katy, and Adam Maltese, Russell Nelson Balliet, and Joe Heimlich. 2015. "Investigating Aspects of Data Visualization Literacy Using 20 Information Visualizations and 273 Science Museum Visitors." *Information Visualization* 15 (3): 198-213.

Boyack, Kevin W., and Katy Börner, eds. 2014. "Mapping Science." Special issue, *Bulletin of the Association for Information Science and Technology* 41 (2).

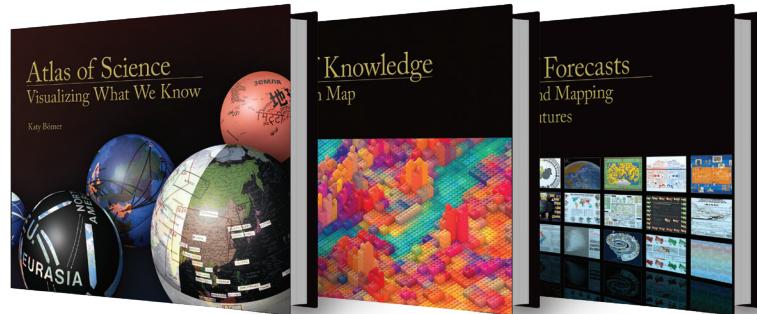
Scharnhorst, Andrea, Katy Börner, and Peter van den Besselaar, eds. 2012. *Models of Science Dynamics: Encounters Between Complexity Theory and Information Sciences*. Berlin: Springer-Verlag.

Shiffrin, Richard M., and Katy Börner, eds. 2004. "Mapping Knowledge Domains." Special issue, *PNAS* 101 (Suppl. 1).

YouTube. CNS Channel. (www.youtube.com/user/CNSCenter)

YouTube. HubMAP Consortium Channel. (tinyurl.com/y95t8ux9)

YouTube. NAS Colloquia Channel. (www.youtube.com/user/SacklerColloquia)



Tools

Science of Science (Sci2) Tool (sci2.cns.iu.edu) is a desktop application that was specifically designed for the study of science. It supports the temporal, geospatial, topical, and network analysis and visualization of data sets at the micro (individual), meso (local), and macro (global) levels.

Courses

The Information Visualization Massive Open Online Course (IVMOOC) (ivmooc.cns.iu.edu) provides an overview of the state of the art in information visualization. It teaches visualization theory and the process of producing effective and actionable visualizations that take the needs of users into account.

The Visual Analytics Certificate (VAC) (visanalytics.cns.iu.edu) course provides an overview about the state of the art in information visualization. It teaches the process of producing effective visualizations that take the needs of users into account.

The Visible Human Massive Open Online Course (VHMOOC) (tinyurl.com/y5dzrkr4) presents an overview of tissue data acquisition and analysis, demonstrates single-cell analysis and CCF mapping techniques, and introduces major features of the Human BioMolecular Atlas Project (HuBMAP) portal.



Places & Spaces: Mapping Science

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James S. McDonnell Foundation



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