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MAPS: THE DEEPLY HUMAN URGE FOR DIRECTION

For millennia, humans have made maps—locations of phenomena that vary between here and there. Maps offer the unique perspective of context . . . the place of focus and the area around it, whether the school grounds within the neighborhood, the state in the country, or the region and the planet. Maps let users focus on a few key elements of content within a sea of complex surroundings, abstracting the infinite details down to a manageable few. Even a "simple" map of the last block on a student's path to school may feature sets of structures, roads, sidewalks, trees, fences, parking and driving areas, bus stops, lights, animals, and outdoor furniture. Each set could make up a "layer," which the user could mentally add or remove to highlight conditions, patterns, and relationships.

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We don't yet know what a honeybee "sees" in its head while watching another bee waggle-dance to show the distance and direction to good flowers, nor whether the Arctic tern "thinks" a map when traveling between the Arctic and Antarctic, nor whether whales and sharks navigating vast oceans "plan" their path; we can only marvel at their capacities. In our own species, making maps has helped us think abstractly, and by doing so, plan.

Map users have long been analytical, mentally adding or subtracting details, and seeking connections, explanations, and tallies. How many people, where are the villages, what is the terrain like, will it be easier to take the slightly longer but gentler path? People use maps to study the present, comprehend the past, and prepare for or even change the future. The human brain is a powerful system for storing, visualizing, and analyzing geographic information.

In the 21st century, we have bold new powers for observation, limitless storage for data, and fast mechanical brains for highlighting features on the landscape . . . and in the air, and the waters, and the buildings, and underground . . . today, last year, next week. Geographic information systems—an integrated system made up of hardware, software, data, methods, and ourselves as thinking explorers—open up the planet for exploration, the community for investigation, the world large and small for observation, documentation, analysis, interpretation, and action. Today, users on a laptop, tablet, or even smartphone, can connect wirelessly to nearly infinite storehouses of information, which can be sifted, styled, combined, analyzed, interpreted, saved, and presented, with a speed and capacity unimaginable just a generation ago.

As never before, we can study and understand our world, or at least describe it. We can see all manner of conditions and conduct, and now recognize staggering challenges, much of it of

our own making: exploding population; climate change; environmental degradation and loss of biodiversity; pollution of air, land, and water; insecurity of food, clean air, and clear water; threats to personal health and safety; political unrest within and between nations; disruptions of established systems of society and economy; and on and on.

But, by working with maps, investigating data, seeking the patterns, and finding the relationships, across all parts of our existence, you the user can build understanding. You can shine a light on conditions and discover connections. From patterns and models come ideas for alternatives—plans and solutions, visions and strategies. Whether high schoolers designing pedestrian-friendly and energy-smart communities, or middle schoolers crafting

alternatives for flood-prone neighborhoods, or elementary schools mapping acts of kindness, students can come to grips with these challenges and even change the world.

In the process, you can construct technical skills useful in countless industries and careers; gain literacy in data creation, analysis, presentation, and consumption; and develop critical thinking skills and problem-solving patterns useful across college, career, and community life. And have fun doing it. Yes, making maps can be personal, creative, puzzle solving, or community supporting, or all these. But, most importantly, you can begin to see what others can't, illuminate the connection, point the way, design the plan, and make the world a better place.
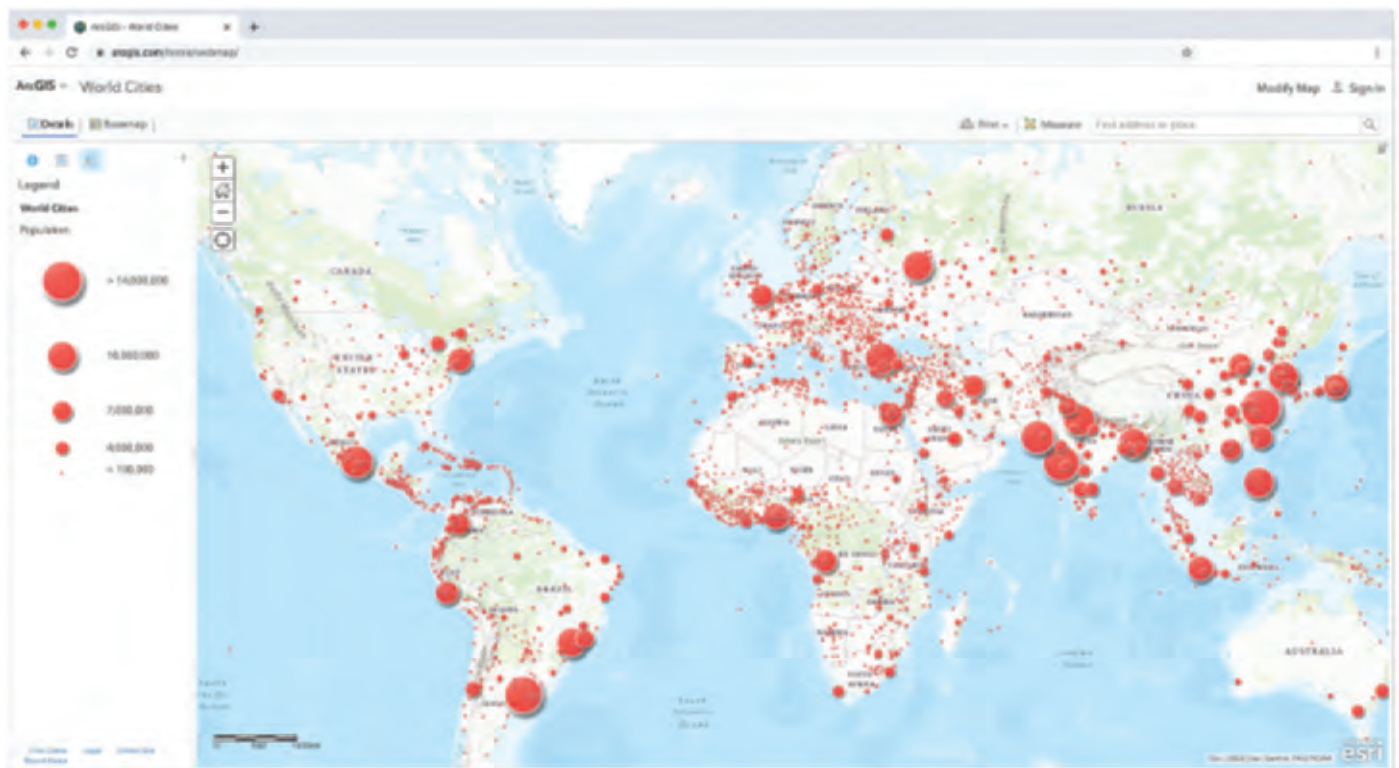
So what's a map layer? Layers are the mechanism used to display geographic datasets. Each layer references a dataset and specifies how that dataset is portrayed using symbols and text labels. So when you add a layer to a map, you specify its dataset and set its map symbols and labeling properties. The world cities layer of this Esri map provides a basemap layer of the cities for the world, including national capitals, provincial capitals, major population centers, and landmark cities.