

*Months to Less Than Five Weeks!*

## ***National Geographic* Makes Maps More Timely Than Ever With GIS**

Following the terrorist attacks on the United States on September 11, 2001, millions of Americans searched for some way to help out. Emergency personnel from all over the country made their way to New York and Washington, D.C., to assist. Many flew flags and displayed patriotic bumper stickers in a show of national solidarity.

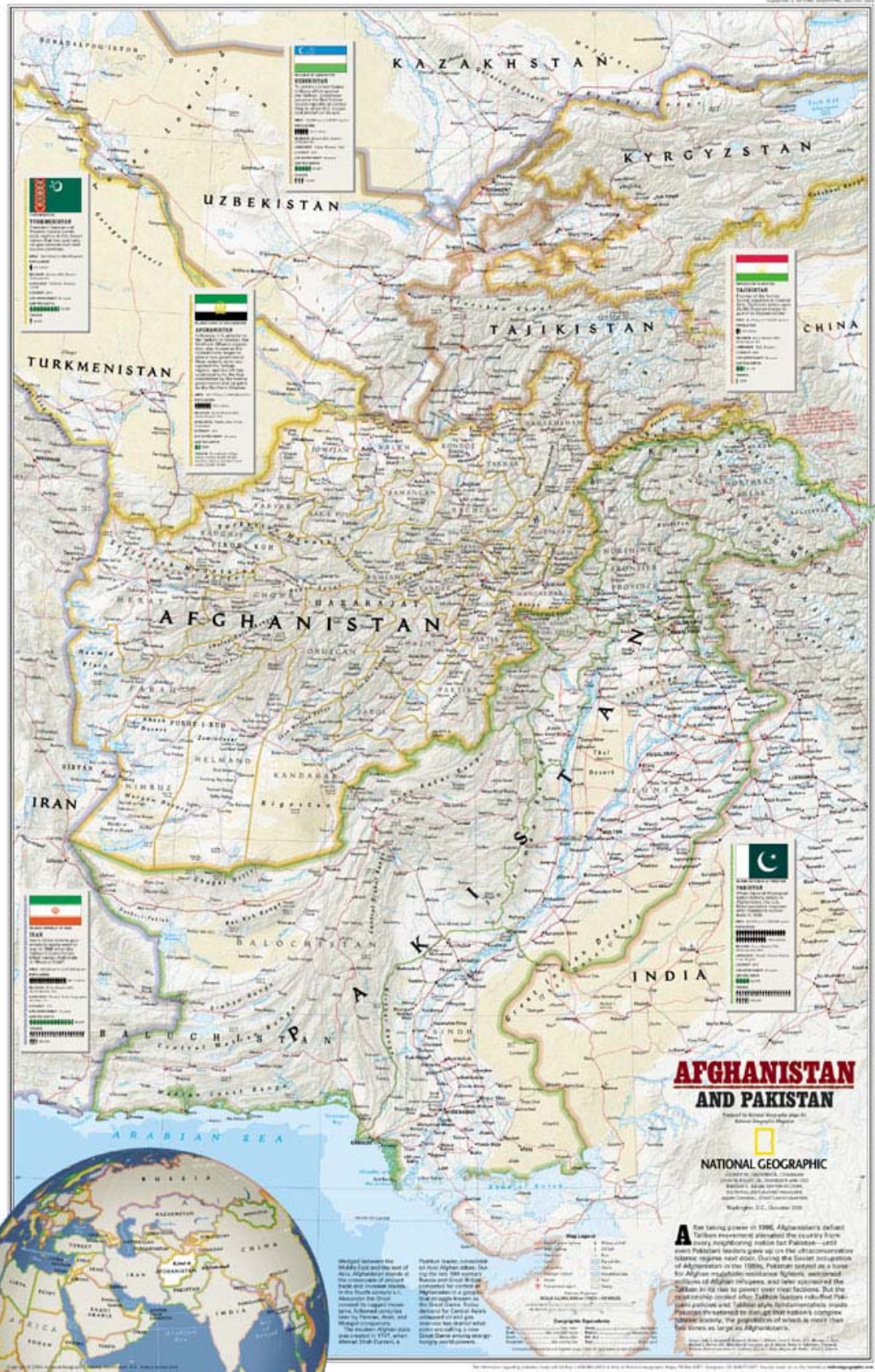
At the offices of *National Geographic*, the map division felt it was in a unique position to help Americans understand the events in the news and the geography behind them. World attention was soon directed at Afghanistan and its ruling Taliban regime. Even before the United States began its air campaign in Afghanistan in October of 2001, National Geographic Maps had committed itself to produce a high-quality, detailed map of Afghanistan and the surrounding region for its December 2001 issue.

Normally a map supplement is on the magazine's produmost recipients of the December issue didn't realize was that *National Geographic* had committed itself to a production time line of less than five weeks to include the Afghanistan map in the issue. And, according to the map division, it wouldn't have been possible without its GIS staff.

### **Response to September 11**

"When the planes struck the World Trade Center, everyone was sort of in shock," says Allen Carroll, chief cartographer at National Geographic Maps. "That weekend I realized that we needed to respond in some way. We were 95 percent finished on a map of Antarctica, but first thing Monday morning I went to see Bill Allen, the editor of the magazine. I said 'Let's put the Antarctica map on the shelf and work day and night to produce an Afghanistan map.' Once we had him convinced that we could do it, and I was confident we could, he said 'Let's go ahead and do it.'"

Because the magazine is known for its high-quality production and prints millions of copies, it can take up to six weeks to print an issue. "We're constantly doing press pulls during the printing, checking and changing things," says Jan Morris, GIS project manager at National Geographic Maps. Therefore, the map supplement would have to be completed by mid-October.



*GIS was instrumental in helping create this map in less than five weeks rather than the usual six months.*

Straddling between the Middle East and the rest of Asia, Afghanistan stands at the crossroads of ancient trade and invasion routes. In the fourth century B.C., Alexander the Great invaded to exploit resources, followed centuries later by Persians, Arabs, and Mongol conquerors. The modern Afghan state was created in 1919, when Afghan Shah Zahir Shah...

**A**fter taking power in 1996, Afghanistan's de facto Taliban movement alienated the country from every neighboring nation but Pakistan—and even Pakistani leaders gave up on the ultraconservative Islamic regime next door. During the Soviet occupation of Afghanistan in the 1980s, Pakistan served as a base for Afghan mujahideen resistance fighters, welcomed millions of Afghan refugees, and later sponsored the Taliban as it rose to power over rival factions. But the peacekeeping coalition after Taliban leaders refused Pakistan's proposal to allow Afghan disarmament, made Pakistan the battleground to fight that nation's complex tribal society, the population of which is more than ten times as large as Afghanistan's.

**AFGHANISTAN AND PAKISTAN**  
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“That was the first time we’d ever done anything like this, and it was an extraordinary effort,” says Morris. “I don’t think that we would have even tried to do it without GIS. Because of the unusual time line, we needed to pull data quickly from a variety of sources. I can’t imagine how we could have compiled it in the time we had if all of our sources were on paper, with different projections and different formats. For the topographical map in the supplement, it was the first time that we’ve ever produced a digital, shaded relief model for a supplement-sized map. There just wasn’t time to render it by hand.”

Using ArcGIS, the team members gathered GIS digital data sources from the National Imagery and Mapping Agency (NIMA) and the United States Geological Survey (USGS) and combined them with their own in-house data to prepare initial base files in a common projection. They used automated generalization routines to delete very small polygons and smooth out clustered line details. Customized tools allowed them to quickly generate tint bands, tapered drainage, color specifications for all features, and layered illustrator files. GTOPO30, a digital elevation model resource from USGS, allowed them to render a hillshade by using GRID. NIMA’s online gazetteer allowed them to plot the coordinates and names of towns to begin their type placement.

“Given the dynamic nature of the geographic area we were mapping, we needed to augment the digital information with printed sources and verbal intelligence for greater accuracy,” says Morris. “Without GIS software we never could have completed the project on schedule with comprehensive accuracy.”

Carroll had proposed the Afghanistan map on Monday, September 17, and a completed map was delivered to the printer on Friday, October 19. “It turned out to be a tremendous boost to morale,” says Carroll. “As we were working on it, we felt that we could make a contribution to people’s understanding. It was also a boost to our spirits after the wonderful response that it got from the public, the press, and even from Capitol Hill. People were hungering for information about Afghanistan, and we were able to respond in a timely way.”

### **The Middle East Map**

*National Geographic* seeks to balance coverage of biology, conservation, and traditional anthropology with issues that are in the news. “We are gearing ourselves to be more timely, but there is still a time lag,” says Morris.

Although it does not wish to cover current events in the traditional sense, *National Geographic* realizes that wars and other news items can pique a reader’s interest in the associated geography. This was again demonstrated in the magazine’s October 2002 issue.

“Knowing that the Middle East is still an area of concern and potential activity, we wanted to bring our focus of cartography on the area,” says Carroll. “We had discussed doing a supplement map of the West Bank, but we quickly came to agree that it was too narrow a focus for a large format map.

With Iraq starting to stake a claim to the headlines, I thought we should include a larger area. I remember looking at one of our atlas plates and windowing out an area that included Cairo on the west and Kuwait on the east. If we did a large-scale map of that area, it would give us more detail than we'd ever published on Iraq, but also show it in relation to Israel and the West Bank and put everything in a pretty interesting context. Fortunately, we had a substantially longer timetable than for the Afghanistan map, but it was still more compressed than normal.”

### **A Bit of History**

Mapmaking at *National Geographic* has evolved gradually over the years. “Originally, our maps were hand drawn,” says Carroll. “Later they would be hand scribed and etched onto a series of chemically treated plastic sheets in many, many layers, and all the type was photomechanically set and applied by hand to the maps. To make any sort of significant change was a daunting task. It was possible to add roads or a few names, but if you wanted to change a projection or color, that meant starting over with a new map.”

Morris says that its GIS program got a big boost from working on the seventh edition of the *National Geographic Atlas of the World*. From working on that project, the GIS staff gained a great deal of skill and gathered a large amount of data that could be used for future projects.

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