

# **Section II: National Remote Sensing Programs & Policies**

During the Cold War, the United States and Soviet Union possessed a near monopoly on imaging satellites in both the military and civilian realms. For most of the Cold War years, the superpowers were the only countries with sufficient capabilities to develop, produce, and operate their own constellations of earth-observation satellites. Since the late 1980s, however, there has been a steady growth in the number of countries (and multinational organizations) that have fielded their own civilian remote sensing satellites. These countries include both highly industrialized countries, such as France, Japan, and Canada, and some newly developing countries, such as Israel and India. In addition, other countries, including Australia, Norway, and Singapore, have developed extensive expertise in using satellite and airborne imagery for civilian and commercial remote sensing applications without operating their own imaging satellites.

Section II presents a representative survey of the remote sensing programs of several different countries that highlights their civilian and commercial imaging satellite programs and policies. In addition to offering specific insights on particular national imaging satellite programs, these chapters serve as a reminder that the major source of global transparency is the increasing number of countries, and their commercial enterprises, that are committed to pursuing earth-observation satellite programs.

Kevin O'Connell and Gregory Hilgenberg analyze the U.S. civilian and commercial remote sensing programs and policies in Chapter 7. Their analysis highlights the extensive investment that the U.S. government has made in supporting civilian earth-observation systems since the 1950s, including a continuing series of meteorological satellites and the new Earth Observing System satellites dedicated to studying global change. They examine in some detail the U.S. Landsat program, which produced the world's first civilian remote sensing satellite in 1972 and continues with the launch of Landsat 7 in 1999. O'Connell and Hilgenberg also examine the considerations that led the U.S. government in the mid-1990s to encourage U.S. firms to invest in developing commercial observation satellites and the extensive ground-based infrastructures needed to support these satellites.

George Tahu reminds us in Chapter 8 that Moscow actually led the way in the early 1990s in relaxing Cold War restrictions on satellite imagery by permitting declassified imagery (with resolutions as sharp as 2 m) from Russian military satellites to be sold on the international marketplace. However, in marketing data, Russian enterprises have struggled with a combination of bureaucratic, financial, and technical impediments. Nonetheless, Russian enterprises are exploring new forms of imaging satellites and imagery data sales that could once again set new precedents for marketing in this field.

In assessing the French remote sensing experience in Chapter 9, Isabelle Sourbès-Verger and Xavier Pasco point out that the Satellite Pour l'Observation de la Terre (SPOT) system laboriously built much of the current market for earth-observation data and will continue to be a major market force. They note that Paris and Washington differ in their definitions of the "commercialization" of remote sensing.

Kazuto Suzuki observes in Chapter 10 that Japan's remote sensing program is at a crossroads in making a difficult transition from an orientation toward technology push driven by government agency objectives toward market pull, in which customer requirements are paramount. He also assesses the major change that occurred in the Japanese remote sensing program following the North Korean launch of a Taepodong rocket over the Japan mainland in September 1998. This event galvanized Japanese determination to acquire a series of high-resolution information-gathering satellites for monitoring purposes.

In Chapter 11, Gerald Steinberg analyzes the satellite remote sensing programs of various countries in the Middle East and the Persian Gulf. He gives substantial attention to an examination of Israel's rapidly developing imaging satellite programs, including its ambitious plans to enter the commercial satellite imagery marketplace with a series of high-resolution imaging

satellites. Steinberg also offers an alternative perspective on the benefits and risks of commercial satellite imagery as a force for global transparency. He argues that, at least for countries located in regions where the risk of armed conflict with neighbors is high, such as Israel, the benefits are uncertain at best. Rather, unrestricted access to high-resolution satellite imagery may actually erode national security by impeding the ability of these countries to conceal their vulnerabilities.

A similar ambivalence toward the value of satellite imagery is found in India's remote sensing policy. India's IRS-1C and IRS-1D satellites have gained it a significant presence in the international market for satellite imagery. However, in reviewing the evolution of the Indian remote sensing program in Chapter 12, Deborah Foster notes that high-resolution satellite images also raise difficult data policy and bureaucratic issues for India as its top government officials try to balance the national development benefits associated with selling and acquiring satellite imagery against the potential national security concerns that high-resolution imagery raise.

Canada's RADARSAT program is undergoing major changes as Canadian officials seek to define their national interests in developing the next-generation radar imaging satellite. The analysis of the Canadian remote sensing program that Michel Bourbonniere and Louis Haeck provide in Chapter 13 underscores the international policy challenges associated with moving to the RADARSAT-2 program, which is focused on meeting both civil and commercial remote sensing needs.

The in-depth survey of national remote sensing programs presented in Section II is necessarily less than comprehensive. A more complete inventory of the past, present, and planned land remote sensing satellite systems, as well as their key imaging characteristics, can be found in Appendix B. Given the dynamic nature of these diverse national and commercial remote sensing satellite programs (i.e., program delays, launch failures, new starts, etc.), the reader is encouraged to check the Web site of the American Society for Photogrammetry and Remote Sensing, [www.asprs.org/asprs/news/satellites/](http://www.asprs.org/asprs/news/satellites/), for periodic updates to the data presented in Appendix B of this volume.