

# WHAT HAVE YOU



Before: The border near Basra and Abadan, as viewed from Landsat 2 in 1977. Resolution in this image is 80 meters. Resolution in the other, more recent view of this region is 30 meters. The improvement is due to a more sophisticated sensor, the Thematic Mapper, being added to Landsats 4 and 5.

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by Peter Fend and  
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**D**URING the 1960s and the 1970s, visual artists began moving into film and video as display media and into landscapes and ecosystems as sculptural or architectural material.

Many wanted to deal directly with the conditions of life on Earth, not just to decorate the walls of the elite; many felt that the mass media had become a more effective field of action than museums and galleries. Out of that ferment came Ocean Earth.

The Ocean Earth Construction and Development Corporation was founded in 1980 to undertake projects larger than was possible for any one person and of broad public rather than just art-world service. Our interest in large-scale modification of the Earth soon led us to become experts in the analysis and presentation of satellite imagery. Ocean Earth appears to be the first and only company regularly conducting surveys with civil satellite data of military phenomena.

Further, we seem to be the only company committed to disseminating the results of such surveys to the general public via television and news publications. Others are likely to follow soon, however.

# GOT TO HIDE?



Ocean Earth/Landsat

Careful analysis of civilian-grade Earth observations from orbit can yield information with significant military intelligence value. This was established by our first published project, a Landsat survey of the Falkland Islands just prior to the British invasion in 1982. The British Admiralty requisitioned the material we had sold to the BBC, and we were approached with contract offers by the U.S. Defense Intelligence Agency (DIA). Since that experience, Ocean Earth has steadfastly avoided dealings with belligerent parties in a conflict. We rejected the DIA offer, and the U.S. military went on to develop Landsat analysis programs of its own in all three major branches of the service.

As civilians, without access to official plans or secrets, we have discovered facts in virtually all of the projects conducted so far that gave us insight into actual and potential crisis situations superior to that enjoyed by those relying on more traditional newsgathering techniques. Satellite surveys are particularly useful for understanding conflicts based on resource-control rivalries.

For example, in a preliminary survey of Lebanon early in 1983, we found satellite evidence that suggested Israel had begun diverting water from the Litani River in Lebanon, depriving the residents of the area of a resource essential to their lives. ►

**After:** Landsat view of the same locale, January 20, 1985.

What began as a linear trench grew into a wedge-shaped lake that spilled into meandering extensions that cross into Iran. The Iraqis had to remove some 400 million cubic meters of salt-laden clay to create this water shield. Its primary purpose seems to be to protect Basra from the estimated one million Iranian soldiers massed on the other side of the border. Preparations for additional channels on the Iranian side of the border are visible. These may represent an Iranian attempt to drain the water, or an Iraqi attempt to block Iranian defense of Abadan.

We were unable to find a news bureau willing to sponsor a more detailed investigation because none of the editors we approached thought the issue would be timely or "hot" enough to justify the cost of our research. We believe that the water diversions catalyzed the Shiite unrest in that part of Lebanon, which in turn provoked the bloody Israeli crackdown.

In 1981, the Iraqi government claimed that it had a "secret weapon" in its year-old war with Iran. Speculation about the nature of this weapon centered on Exocet missiles, poison gases, and the like — until we discovered (and reported — see especially our article in the *New Scientist*, January 17, 1985) that the weapon is a massive water project in the salt flats east of Basra.

Landsat images of the Iran-Iraq border from 1977 onward show the excavation of a straight trench 30 km long by 1.2 km wide. By April of 1981, the Iraqis had flooded the trench with water pumped from the nearby Tigris and Shatt al Arab rivers through smaller canals. Since 1982, Iran's "human waves" have attacked Basra in vain, foundering in the "killing fields" east, north, and south of that moat.

Construction has continued, often under heavy enemy fire. By the beginning of 1985, the water shield had expanded to include an artificial lake some 10 km wide, framed by the original trench and the border, and two broad channels, one heading north, the other southeast toward Abadan. Wherever the water extends, the Iraqis come in behind with artillery and armor to set up fortified positions. Our processing of the satellite data shows these encampments clearly. We supplied computer-enhanced videos to CBS and ABC news.

Since last fall, we have been working with a Dutch television company on a satellite survey of Soviet military installations. Among other things, we are attempting to locate active SS-20 missile sites and to assess the Soviet build-up in the Far East and in Afghanistan.

Amidst the flurry of claims and counterclaims as to exactly how many SS-20 missiles are deployed where, there has been no visual evidence of any SS-20 deployments released by either the U.S. government or the U.S.S.R. The number and location of the missiles has been a key factor in the decision by some European countries to accept the new U.S. missiles, but the only source of this data has been the two governments most interested in influencing the decisions. An independent assessment would be a test of the superpowers' honesty.

All national governments have an interest in promoting the perception of "threats to the nation." So long as they also monopolize the evidence for such threats — and have the temptation and the ability to exaggerate — we are all held hostage to their public relations maneuverings. Ocean Earth believes that the worldwide arms race is likely to continue until nongovernmental assessments of military threats become as credible as government declarations — until the tendency of all governments to maximize the apparent magnitude of external threats is brought into check by independent observers.

What we do is not espionage. According to a recent study by Thomas J. Keating, a legal intern at the National Association of Broadcasters, "An early viewpoint that such military sensing . . . constituted espionage was later repudiated by the current position of the states with access to space. These states now believe that remote sensing from space which provides data on military capabilities is a peaceful, lawful and stabilizing space activity."

Nevertheless, it has been perceived to be against the interests of certain people for us to publish. The parties that feel most threatened by our work (and most competitive with us) are governments. To that we can only say the era of government control over information about current military situations is over. What we alone do now soon may be done routinely by large networks and

bureaus. "Early in 1986," writes Stanley Wellborn in the National Association of Science Writers' newsletter, "several television and print organizations hope to explore the possibility of buying or leasing an orbiting photo reconnaissance satellite as a news reporting vehicle. This idea has been suggested many times over the last 20 years, but it gained new impetus in the wake of the Grenada invasion, the war in the Falklands, and the unrest in Central America."

Charles Sheffield, vice president of Earth Satellite Corp., notes that "the present generation of Landsat and SPOT spacecraft are nowhere near the technological limits of either spatial or spectral resolution. I expect to see spatial resolution in the 3- to 5-meter range by the year 2000, available worldwide for open purchase." Dr. Sheffield also predicts "The ultimate limiting factor on spatial resolution for satellite systems will be decided not by defense concerns, but by economics."

As the resolution and spectral pliability of satellite data increases, its informativeness increases exponentially. Regular use of satellite imagery will, we think, change the form and content of television news: Television will become tele-vision (far seeing). Regional contexts and large dynamic processes can be made visible, vividly and authoritatively. Synoptic views from orbit can show the conditions underlying much unrest in the world, the progress of the Soviet wheat harvest, the impact of a hurricane, changes along the Pakistan-Afghanistan border, the damage caused by acid rain . . .

At present, however, satellite surveys do not fit the rhythm of daily deadline-driven journalism. A thorough analysis requires multidisciplinary input and can take a month or more. But there are many situations where a month or two doesn't reduce the news value of what is revealed.

Ocean Earth's objective is comprehensive satellite monitoring, in video format, of the globe. We think this can only make the world a saner, safer place to be. ■

*Peter Fend and Ingo Gunther exhibit the artwork they do as individuals (Peter works mostly with large satellite photo-montages and maps; Ingo does video installations), but their current joint effort now goes into an organization called Ocean Earth, where they form the core of a shifting team of people producing extraordinary news features using methods that are themselves newsworthy.*

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—Robert Horvitz