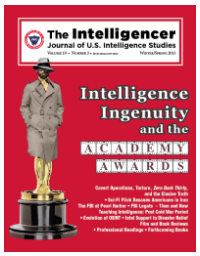

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Guide to the Study of Intelligence

Intelligence Support to Disaster Relief and Humanitarian Assistance

by Major Mirielle M. Petitjean, USAF

In the last few years, intelligence, surveillance and reconnaissance (ISR)[1] capabilities have played an important role in humanitarian assistance and disaster relief. Due to changes in law and policies that allow for more flexibility in the use of intelligence systems within the United States and the dissemination of intelligence products at lower classification levels, ISR assets help identify for first responders, federal civil agencies, and government and private aid organizations, the areas where relief efforts should be focused and what kind of supplies and aid victims need. This article highlights the usage of ISR for humanitarian assistance and disaster relief over the last decade.

HURRICANE KATRINA

The value of intelligence for situational awareness has been known for decades. The National Geospatial Intelligence Agency (NGA), the US government's imagery intelligence (IMINT) manager, has supported disaster relief operations in the US since 1992. Hurricane Katrina in 2005, however, was the first time that classified national capabilities, Air Force, Air National Guard, and Department of Homeland Security ISR assets were all deployed in support of domestic national disaster relief operations.[2] Changes in law after the 2001 terrorist attacks on the US allowed for increased flexibility in the use of ISR assets to complement and improve major domestic emergency and disaster response operations.[3]

IMINT played the largest role in helping tailor response efforts. Most of the contributing organizations provided images, maps, full motion video and terrain analyses that were used to create damage assessments and monitor the affected areas for stranded survivors and potential dangers. NGA had begun imaging critical infrastructure, such as roads and ports, around the Gulf of Mexico prior to the hurricane hitting.[4] It also pre-deployed teams of analysts and systems experts to the Gulf Coast region, which enabled the creation of the first holistic damage assessment after the hurricane struck.[5]

A sample graphic created by the National Geospatial Agency in Support of Hurricane Katrina relief efforts (source: NGA Fact Sheet retrieved from *https://www1.nga.mil/Newsroom/PressKit/Documents/hurricane_factsheet.pdf*)

The Air Force employed the U-2 "Dragon Lady," the venerable high altitude aircraft that has been in operation since 1956, which flew its first mission within a few days after the hurricane struck.[6] Other aircraft used included the OC-135 "Open Skies," a military version of the Boeing 707 equipped with a high resolution camera, and the Air National Guard's RC-26, a twin turboprop reconnaissance aircraft with a full motion video capability, and Lockheed C-130 "Scathe View," which has an infrared and electro-optical sensor.[7] The aircraft provided high-resolution

1. ISR refers to technical systems that can collect multiple types of intelligence data that are normally classified.
2. Kevin Buddelmeyer, "Lessons Learned From Hurricane Katrina" (masters thesis, Air Command and Staff College, 2007), 5-10.
3. Ibid.
4. The White House. *The Federal Response to Hurricane Katrina: Lessons Learned Report*. (Washington DC: The White House, 2006), 126.
5. Ibid. As a result of its work, NGA was one of the few federal agencies lauded in the US government's after action report on its response to Hurricane Katrina. (National Geospatial Agency, "What We Do" National Geospatial Agency On-Line. *https://www1.nga.mil/ABOUT/WHATWEDO/Pages/default.aspx* (accessed February 20, 2011).
6. George Cloutier, "U-2 Aids in Katrina Relief," US Air Force On-Line (September 13, 2005). *http://www.af.mil/news/story.asp?id=123011772* (accessed February 22, 2011).
7. Bob Dashman, "RC-26 'Eye in the Sky' Rapidly Deploys," Air National Guard On-Line (July 29, 2008). *http://www.ang.af.mil/*

imagery that analysts uploaded into a library for federal and state agencies to access.

Signals intelligence (SIGINT) also played a role in post-Katrina operations. Because of classification and the laws prohibiting electronic surveillance within the US without a warrant, SIGINT typically does not play as large a role in disaster relief. However, during the aftermath of the hurricane, the National Security Agency (NSA), which serves as the lead US agency for SIGINT, helped reconnect families that had been separated by the storm.[8] Because of NSA's efforts, the Federal Response to Hurricane Katrina Lessons Learned Report, recommended increasing NSA's role in domestic emergency response.[9]

The use of different ISR capabilities before, during and after Hurricane Katrina set a precedent for subsequent disasters. In Hurricane Dolly in 2008, RC-26 crews alerted rescue teams of people stranded in their vehicle.[10] In 2007, NGA and U-2s collected imagery showing the status of wildfires burning in California.[11] Most recently, ISR aircraft and NGA analysts aided cleanup efforts in the Gulf of Mexico after the April 2010 oil leak. NGA obtained national and commercial satellite imagery and created 3-D models to track the oil leak.[12] Imagery was used to identify surface slicks in order to direct cleaning crews to the areas requiring attention.[13]

HAITI EARTHQUAKE

One of the best examples of the use of ISR assets in humanitarian operations occurred on January 12, 2010, when a 7.0 magnitude earthquake struck Haiti, killing 230,000 and leaving widespread destruction in the capital of Port au Prince and rural areas. The US Agency for International Development (USAID) took the lead for disaster relief and on January 13 the US military received orders to assist relief efforts.[14] USAID and military personnel needed to know how much and what kind of damage the earthquake caused.[15]

US government planners relied on two primary intelligence disciplines: open source intelligence (OSINT) and IMINT to assess the damage. OSINT sources included news reports and information posted on social media networks describing the damage.[16] This information provided insights into the local situation and needs of the people living in the country. Imagery was collected by Navy P-3 "Orion" aircraft and the new RQ-4 "Global Hawk" unmanned aerial vehicle as well as imagery satellites.[17] These platforms provided full motion video and still imagery that was key to understanding the status of roads, bridges, air and sea ports, and Haitian government buildings.[18] This information helped planners determine how to get relief workers and supplies into Haiti and how to transport those people and supplies once they were in country.

As relief operations continued, the US deployed human intelligence (HUMINT) teams to gather information on the ground and additional aircraft, including the U-2, RQ-1 "Predator" unmanned aerial vehicle, RC-26s, and an experimental airborne laser imaging (LIDAR) research test bed aircraft.[19] The full motion video taken by the RQ-1s and RC-26s helped determine the accessibility of roads for aid distribution and enabled aid workers to avoid hostile situations.[20] The U-2s contributed high resolution imagery which expedited damage assessments.[21] The LIDAR, despite being experimental, provided very high-resolution 3-D graphics which, when analyzed by NGA experts, revealed the growth rates of refugee camps springing up and debris and vertical obstructions blocking travel routes.[22] LIDAR was also used to identify potential

news/story.asp?id=123108569 (accessed February 20, 2011).

8. The White House, 94.

9. Ibid.

10. Ibid.

11. 9th Reconnaissance Wing Public Affairs, "Beale Airmen, ISR Assets Support California Wildfires," *US Air Force On-line* (October 26, 2007). *http://www.af.mil/news/story.asp?id=123073471* (accessed February 20, 2011).

12. Christina H., "NSG Extends GEOINT Reach to Unclassified Communities," *Pathfinder: The Geospatial Intelligence Magazine* On-Line 8, no.6 (November/December 2010): 10-11. *https://www1.nga.mil/Newsroom/Pathfinder/novdec10/Documents/novdec2010.pdf* (accessed February 14, 2011).

13. Susan Romano, "Deepwater Horizon Airspace Activity Now Coordinated at 601st AOC," *US Air Force On-Line* (July 13, 2010). *http://www.1af.acc.af.mil/news/story.asp?id=123213296* (accessed February 15, 2011).

14. John Ryan, Russ Goerhing, and Robert Hulslander, "US-SOUTHCOM and Joint Task Force-Haiti...Some Challenges and Considerations in Forming a Joint Task Force," *Joint Center for Operational Analysis Journal* XII, no. 2, (Summer 2010): 1.

15. Ibid., 2.

16. Ibid., 2-3.

17. Ibid., 3.

18. Douglas Fraser and Wendell Hertzelle, "Haiti Relief: An International Effort Enabled through Air, Space and Cyberspace," *Air and Space Power Journal* XXIV, no. 4 (Winter 2010): 9.

19. Ryan, Goerhing, and Hulslander, 3.

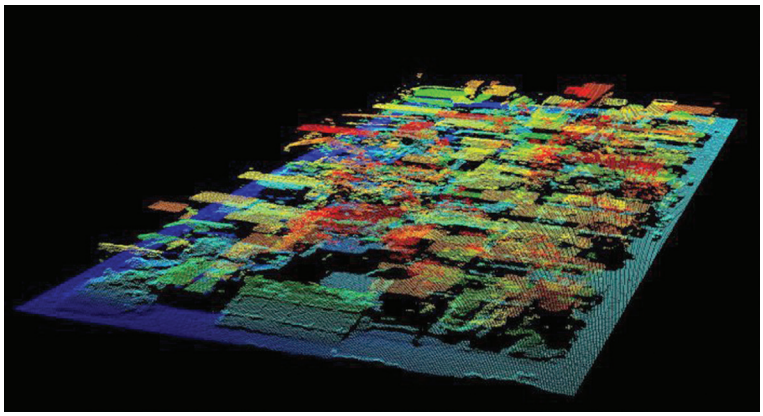
20. Laura Lundin and Jay Krasnow, "Support Teams Essential to Haiti Earthquake Response," *NGA's Pathfinder* On-Line (March/April 2010): 5. *https://www1.nga.mil/Newsroom/Pathfinder/mar_apr_10/Pages/SupportTeamsEssentialtoHaitiEartquakeResponse.aspx* (accessed February 15, 2011).

21. Fraser and Hertzelle, 9.

22. Lundin and Krasnow, 4.

flood areas and areas vulnerable to mud slides during the forthcoming rainy season.[23]

NGA coordinated the acquisition of and analyzed imagery from satellites. US government, foreign government and commercial owned satellites all provided images of Haiti after the earthquake.[24] Japan, France and Canada tasked their satellites to collect radar and electro-optical (also known as panchromatic) images of Haiti as well.[25] Commercial imagery satellites included GeoEye, Ikonos, Quickbird and Worldview.[26] All of these sources also provided pre-earthquake images of Haiti for comparison with post-earthquake pictures.



A LIDAR image of a neighborhood in Port au Prince. (Retrieved from: *http://www.opentopography.org/index.php/blog/detail/a_quick_look_at_nga_lidar_from_haiti/*, original source: NGA)

Although IMINT provided a large amount of valuable information, additional information from HUMINT was needed to create a holistic picture of what was happening inside the country. For instance, while images of hospitals could show the condition of the building, they could not show what was happening inside the building.[27] This meant that planners and aid workers did not know if the hospital could receive patients. To help overcome this and other similar problems, HUMINT teams conducted ground reconnaissance in Port au Prince and areas outside the capital to determine the status of critical infrastructure and local government offices.[28] Eventually these reports were combined with imagery to create a common operational graphic, which enabled better integration between the disparate organizations providing aid.[29]

Despite the accomplishments described above, there were many challenges that had to be overcome. The biggest challenge in Katrina and Haiti was distribution of the large amount of information to a wide range of recipients in a timely manner.[30] Another challenge was that the US possesses a limited number of ISR assets and the professionals needed to process, analyze and disseminate intelligence from these assets. With multiple concurrent missions to support, ISR planners have to balance assets against the different customers that need ISR.

These challenges are frequently recognized and highlighted in after action and lessons learned reports.[31] In Haiti, previous lessons learned contributed to the early push to get intelligence products posted on an open network.[32] This helped the government avoid the information sharing problems that had slowed down other response efforts.[33]

ISR has proven its worth in humanitarian assistance and disaster relief operations several times over the last decade. All of the intelligence disciplines contributed to damage assessments, the protection of relief workers and the delivery of supplies to where they were needed most. Most importantly, these efforts helped ease human suffering. Because of this, and despite the challenges that remain, ISR's role in these operations will likely increase in the future.

READINGS FOR INSTRUCTORS

There is little academic research that has focused on this relatively new area of ISR operations. NGA's Website, *https://www1.nga.mil/Pages/Default.aspx*, is a good place to learn more about imagery intelligence and intelligence operations supporting different contingencies. The All Partners Access Network (APAN) Website, *https://community.apan.*

23. Ibid.
24. Fraser and Hertzelle, 9.
25. Stephen Clark, "Satellite Images Show Haiti Earthquake Catastrophe," *Spaceflight Now* (January 14, 2010). *http://spaceflightnow.com/news/n1001/14haiti/* (accessed February 14, 2011).
26. Ibid.
27. Ryan, Goerhing, and Hulslander, 3.
28. Ibid., 3-4.
29. Ibid., 4.
30. Buddelmeyer, 21-22; The White House, 94; and Ryan, Goerhing, and Hulslander, 4.
31. Ibid.
32. Ryan, Goerhing, and Hulslander, 4.
33. Ibid.

org/, is frequently used by the US government as a collaboration network during crises.

Buddelmeyer, Kevin. "Lessons Learned From Hurricane Katrina." Masters Thesis, Air Command and Staff College, 2007.

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