High-Resolution Satellite Imagery and the Conflict in Eastern Burma

Summary Report

September 28, 2007
This report was produced by the Geospatial Technologies and Human Rights project as part of the Science and Human Rights Program (SHRP; http://shr.aaas.org) of the American Association for the Advancement of Science (AAAS). SHRP brings scientists and scientific expertise to efforts to achieve human rights around the world. As a program of AAAS - the world’s largest multidisciplinary scientific membership organization - SHRP engages scientists and marshals scientific tools, techniques, and technologies to enhance the impact of human rights work, promotes the human right to benefit from scientific progress (Article 15, ICESCR), and brings human rights norms to the conduct of science.

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Disclaimer
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Summary

Since late 2006, the Science and Human Rights Program of the American Association for the Advancement of Science has compiled a set of high-resolution satellite images to document the ongoing conflict in Karen State and other regions of Burma. This study in Burma follows similar activities undertaken by AAAS on Zimbabwe, Darfur, and elsewhere as part of its Geospatial Technologies and Human Rights project. Primary funding for this project comes from the Open Society Institute, with significant resources provided by the John D. and Catherine T. MacArthur Foundation as well.

Monitoring human rights violations in eastern Burma with satellite imagery utilizes on-the-ground information reported via websites and email from organizations active in the region. These organizations include the Free Burma Rangers, the Karen Human Rights Group, and the Thailand Burma Border Consortium. Their reporting was reviewed by AAAS staff and compared with a set of geospatial data and traditional maps on eastern Burma to precisely locate villages and areas that may have been attacked. These locations were then compared with existing archives of commercial, high-resolution satellite imagery, and in many cases new satellite imagery was ordered as well. Using these sets of satellite imagery, AAAS staff determined if visible evidence of reported attacks was found.

At present, AAAS has obtained and analyzed high-resolution commercial satellite imagery covering a few small areas of eastern Burma. Specifically, about 2,000 square kilometers of the Papun, Toungoo, and Dooplaya Districts of Karen State, and a small area of Shan State, have been assessed. In addition, growth of a refugee camp in Thailand was also documented. Twenty-five sites from the imagery that correlate with reporting from the region are presented below, including possible evidence of destroyed villages and houses, possible evidence of forced relocation, and expanded military camps in the area. These findings are detailed in the following pages and are also available for viewing on Google Earth (see Appendix A).

AAAS efforts to acquire and analyze imagery and other data concerning the conflict in Burma are continuing as further input on the process is sought. AAAS welcomes comments and questions on its work to date, on any possible future image acquisitions, and input on attack locations in general. Please send such information, and any other comments, to Lars Bromley (lbromley@aaas.org; 202.326.6495).
Image Analysis in Eastern Burma

Satellite image analysis regarding the conflict in eastern Burma by the American Association for the Advancement of Science (AAAS) seeks to corroborate reporting gathered by organizations already active in the region. AAAS analyzes information from such organizations, and then – if possible – reviews satellite imagery that might corroborate reported attacks on civilians and other human rights violations. AAAS undertakes this work within its Geospatial Technologies and Human Rights project, part of the Science and Human Rights Program. The broader project is funded by the John D. and Catherine T. MacArthur Foundation, with funding specifically for imagery of eastern Burma provided by the Open Society Institute. More information can be found at http://shr.aaas.org.

Reporting from the Free Burma Rangers (FBR; http://www.freeburmarangers.org), the Karen Human Rights Group (KHRG; http://www.khrg.org), the Thailand Burma Border Consortium (TBBC; http://www.tbbc.org), and other sources provided information concerning attacks especially occurring from 2005 thru the present. In many cases, these organizations have compiled reporting on the conflict from their various sources into publications accessible via their websites. Where necessary and possible, the locations of these attacks were precisely identified by comparing reporting with maps provided by these groups and the GEONet Names database of village coordinates provided by the US National Geospatial-Intelligence Agency (http://www.nga.mil).

Note that the process of precisely locating such attacks based on reporting is relatively laborious and difficult given the necessary translations and transliterations between local languages into the Latin (English) alphabet, as well as the general paucity of highly detailed maps and geospatial data for the region. In some cases, coordinate information was communicated directly by the sources in the region, greatly easing the process. With specific attack locations in-hand, AAAS then researched and acquired satellite imagery to attempt visual confirmation of the reported attacks.

Using ‘before’ and ‘after’ imagery, certain changes – such as the razing of a village – can be identified and analyzed. Specifically, by visually comparing the newer imagery with images collected prior to reported attacks, features such as villages and structures that have been removed in the intervening years are relatively easy to identify. Likewise, new construction, such as military bases or recently added villages, is also relatively easy to identify. Some other features, such as agricultural abandonment and burn scars, can be tentatively identified, though they may require deeper levels of analysis not always feasible. Visual inspection of the imagery is the primary methodology in use, and in some circumstances multispectral analysis is also utilized.

About the Imagery

Since 2000, high-resolution commercial satellite vendors have acquired imagery with their respective satellites, largely for areas where customers request images. Once imagery is acquired from a satellite, it is then added to the companies’ archive and generally made available for resale. In the case of eastern Burma, this has resulted in a sparse archive of imagery for a few areas, and non-existent coverage for other areas. Based on the locations of attacks reported by FBR, KHRG, TBBC, and other sources, AAAS searches these archives for available imagery covering these attack locations. Imagery that brackets a reported attack, in that one image was
acquired before the attack and one image after the attack, can sometimes be found entirely in the archives. More often, while a ‘before’ image can be found in the archive, an ‘after’ image needs to be newly acquired, in which case AAAS places an order for such an image. Unfortunately, there is frequently no available archive imagery for the locations of interest, making comparison of ‘before’ and ‘after’ images impossible. In these cases, if the attack in question was very recent and featured the burning of homes or significant destruction of buildings, an attempt at verification can be made only with a newly acquired image ordered by AAAS.

AAAS uses several types of commercial satellite imagery in this analysis, each with one meter or better spatial resolution. Spatial resolution refers to the degree of detail the satellite sensor can ‘see,’ and thus the finer the resolution the more information on conflict effects the sensor can provide. While resolution continues to improve, slowly, imagery with fine enough resolution is currently available from three satellites. Two of these satellites, OrbView-3 and Ikonos, are operated by the GeoEye (http://www.geoeye.com) company. OrbView-3 has panchromatic (black and white) one meter spatial resolution; Ikonos is a multispectral (color) satellite with one meter panchromatic resolution. The QuickBird satellite, the last primary satellite used by AAAS, has multispectral 60 centimeter spatial resolution and is operated by DigitalGlobe (http://www.digitalglobe.com). While QuickBird provides the greatest level of detail and is thus generally used for new image acquisitions, OrbView (now disabled) and Ikonos have been in orbit longer and have collected the bulk of archival imagery for Burma.

AAAS has thus far acquired 2,956 sq. km. of imagery covering Karen State, with small areas of Shan State and Thailand also included. This imagery covers 1,931 sq. km. on the ground, and 2,085 sq. km. were purchased from the archives while 871 sq. km. were new collections ordered by AAAS over the last year.

**Challenges**

Challenges using commercial imagery for conflict assessment in Burma are numerous. As mentioned above, precisely finding specific locations based on reporting is relatively difficult. In addition, physiography and climate entail a mountainous, heavily vegetated region with frequent cloud cover that combine to often simply block observation satellites. Small home sizes, often built along treelines or totally beneath canopy, also make for difficulty in positively identifying structures in the area using commercial-grade satellite imagery. The relative paucity of imagery for Burma means that, often, no archival imagery exists for a given location and thus before-and-after comparisons are not possible. Trying to determine if a village was once present in a location based only on a single, newly collected imagery can be exceedingly difficult given the rapid vegetation growth and ecosystem dynamics of eastern Burma. Likewise, even if a ‘before’ image is available, the time period between the before-and-after images leaves open the possibility that other factors may account for any changes seen. In some cases, a span of almost seven years has passed between image acquisitions, thus raising the possibility that other factors might account for the observed changes.

The military tactics in use likewise hinder detection of their effects via commercial satellite imagery. Specifically, in the case of the conflict in Burma, villages are often not destroyed but damaged and sometimes abandoned, with residents driven out. Identifying a damaged or abandoned village can be more difficult than identifying a razed village. Subtle changes in vegetation would be the most obvious clue, but such analysis generally requires longer
timeframes and more imagery to evaluate according to the varying stages of seasonal vegetative growth. Similarly, other reporting indicates mortar fire is common in the area, used as a harassment tactic and to deny access to agricultural fields. Scattered mortar fire, however, will have relatively small impact areas that may not be visible for long given the rapid vegetation growth in the region. In addition, much reporting indicates that many attacks in the region are interpersonal in nature, including harassment or perhaps the killing of one or a few people, and/or assault on a similar scale. Commercial satellite imagery is of course not appropriate for analyzing such attacks.

Results

Reporting from the field provided specific locations and dates of more than 70 attacks in Karen State and surrounding areas during mid-to-late 2006 and early 2007. Of these, AAAS was able to positively locate 31 attack sites, which comprised the sample set indicating where attacks took place. In addition, a set of information on many attack locations without specific dates over the last several years was also obtained, and used to corroborate other reporting and delineate likely conflict areas and time periods. With such information, AAAS searched for available Ikonos, QuickBird, and OrbView-3 satellite imagery collected in previous years that encompassed the regions and dates of reported attacks. In areas where archive imagery was available, the imagery was purchased and, if necessary, new imagery collections were ordered from DigitalGlobe’s QuickBird satellite to create the before-and-after sets. Note that for a few locations with reported attacks in April, 2007, no before imagery was available, and thus analysis for that area was performed only on newly collected imagery.

Within the areas of imagery analyzed, 25 sites of interest are presented in the following pages (see Table One and Figure One for summaries). The bulk of these sites (18) are removed villages or villages with removed structures, with other sites including military camps (4), possible forcibly relocated villages (2), and one refugee camp on the Thai border. In a few cases, burn scars consistent with recently reported village burnings were found in the imagery. In addition, the possible forcibly relocated villages are only a small sample. When areas proximate to an identified military camp in Papun District were reviewed to corroborate reports of forced
relocation, 31 new villages were located that appeared between the image acquisitions of 2000/2001 and late 2006.
<table>
<thead>
<tr>
<th>Image</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Location</th>
<th>Analysis Summary</th>
<th>Attack Dates</th>
<th>Citation</th>
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<td>April 2006 onward</td>
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<td>military camp</td>
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<tr>
<td>6</td>
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<td>97.23 E</td>
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<td>military camp (aux. camp)</td>
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<td>96.71 E</td>
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<td>Nov. 2005 onward</td>
<td>KHRG: #2006-F8; #2006-B5; #2006-B7</td>
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<td>18.86 N</td>
<td>96.71 E</td>
<td>Toungoo District, Karen State</td>
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<td>Nov. 2005 onward</td>
<td>KHRG: #2006-F8; #2006-B5; #2006-B7</td>
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<tr>
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<td>18.95 N</td>
<td>96.82 E</td>
<td>Toungoo District, Karen State</td>
<td>military camp</td>
<td>Nov. 2005 onward</td>
<td>KHRG: #2006-F8; #2006-B5; #2006-B7</td>
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<td>15.70 N</td>
<td>98.35 E</td>
<td>Dooplaya District, Karen State</td>
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<td>2002 – 2007</td>
<td>KHRG (various); FBR (various); TBBC</td>
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<td>20</td>
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<td>2002 – 2007</td>
<td>KHRG (various); FBR (various); TBBC</td>
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<td>KHRG (various); FBR (various); TBBC</td>
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<td>97.51 E</td>
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<td>TBBC; KHRG (various); FBR (various)</td>
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<td>2005 – 2007</td>
<td>TBBC; KHRG (various); FBR (various)</td>
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<td>97.50 E</td>
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<td>2005 – 2007</td>
<td>TBBC; KHRG (various); FBR (various)</td>
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<td>Thailand</td>
<td>refugee camp</td>
<td>April 2007</td>
<td>FBR: April 26, 2007</td>
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</table>
Papun District Image Analysis

Overview

Reporting identified Papun District as experiencing intensified conflict and internal displacement especially from late March, 2006 onward, and coordinates received from the field identified a specific set of villages burnt on and around April 22, 2007. Reports indicated that 33 military camps were built in the area in 2006 and existing camps were enlarged and used as bases for military operations and internment. Attacks in this area are documented specifically in KHRG reports as well as by FBR, and supported by information from TBBC (see Table One).

Images from 2000, 2006, and 2007, covering a portion of Papun District, were compared with one another to derive results. Imagery analysis located nine settlement areas that had been visibly disturbed, burnt, or destroyed (see images 1 thru 4 and images 7 thru 11). A military camp and an auxiliary military camp were also identified in the study area [images 5 and 6]. Analysis of 93 sq. km. surrounding the military camps indicated 31 possible sites of forced relocation, indicated by the appearance of new villages and groups of structures between imagery collected in 2000 - 2001 and a new satellite image acquired in late 2006. Samples of these 31 sites are presented in Images 12 – 13. Figure Two summarizes these locations.

Images 1 – 4 and 10 – 11 correspond with the reported attacks around March thru May of 2006, and the area believed to be the site of the village burnings in April 2007 is presented in Images 7 - 9.

Of special interest, reporting concerning the April 2007 attacks identified a number of villages that had been burned by the military in the northern Papun District area. Given the report of burning, which produces recognizable scarring on the land surface, a new image of the areas was ordered, though no before imagery of some areas was available. Despite the fact that the monsoon clouds had moved in for the season, in mid-June the clouds cleared briefly one morning and an image was successfully collected for the area.
Image 1: Removed Village

Before Image: 11-Nov-2000

After Image: 13-Dec-2006

The top image depicts a settlement adjacent to rice paddies in 2000. The after image from December 2006 shows the same area of land with all structures removed. Note: a similarly sized settlement appeared 1 km north in the interim. This area was reported attacked in April 2006. (Lat: 18.41 N  Long: 97.26 E)
The top image shows a 6-structure settlement in 2000; all structures are removed from the 2006 image (bottom). This area was reported attacked in April 2006. (Lat: 18.42 N Long: 97.26 E)
The top image shows 5+ structures along a densely-wooded ridge in 2000. All structures are removed in the corresponding 2006 image. This area was reported attacked in April 2006. (Lat: 18.39 N  Long: 97.24 E)
The top image depicts a settlement of 6-10 structures in 2000. The majority of structures are removed in the 2006 image; significant forest growth is also seen. This area was reported attacked in April 2006. (Lat: 18.36 N  Long: 97.24 E)
This particular camp was identified from a report disseminated by the Free Burma Rangers that reported a major expansion of the camp in 2006. Bamboo fencing was erected around the camp, visible in the after image above. (Lat: 18.42 N  Long: 97.23 E)
This image is of a suspected military camp developed between November 2000 and the date of this image, December 13, 2006. This is likely a satellite camp, lying about a kilometer from the larger military camp depicted in Image 5. (Lat: 18.42 N  Long: 97.23 E)
The settlement in the image pair above has experienced the removal of at least 3 structures. This corresponds with reported attacks in the area in April of 2007. (Lat: 18.56 N  Long: 97.06 E)
Multiple dark burn scars can be seen in the image above, likely representing settlement structures that were burnt in the reported April 2007 attacks. No “before” imagery for the area is available. (Lat: 18.54 N  Long: 97.05 E)
Two burn scars can be seen in the image above between two standing structures, corresponding with reported attacks in April 2007. No “before” imagery for the area is available.

(Lat: 18.54 N  Long: 97.06 E)
The top image shows 2 - 5 small structures in November 2000, with those structures removed by the December, 2006 image. This location is 4.1 kilometers from the military camp shown in Image 5 (Lat: 18.43 N  Long: 97.25 E)
Image 11: Removed Village

The top image shows a small cluster of huts and a path in 2000, with the after image showing those features removed by late 2006. This location is 2.5 kilometers from the military camp shown in Image 5 (Lat: 18.43 N  Long: 97.24 E).
The two villages indicated by the red arrows in this image appeared between February 2001 and the date of the above image acquisition, December 13, 2006. Reporting indicates numerous instances of forced relocations to this area, which lies 3.7 kilometers from the military camp shown in Image 5. In Papun District, analysis of 93 sq. km. surrounding the military camp indicated 31 possible sites of forced relocation, indicated by the appearance of new villages and groups of structures between imagery collected in 2000 - 2001 and a new satellite image acquired in late 2006. (Lat: 18.42 N Long: 97.26 E)
The four areas of housing indicated by the red arrows in this image appeared between November 2000 and the date of the image acquisition, December 13, 2006. Reporting indicates numerous instances of forced relocations to this area, which lies 5.6 kilometers from the military shown in Image 5. In Papun District, analysis of 93 sq. km. surrounding the military camp indicated 31 possible sites of forced relocation, indicated by the appearance of new villages and groups of structures between imagery collected in 2000 - 2001 and a new satellite image acquired in late 2006. (Lat: 18.41 N, Long: 97.29 E)
**Toungoo District Image Analysis**

**Overview**

Reporting indicates that southern Toungoo District has been the site of increased military activity in 2006 and continuing into 2007, including military camp development, and dam and road construction. Attacks corresponding with these developments are widely reported by KHRG (see Table One) and corroborated by reporting from FBR and TBBC.

A number of villages are reported as having been burned and bombarded with mortar fire. Other villages have simply been abandoned, usually due to military harassment. In particular, military activity has been concentrated along the east-west road from the Pegu Division in the west to Karenni State in the east, running through the larger-sized settlement Bawgali Gyi; and the southeast running road from Bawgali Gyi to BuSahKee and Papun District. Several dam construction projects in the area also drive attacks as reported by FBR and KHRG.

Archival images from May and March, 2004 was compared with a new collection from February, 2006. Image analysis located three settlement areas that had been visibly disturbed, abandoned, or destroyed [see Images 14 thru 16] and also identified military camps [see Images 17 and 18]. These sites are summarized in Figure Three.
The before image depicts a small settlement with all structures removed from the area. The identified area corresponds with FBR reported December 2006 village attacks at and near the village of Kwey Kee (Lat: 18.79 N  Long: 96.76 E)
The top image shows 8-10 small structures in March 2004, with the after image showing those structures removed by late February, 2007. (Lat: 18.86 N  Long: 96.89 E)
Image 16: Removed Structures

Before Image: 5-May-2004

After Image: 23-Feb-2007

The before image depicts a mid-size settlement of approx. 25 structures; in the 2007 image at least 3-5 of those structures are no longer present. (Lat: 18.82 N Long: 96.71 E)
The top image shows a military camp near a large settlement in 2005. Expanded layers of fencing should be noted in the 2007 image, along with the presence of small structures within the boundaries. These could be tents or military vehicles or both. (Lat: 18.86 N  Long: 96.71 E)
In the 2007 image a possible military camp can be seen adjacent to the settlement; it was built up during the three-year gap between image acquisitions. A close-up of the camp is found in Image 19. (Lat: 18.95 N  Long: 96.82 E)
This image from February, 2007 shows a close-up of the possible military camp, seen in Image 18. Layers of fencing can be seen in the upper-left corner.
**Dooplaya District Image Analysis**

**Overview**
Dooplaya District is in southern Karen State and has experienced conflict for many years, with the military government and its allies taking firm control of the region after a major offensive in 1997. Reporting from FBR and KHRG (see Table One) indicates attacks continue to this day, corroborated by reporting from TBBC. Village attacks, forced displacement, destruction of agriculture, and forced labor have been the main tactics in use in the area.

Archival images from January, 2000 were compared with archival images from November, 2006. Much of the area analyzed was devoid of any large settlements visible in the though much agriculture was present throughout. The following image pairs present areas of possible settlement destruction, and associated agricultural abandonment.

While a variety of factors may account for removal of the structures and crops in the intervening time period, reporting does indicate both the destruction of villages and agricultural sites, and creation of new agricultural areas, with forced labor, as part of attacks across the region.
The before image above depicts a cluster of structures and a nearby possible palm oil plot that are not present in the after image. (Lat: 15.70 N  Long: 98.35 E)
A cluster of approximately 4 structures in the before image are no longer present in the after image. This corresponds with attacks reported to have occurred in the area between mid-2005 and mid-2006. (Lat: 15.73 N  Long: 98.32 E)
An additional site of possible structure removal and agricultural abandonment (Lat: 15.71N Long: 98.32E)
Shan State Image Analysis

Overview
The ethnic conflicts that disrupt civilian life in Karen and Karenni States (also known as Kayah State) spill over into southern Shan State. The relations between the military government and their allies and resistance groups in the region is complex with the recent history marked by ceasefire agreements, the subsequent breakdown of the agreements, and intervening human rights abuses that occur. Village attacks and forced relocations have been a recurrent theme in 2005 and 2006 according to KHRG and FBR reporting. Specific locations of village attacks analyzed with satellite imagery were obtained from TBBC.

An archival image from January, 2000 was compared with newly collected image from February, 2007. Within the imagery that was purchased, three areas were identified where settlements or structures had been removed or apparently damaged.
Image 23: Removed Structures

Before Image: 14-Jan-2000

After Image: 01-Feb-2007

The before image above depicts an approximate 24-structure settlement. The corresponding after image from 2007 shows all structures either completely destroyed or severely damaged. The damage corresponds with attacks in the area reported as having occurred between mid-2005 and mid-2006. (Lat: 19.94 N Long: 97.51 E)
Image 24: Removed Structures

Before Image: 14-Jan-2000

After Image: 01-Feb-2007

Image pair above depicts approximately 17 structures that have been removed in the 2007 image, corresponding with reported attacks against villages in the area occurring sometime between mid-2005 and mid-2006. (Lat: 19.98 N  Long: 97.52 E)

(© 2007 GeoEye)
The 2000 image above depicts a settlement of approximately 43 structures. In the after image an estimated 23 structures are removed, destroyed, or damaged. (Lat: 19.95 N Long: 97.5 E)
**Thailand Image Analysis**

**Overview**
In addition to looking at areas in Burma that have experienced human rights violations, AAAS is also providing documentation of the expansion of refugee camps in Thailand near the Burmese border. The TBBC estimates 154,000 refugees have crossed the border into Thailand as of 2006. Nine camps have been established along the border extending from Karenni State in the north to Tenasserim Division in the South since 1996.

TBBC reporting identifies a number of camps that have experienced significant growth in recent years. AAAS has provided imagery of one particular camp – Mae La Oon, adjacent to Karen State in Thailand’s Mae Hong Son province – that was built up in 2004 and is home to 15,345 refugees as of March 2006.

Imagery covering the area of Mae La Oon was acquired from GeoEye dating to 14-Nov-2002. This imagery was compared with a high-resolution QuickBird image dating to 2005. The comparison of images between 2002 and 2005 showed a dramatic build-up of the refugee camp. Hundreds of structures ranging in size and cluster density are built along the slopes leading up from the river, a tributary of the lower Salween River. Image samples documenting this build-up can be found below.

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![Figure Six: Thailand Site](image)

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The images above depict the Mae La Oon refugee camp in Thailand, transitioning from a few structures in 2002 to hundreds in 2005 (Lat: 17.79 N  Long: 97.78 E)
Image 27: Close-ups of Mae La Oon Refugee Camp


Two image sets of areas within Mae La Oon refugee camp. In each image pair significant build-up can be seen between the 2002 and 2005 images.
Next Steps

AAAS is continuing to acquire new satellite imagery based on lessons learned over the past year. Areas with ongoing attacks on villages will be imaged as soon as possible. Currently, two separate areas in eastern Burma are awaiting new image collections, and AAAS will identify other areas experiencing attacks so that further images can be acquired. These image acquisitions will be supported, to the extent possible, by MacArthur Foundation funding.

AAAS would also like to engage reporting organizations and other parties in the image analysis process. Such interaction can help to answer important questions regarding the specific features seen in the imagery. AAAS also would like to encourage reporting organizations to begin summarizing their information in simplified, tabular format, detailing the village name, attack type, and latitude and longitude where possible. This would greatly speed the AAAS geocoding process and is hopefully relatively easy for the reporting organizations.

AAAS also is investigating the possibility of developing a Web-based geospatial information portal of the Burma conflict. This portal would, to the extent possible, summarize attack-related information and provide access to satellite imagery to a select group of NGOs. Lastly, AAAS will begin making available, via a Web site, its tools for roughly matching village name spellings with coordinates and available satellite imagery. Ideally, all these tools together will improve information-sharing regarding the conflict in Burma, and improve collective understanding and planning efforts.

AAAS very much encourages input and recommendations from colleagues working on this issue. Please do not hesitate to contact us with any information, comments, or questions on this work. Contact Lars Bromley, 202.326.6495, lbromley@aaas.org.
Appendix A: Google Earth Layer

All the satellite imagery discussed in this report is available via the hyperlink below and using the free software Google Earth. Areas referenced by the Images in the report are likewise indicated using clickable place markers.

Please note that the file below requires Google Earth Release 4 or later. Earlier versions cannot display the imagery. When the below Google Earth KML file is loaded, all imagery locations and “before” image samples are displayed and most research results can be accessed via their descriptions. The content is organized according to District and State, the same as with the above content. To compare the before/after imagery, users should select the appropriate image set from their ‘Places’ menu. Note that offset is common in the image pairs. They will be rectified as possible.

Other organizations are encouraged to consider this content as available for any future media project using Google Earth. For example, a Burma Google Earth product modeled after the Darfur layers released by the U.S. Holocaust Memorial Museum¹ might be ideal.

Please send all questions and comments to Lars Bromley (lbromley@aaas.org).

Google Earth KML:

http://www.aaas.org/international/geotech/ge/burma/burma_results.kml

¹ See: http://www.ushmm.org/googleearth/