

Goldspotted Oak Borer and Oak Mortality

Quarterly Situation Report

October 1 through December 31, 2011



This photo shows a dead, pre-emerged GSOB adult trailed by its own frass in its pupal chamber from a test bolt cross section treated with Astro pesticide (a series of other cut cross sections are shown in the inset photo) from the 2011 pesticide trial on GSOB-infested bolts (wood rounds). Note that the insect almost made it to the surface of the bark before dying. Perhaps the beetle was in the process of chewing its way to the outside and was killed when it ingested some of the pesticide that had soaked partially into the bark, but that assumption needs to be verified. Results from this initial “Pesticide as a Barrier to GSOB Emergence” trial have been sufficiently encouraging to prompt us to repeat the study next spring using more sophisticated techniques (having learned from the first study). UCCE’s Dr. Tom Scott and GSOB Coordinator Kevin Turner teamed up with USFS entomologist Sheri Smith for these trials.

General Observations

Fortunately for us all, there has been no apparent significant expansion of the GSOB infestation or new finds of GSOB outside of known infestation areas in 2012. Why this is so, we do not know for sure. Could it be that the extremely wet and cool winter and spring seasons and mild summer have somehow played a role and is masking new GSPB attacks because the trees have a surplus of available moisture to fend off attacks more successfully for this year? We believe that our collaborative education and outreach efforts with government agencies, elected officials and the general public combined with reaching out to the professional arborist and firewood industry have had an impact on the movement of oak firewood. Of course, some oak wood does continue to move out of the infested area and there may be new areas of infestation that have just not yet made themselves manifest.

San Diego GSOB Steering Committee

A Steering Committee meeting was held at Rancho Bernardo on November 8th. The next Steering Committee Meeting will be held in February at a date and place yet to be determined.

CAL FIRE Unit Chief Howard Windsor has retired and his successor is our good friend and GSOB confidant Thomas Porter. The new Cleveland NF Descanso District Ranger is Donn Christenson.

We have developed a GSOB issue paper for presentation to legislators and the Board of Forestry designed to foster a legislative hearing or similar type event. Final review on this document is nearly completed and will be distributed in January. Katie Palmieri has been taking the lead on this with help from Kevin Turner, Kathleen Edwards, Tom Scott, Jan Gonzales and others that have offered comments and suggestions.

ARRA Grant-funded personnel Katie Palmieri, Kevin Turner, Janice Alexander, and Jan Gonzales have worked together with CAL FIRE's Forest Pest Specialist Kim Camilli to develop a two-page (back-to-back) GSOB awareness letter that is being distributed to southern California members of the International Society of Arboriculture by the Western Chapter President of ISA. The letter features an improved GSOB lifecycle diagram on the second page thanks to the efforts of Kim Camilli. The letter will also be printed out in hard copy format as a handout and posted at the GSOB website



Maureen Anderson of the Descanso RD of the Cleveland National Forest, Jan Gonzales of UCCE San Diego, and Kevin Turner, Tom Scott and Kathie Carter of UCCE/UCR are collaborating on development of publications and web pages describing why, where, what and how to replant areas attacked by GSOB.

The Research/Education/Outreach Committee has been developing GSOB-infested oak wood handling protocols/Best Management Practices (BMPs) pamphlets and similar publications for distribution in both printed and web page formats.

GSOB Meetings/Presentations for the Quarter

11/17/2011 - 11/18/2011	<u>Council of Watershed Health Oak Seminar (LA County)</u>
11/16/2011	<u>San Bernardino Fire Safe Alliance</u>
10/26/2011 - 12/23/2011	<u>Operation Snapshots at International Border (3)</u>
10/17/2011	<u>UCANR Spanish GSOB Outreach</u>
10/13/2011 - 10/17/2011	<u>BSA San Diego Council Roundtable</u>
10/6/2011	<u>San Bernardino County Association of Governments</u>

(Reminder: please post any GSOB-related meetings on the Collaborative Tools calendar!)

USFS Forest Health Protection – Tom Coleman

Survey, Detection, Monitoring

- Forest Health Protection surveyed Los Coyotes and Santa Ysabel Reservations for presence of the goldspotted oak borer. No infestation was found on the Los Coyotes Reservation, but GSOB infestation and associated tree mortality was observed on the Santa Ysabel Reservation. GSOB populations were found on the Santa Ysabel tracts on Mesa Grande. This find represent the most northwestern extent of the infestation.

Science Activities and Findings

- Forest Health Protection continues to monitor levels of tree injury and mortality from GSOB on the Descanso Ranger District, Cleveland National Forest. This work represents the third year of data for these trees. This work will be summarized for the 2012 Forest Health Monitoring National Report later this spring.

Greater San Diego Resource Conservation District – Danielle Campbell

The Resource Conservation District of Greater San Diego County (RCD) administers the Dead, Dying and Diseased “D3” Oak Tree Mortality and Fuels Reduction Program through funding provided by the United States Forest Service (USFS) and here is what we have been up to:

The week of January 16th the RCD D3 Program will be finishing up the tree removals in Corte Madera, Pine Valley, Guatay, and Descanso. This was Phase II of removals under our D3 grant and during this phase we have removed 738 trees. All of the material removed from the homeowner’s properties is being ground on site in Descanso and then trucked Mecca to be used at the Colmac Energy plant. We have had an overwhelmingly positive response from the homeowners of these communities, they are all very thankful to get some assistance with this horrendous problem.

Every week we get calls from homeowners who have newly dead trees on their properties or who missed us the first time and want to know if we will be continuing our program. We continue to see newly dead trees in these communities and therefore the problem is still present and will continue to wreak havoc on these communities for a long time to come.

We will be offering a chipping program to these communities to finish out the funding of our grant but we will not be offering any more tree removals. As of now we have no future funding and our program will be ending in the next couple months.

California Firewood Task Force – Janice Alexander and Katie Palmieri

The California Firewood Task Force continues to meet bi-monthly to coordinate activities related to firewood outreach and management. Within participating agencies, there has been progress in getting a consistent firewood message incorporated into camp fire permits (Forest Service and Cal Fire) and to develop Best Management Practices regarding firewood. Externally, the group has begun to reach out to constituents such as recreational vehicle owners, off-roaders, hunters, arborists, and fire safe councils in an effort to increase participation and extend the “buy it where you burn it” message to a larger segment of the general public. The Task Force was also well represented this fall at the 7th Continental Dialogue on Non-Native Forest Insects and Disease meeting in Boulder, Colorado, where we networked with those involved in the effort to address non-native forest pests, including the national Don’t Move Firewood.org campaign.

In the absence of firewood regulations, public education continues to be the main focus of activities. The “Firewood Pest Passport” youth activity was mostly recently exhibited at the Bay Area Science Festival in November 2011 and will be made available for other upcoming events in 2012; an events calendar is being created for this kind of public outreach. The summer 2011 campground outreach campaign and survey – which took place primarily in San Diego County and focused on GSOB – yielded

data that will be analyzed to help refine the messaging and delivery going forward. Work is ongoing to create and distribute additional outreach materials and to plan for the summer 2012 outreach campaign.

Descanso Ranger District, CNF: oak reforestation - Maureen Anderson

Descanso Fire Compound project, one year monitoring. In late January and early February 2011, eighty six acorn plantings, utilizing root guards, 3X3 vispore weed mats, and two types of tree shelters, tubular and conical (Tubex & Tree Sentry), were accomplished in areas where dead oaks had been removed. Acorns had been collected directly from Coast Live Oak trees on the site and refrigerated for over a month before planting.

Almost a year later, 71 of the 86 plantings have live seedlings (82%). The fifteen tree shelters (7 Tubex/8 Tree Sentry) that had no or dead seedlings were easily reseeded with 2 acorns each; these acorns were collected 12/2011 from trees on site for this purpose and refrigerated after float-testing. Overall, planting, weeding & reseeded with the self-staking 18" conical shelter proved much easier and less time consuming than with the tubular shelter. Growth results between the two show no significant difference at this time.

Monitoring results:

- 71 out of 86 plantings had healthy seedlings for an 82% success rate
- 3 seedlings ranged from 20-25.5"
- 22 seedlings ranged from 11-16"
- 27 seedlings ranged from 7-10.5"
- 19 seedlings ranged from 4-6"
- **Mean height: 9.2"**



Burnt Rancheria Campground Project: over 500 Black Oak acorns were collected in October from the campground in Mt. Laguna. Two loops of the campground have been flagged for up to 200 plantings utilizing gopher guard/conical tree shelters/vispore weed mats this winter with the assistance of Descanso Middle School students.

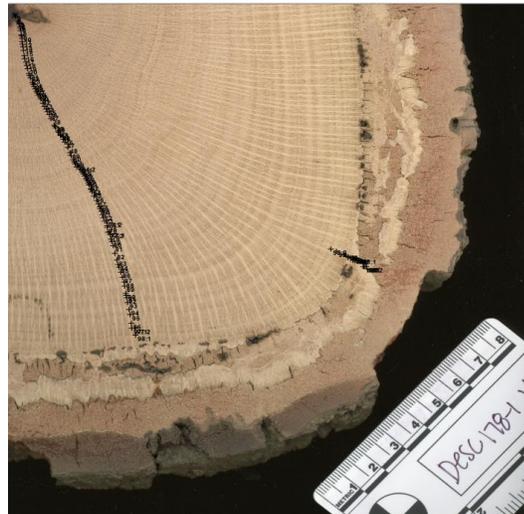
University of California ARRA Grant Activities – Dr. Tom Scott, Kevin Turner

1. *Dating outbreaks by Dendrochronology – Doctor Brett Goforth*

Progress of work:

To date, a total of 2,461 wood samples have been collected from stem cross-sections of oak trees among 38 GSOB infestation localities in San Diego County. Of this collection, 1,044 wood samples have been prepared for analysis by sanding the cross-section to a flat reflective surface. A high optical-resolution desktop scanner has been used to scan the sanded surfaces, producing 1,960 images at 1,200 dpi resolution, which show tree growth rings and characteristic wounds caused by GSOB in microscopic detail. The scanned images are saved in the bitmap raster format, with individual images having file sizes from 200 mb to 800 mb (depending upon the size of the wood sample). A total of 850 gb of scanned image data have been generated and archived on a 3 tb hard drive. A total of 4 undergraduate student assistants and one specialist continue to process the inventory of collected wood samples.

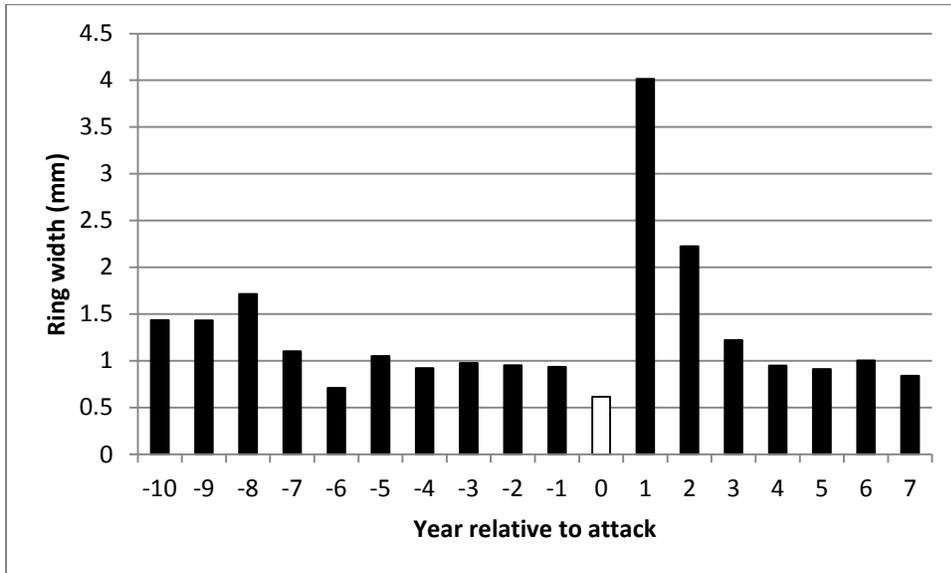
Three desktop computers are being used by the student assistants to digitally count and measure the tree rings using a dendrochronology software program called CDendro (version 7.4, March 31, 2011 release, Cybis Elektronik & Data AB, Sweden). Two microscope workstations simultaneously provide live digital camera views of wood samples for comparison to the scanned images analyzed using CDendro.



Observations of interest:

In the past quarter, the annual growth rings of 221 wood samples were digitally counted and measured using CDendro. To date, the earliest detected year of oak tree death from GSOB attack (recorded by scars in tree rings) has been dated to the year 2000. The data set of tree ring measurements allow for evaluation of tree growth as response to stress in the years before and after initial GSOB attack (see figure). For example, a preliminary analysis of tree ring widths from a sampled stand of dead Live Oak trees in Descanso shows the radial growth increment declined for several years prior to GSOB attack. The decline is attributed to a response to drought stress as well as competitive interaction of the trees. The year of initial GSOB attack In the year following GSOB attack significantly increased. The rings ring widths then decreased until the trees ultimately died. This suggests that trees were stressed by many

environmental factors before GSOB attack, and that for several years after initial GSOB attack, extensive growth of wound tissues attempted to compartmentalize damage inflicted by GSOB attack, and that production of this reaction wood appears to have exhausted stored carbohydrate reserves.



2. Sequential Aerial-Photoimagery - Cara Washington Graduate Student/Aerial Mapping Leader

This quarter we completed reviewing, analyzing, and correcting previous oak woodland vegetation map to account for difference in woodland identification. For all eight large-scale plots completed or nearing completion, average & median year of tree death, average & median year of 1st indication of canopy decline, and average & median year of tree entering irreparable decline preceding tree death have been recorded for all individuals within each sample.

25-hectare sub plots of Johnson Ranch, Thing Valley Ranch, and Ramona large-scale plot locations have been created to more closely relate to 10-35 hectare study sites noting average & median year of tree death, average & median year of 1st indication of canopy decline, and average & median year of tree entering irreparable decline preceding tree death.

Small plot mapping continues with 100 small woodland plot locations throughout central San Diego County that range in size from 10-25 hectares. Data collected from these sites includes average & median year of tree death, average & median year of 1st indication of canopy decline, and average & median year of tree entering irreparable decline preceding tree death.

We continue to collect data to analyze the contribution of soil, slope and other physical characteristics to GSOB-related oak mortality and morbidity. Data on the following variables has been collected for all 100 of the small woodland plot locations: slope, aspect, elevation, precipitation, and temperature; soil type, soil infiltration rates, depth to bedrock and parent material is still being collected for these sites. This information continues to be collected and analyzed to create a predictive model of areas or conditions that may encourage GSOB infestation.

3. *GSOB-Supporting Grant Application Awards*

- UCCE/UCR received notification this quarter that our grant application resulted in us being awarded funds from the Western States Competitive Grant process. These new funds will continue GSOB outreach and education efforts including maintaining the www.gsob.org website after the ARRA grant funds are expended. In addition, these funds will be used to enhance the GSOB Early Warning System “citizen scientist” program and maintain its effectiveness for two additional years. A total of just under \$300,000 of federal funds were approved and will be matched primarily through “in-kind” EWS volunteer hours, non-recoverable costs borne by UC and other sources.
- We also were awarded \$8,700 in a Renewable Resources Extension Act (RREA) Statewide Special Program grant. The grant will be used to conduct a demonstration of oak restoration planning and restoration implementation following an insect outbreak (GSOB in this case). A series of webinars will be conducted and web page/resource enhancements made relating to oak restoration at www.gsob.org.

4. *Local Government Agency Coordination*

- **Activities in Riverside County.** Distributed additional “GSOB/Don’t Move Firewood” posters and other informational material at the request of the county. There continues to be concern about non-local oak wood coming into the Idyllwild area.
- **Activities in San Bernardino County.** On October 6th, Tom Scott and Kevin Turner gave a GSOB presentation to the San Bernardino County Association of Governments (SANBAG), represented by various city managers and county personnel. We coordinated the delivery of additional “GSOB/Don’t Move Firewood” posters and other informational material to San Bernardino County. There continues to be concern about non-local oak wood coming into the San Bernardino Mountains area.

- **Activities Orange County.** Developed a network of contacts and provided them with “GSOB/Don’t Move Firewood” posters and other informational material.
- **Activities Los Angeles County.** Provided the LA County Foresters with “GSOB/Don’t Move Firewood” posters and other informational material.
- **Statewide:** Several of us from GSOB “team” attended both days of the 60th Annual Meeting of the California Forest Pest Council in November to keep GSOB at the forefront and to interact with persons of influence.

5. UCCE/UCR Field Trials and Demonstration Projects

Research Briefing and Assessment Meeting. On December, 15th, ARRA grant staff and Dr. Tom Scott participated in a meeting with U.S.F.S. and UC researchers and administrators on GSOB and oak pathology studies that are either ongoing or deemed to be needed in the near future.

Pesticide as a Barrier to the Emergence of Adult GSOB Study. This quarter began the tedious work of dissecting both the treated and untreated bolts with a radial arm saw to look for dead GSOB under the bark. It will take some time to complete this work and our final report on this initial study will not be completed until this process is done. Some of the pesticide companies whose products we tested have offered to conduct residue tests to determine the level of penetration into the bark of their products during our test. Tom Scott and I met this quarter with a representative from Bayer Corp. who manufactures Sevin, a product that has been shown to be effective in preventing GSOB attack by USFS researcher Tom Coleman and appeared to be successful in our test. We have also been in discussions with reps from other companies whose products were tested. As described in the frontispiece, we are in the process of setting up a 2012 study to build on what we learned in 2011 again with the assistance and support of USFS entomologist Sheri Smith and insights from USFS entomologist Brian Strom. Our tree service contractor, Green Tree Forestry was paid from the ARRA grant to assist with wood cutting, processing and hauling for the 2011 study.

Particle Size Study. Dr. Tom Coleman of the U.S.F.S. presented results from our collaborative study at the California Forest Pest Council meeting in November. The results indicate that 3” minus and smaller grinds effectively kill GSOB in infested wood. The demonstration of efficacy for 3” minus treatment has potential to save a lot of time and money versus the prescribed 1” and 2” minus standards that have heretofore been described in GSOB literature. No GSOB emerged from the 9” minus material that was tested either, but due to insufficient GSOB emergence from its corresponding controls, the results are not considered valid. We are evaluating whether or not to re-do the 9” minus test in 2012; the 2011 test took a great deal of coordination and logistical support and we will need to determine if there is sufficient demand for 9” minus material in markets to warrant another test.

6. *Early Warning System Update (Citizen Scientist Program) Kathie Carter – Coordinator*

With the start of 2012 comes some exciting news, the Smartphone application is in the final design stages. I am working closely with the programmer to finalize the drop down menus in the Tree Survey Form. Again this application will be available for agency personnel first and hopefully we will be able to expand and have this available for our Citizen Scientists in the field soon after. The Santa Rosa Plateau has requested some of our posters and brochures which were delivered to them early January. We have also talked about having a training meeting at the Santa Rosa Meeting Center for interested parties and to recruit new Citizen Scientists. I have several training meetings set up for the next couple of months to recruit more Citizen Scientists.

In keeping with our grant requirements to provide funding match, I am revising the Tree Survey Form to include volunteer mileage and time and any incidentals that are incurred such as batteries for their GPS or even purchasing a GPS for the purpose of this project. Although the volunteers will not physically get paid, reporting the time, mileage and incidentals that they incur when going into the field to do a survey. I will be sending out an email updating all of our Citizen Scientists about this added feature on the survey form. It is an important feature as our grant will match and keep track of this data. The scheduled start time for this to be in place and working is July 2012.

There is so much to do to keep all aspects of this project alive and moving forward at a steady pace. I have been making Power Presentations for our upcoming training meetings and putting together display material to better achieve our goal of informing and spreading the knowledge of the severity and impact the GSOB prospectively will have in California if not kept in check. With these training meetings we will be motivating people to come on board and become Citizen Scientists.

Goldspotted Oak Borer Education and Outreach Program– Jan Gonzales UCCE San Diego

During this reporting quarter, staff with the UC Cooperative Extension – San Diego office focused on the development of several projects to further education and outreach on the goldspotted oak borer. Our work continues to be strongly collaborative with our University, agency and community partners.

Accomplishments and Work In Progress

Workshops and Webinar

- Communicated with participants from the GSOB webinar answering follow up questions, additional information on resources and updates on the status of webinar recording.
- Provided CEU information to workshop participants and providers as needed.

Resource Materials and Distribution:

- Provided distribution of GSOB and firewood movement information and awareness materials.
 - Distributed 2,500 tri-fold brochures to City and County Parks and community partners.
 - Coordinated with San Diego Master Gardeners for GSOB and Don't Move Firewood information outreach at the Botanical Gardens in Balboa Park.
 - Coordinated and distributed Don't Move Firewood campaign Frisbees and playing cards.
- Coordinated with collaborators and staff to develop new public and internal resources and communications.
 - Met with M. Anderson (USFS) to discuss the development of a handout on community oak restoration.
 - Arranged for the printing of 20,000 additional tri-fold brochures.
 - Assisted K. Carter (UCR) with Early Warning System handouts and internal document sharing on the Collaborative Tools system.
 - Developing new internal systems for sharing and updating information from the online Public GSOB Symptoms Report. The objective is to communicate details of new entries and provide a method to record inspection results more accurately and more efficiently.
 - Reviewed and commented on letters regarding firewood management for Early Warning System volunteers and private landowners
 - Developing GSOB information packets with resource materials on GSOB threat and biology; firewood management; the Early Warning System program and other ways to become involved in limiting the spread of GSOB.
 - Researching and collecting contact information of private landowners of large acreage in GSOB impacted and at risk areas in Southern California counties.
 - Coordinating the creation of a new 4-page GSOB information pamphlet. Printed copies to be included in the information packet distribution and made available to cooperators for further use.
 - Coordinated with J. Alexander on postcard promoting the online version of the CFTF firewood survey to be included in information packets.

Firewood Survey

- Collaborated in the delivery, collection and processing of the CFTF firewood survey in San Diego County.
 - Collaborated with J. Alexander on data entry tool and process.
 - Coordinated with J. Alexander, M. Aguilera and R. Covalt on the distribution and collection of completed camper firewood surveys.
 - Provided status updates and began entering data from completed surveys.

Social Media:

- Continued development of social media and new communication methods.
 - Blog: drafted article on community preparedness plans; working to establish more efficient review and posting process.
 - Flickr: re-activated the GSOB Flickr account and drafting protocol to allow photo uploads by GSOB cooperators.

Other On-going Tasks:

- Continued work on video projects: editing footage, photos and drafting scripts.
- Participated in bi-weekly GSOB education and outreach workgroup conference calls and meetings.
- Continued monitoring online survey for Public Reporting of Suspected GSOB Symptoms; forwarded reports in new locations to researchers for follow-up.
- Continued monitoring and data collection of online GSOB news and mentions.
- Continued management of two GSOB Collaborative Tools groups used for internal communications and document sharing.
- Interfaced with public via phone and email on requests for GSOB information, resources, contacts and suspected infestation.
- Contributed, reviewed and locally distributed GSOB and ARRA grant reports.

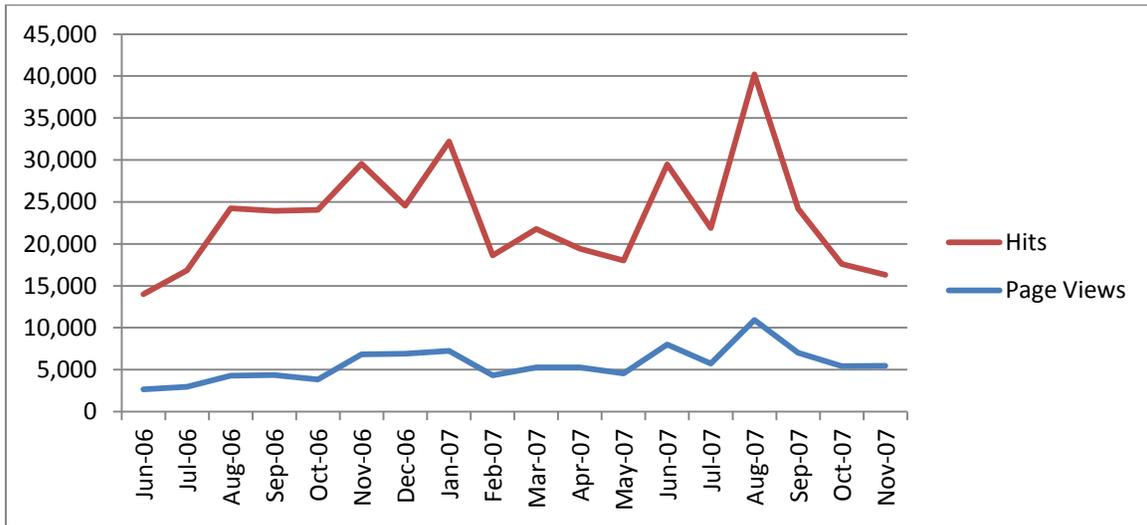
Website:

- Managed the GSOB website, email list and online reports.
 - Reviewed and updated links to photos and documents.
 - Sent e-Blast regarding local GSOB news and activities.
 - Drafted page updates and new pages.
 - Began review of online FAQ's.

GSOB website use data:

	Quarter (Oct-Dec 2011)	Cumulative (Sep09-Dec11)
Hits	40,242	430,114
Page Views	17,904	140,958

Monthly Activity Chart



Month	Hits	Page Views
Jul-10	11,318	2,663
Aug-10	13,900	2,951
Sep-10	19,938	4,292
Oct-10	19,563	4,382
Nov-10	20,233	3,825
Dec-10	22,699	6,840
Jan-11	17,606	6,923
Feb-11	24,946	7,261
Mar-11	14,284	4,321
Apr-11	16,494	5,273
May-11	14,150	5,275
Jun-11	13,482	4,550
Jul-11	21,445	8,013
Aug-11	16,135	5,735
Sep-11	29,285	10,919
Oct-11	17,195	7,018
Nov-11	12,181	5,430
Dec-11	10,866	5,456