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I have been contemplating recent geospatial news and activities that have caught my attention. Technology advancements have a huge impact on us as geospatial practitioners, and on our management’s expectation of what is possible.

The core geospatial data sets that are being captured and processed are amazing. A recent news bulletin heralded the successful launch of the world’s highest resolution, commercial Earth-imaging satellite. The advancements of LiDAR aircraft- and vehicle-based point cloud data capture techniques brings natural and man-made features to life in our GIS platforms. The resolution and accuracy of image acquisition continues to increase as does demand by end users. We are talking about massive data sets.

Conversely, the smart phone revolution forges ahead to place smaller, lighter, and faster technology capabilities in our hands. The numbers of smart phones being purchased is staggering. Smart phone technology supports a variety of social and business activities for users who want information, and want it now. Incorporate GPS and cell triangulation into the mix and the devices can know where we are and present what is around us. So, now we have massive data sets and ubiquitous handheld devices. What can we do with these divergent trends?

What we do with massive data sets and mobile technology is being influenced with the proliferation and use of digital maps and digital globes, public-facing web portals, and web mapping services. These sites are setting or impacting expectations by our management, elected officials, and the public on what is available and the ‘ease’ to find and use the information to solve our real-world business needs. Add to the mix the desire by organizations to make their enterprise knowledge more available to field employees, and perhaps the larger mobile community, and our challenges to operate and maintain enterprise geospatial solutions are exacerbated.

Are you ready to serve or consume massive data sets? Have you enabled mobile field staff? Have you considered how to make your geospatial information available to the smart phone community within or outside your organization? Perhaps this is an opportunity to enhance your skills to support these new and exciting technology trends.

On the subject of massive data sets, there are several initiatives in the geospatial world that are focused on implementing national framework themes with a goal of substantial nationwide savings. Imagery for the Nation (IFTN) reflects a vision that the nation will have a sustainable and flexible digital imagery program that meets the needs of local, state, regional, tribal and federal agencies. IFTN is well developed and actively promoted and Transportation for the Nation and Parcels for the Nation are in early stages of development and evaluation. We all look forward to seeing even more new developments and initiatives in these areas in the coming years.

What geospatial news and development are capturing your attention?

Ciao,

Malcolm Adkins
2008-09 BAAMA President
BAAMA is the vital organization of GIS professionals in the San Francisco Bay Region that promotes partnerships and teamwork with users of GIS technology to improve our environment and community. BAAMA is a proud chapter of the Urban and Regional Information Systems Association (URISA).

The mission of BAAMA is to be the primary forum of the San Francisco Bay Region geospatial community that provides education for professional development, networking opportunities, leadership, coordination, and representation — and have fun doing it!

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I am not a gamer. Like other geophysicists, my background in 3-dimensional data has emphasized the true solid volumes of the subsurface and structural geology much more than it has the graphic textured shells of video games and cinematic special effects. Yet in my experience with engineering field surveys, environmental site investigations, and exploration studies for resources or for science, 3D data visualization has always been a close companion of GIS.

As a GIS person I first became oriented to the online virtual world Second Life two years ago, and one of my first reactions to it was to imagine (re)building GIS data in an immersive 3D graphic context that had physics simulation for gravity, solid 3D geometry with user-defined lighting, and the ability to share the experience and communicate with others logged in to the (GIS-based) model at the same place in real time.

GIS-based Multi-User Virtual Environments (MUVE) are a new class of geospatial product that can be applied to uses like terrain visualization, geographically dispersed team collaboration, field project or urban land use planning, or field data publishing — all accessed as web services of dynamically streamed 3D graphic objects. In this context, GIS-based MUVEs are 3D models published in ways that support third-person visualization, so that one sees not only the rendering of the 3D model but also one’s own agent (a.k.a. avatar or character) in the context of that rendering near the user’s point of view. A MUVE’s multi-user aspect implies that in it, any users’ agent is visible in real time to other nearby users.

It’s been asked: “Who needs MUVEs?” I won’t presume to offer a complete list. In fact many who need MUVEs are already using them — many without much GIS connection. In this already-using-it category are remote technology or business teams who benefit from a shared 3D context for live discussions of a product design or process that is complex enough to benefit from augmenting a conference call with a shared, manipulable 3D version of the subject in question. A 1980’s genesis of proto-MUVEs was networked battlefield simulation.

In GIS, a MUVE is a means of publishing detailed 3D data of use to policy decision makers, economic development teams, land-use planners and architects, and public safety tactical training scenario builders. Some of these folks presently use 3D data to render fly-through movies in advance of a presentation. Pre-rendered fly-throughs are a 3D analog of a static 2D map product where end-users must cede control to the cartographer. In the 3D case, the end-user is ceding control to a cinematographer. Just as web map services let us publish GIS work in a form that can be browsed at will by the end-user, a MUVE provides a framework for publishing our 3D GIS content at up to floor-plan level of detail — where multiple end-users may navigate the model at their own will, while having some awareness of others nearby in the model who are exploring the same area.

MUVEs ON THE MOVE

Following 3D graphics technology advances over the past 15 years, MUVEs have grown more specialized in the applications they serve. The earliest and largest non-GIS commercial application is gaming and in particular, Massively Multiuser Online Role-Playing Games, or Metaverses. These are non-GIS MUVEs that offer social interaction, shared experiences and business relationships among players, users, or residents (see SecondLife.com for a local example). Paraverses are an umbrella term for Augmented Reality and Mirror World MUVEs. You might find your reality augmented by driving to work with a live traffic report map delivered to a smart phone browser (along with many other simultaneously augmented commuters). Mirror Worlds invert that scheme, as in modeling a 3D traffic jam in real time and allowing users to see the traffic however they chose: flying over like a traffic helicopter, stuck behind the wheel, or jumping to the best available model of the jam-causing crash in its actual location. For GIS-based public applications, it is the Mirror World paradigm that seems most relevant.
For the past two years, a certain mainstreaming of 3D graphic technologies has changed the way many people access both imagery and geospatial data as services. The expansive swath of data and ease of use that is Google Earth has brought user-controlled perspectives of terrain-draped orthoimagery to millions of eyes, and in turn motivated some of us to install 3D graphics display cards as well. Although both Google Earth and MS Virtual Earth have established data collections that could be a foundation of mirror worlds, neither client offers a third-person viewing experience. Users do not see themselves in the data represented by an agent and can not see or interact with the agents of others who are viewing the same data at the same time. Also, the scales most efficiently dealt with by Google Earth and MS Virtual Earth clients are those smaller than about 1:2000 out to whole-globe viewing. While these are a tremendous range of viewing scales, all these scales are somewhat smaller than those that fill everyday human experience; they are the scales of GIS more than those of human evolution.

A popular Metaverse created by a San-Francisco based company is published by Linden Lab. Linden’s Second Life Grid technology has been used to simulate many aspects of life. Users pay a monthly fee to lease a fractional share of simulator resources within the grid. Linden Lab manages the server grid, updates both client and server, and manages transactions and communications. Over 1,000,000 users can simultaneously access the grid, and on average, there are over 50,000 users connected at one time. Second Life is a Mirroring World where you can build, share, and sell virtual objects or experiences in a 3D virtual world that does not have game rules. The environment need not reflect any physical reality, nor do the agents, in an environment that encourages certain types of creativity and does not require information from GIS. Second Life servers. Although the source is in Microsoft’s C# language, many larger-scale users implement OpenSim servers in Linux using Mono. The iconic symbol associated with OpenSim is the hamsa or eye-in-hand symbol.

Second Life Open Grid Protocol describes a standard communication that can be used by heterogeneous simulator grids, including both Second Life and OpenSim.

OpenSim The Open Simulator project has created an open source adaptation of the basic server functionality of the Second Life servers. Although the source is in Microsoft’s C# language, many large-scale users implement OpenSim servers in Linux using Mono. The iconic symbol associated with OpenSim is a hippocampus.

Mono An open source project that has created a compatible environment for running the Microsoft dot-NET framework on any open source platform, mitigating Windows licensing. The icon for the Mono project is a stylized monkey head.

to rez This verb is used when describing user experience with MUVEs based on streaming solid geometry, where the virtual world is delivered on demand and network bandwidth may cause complex scenes to render, or resolve, while one waits. It sometimes refers to the first rez or virtual birth of one’s agent in a given MUVE.

GLOSSARY OF TERMS
Agent Also called Avatar or Character, this is an object, typically animated and possibly humanoid, that represents a user’s presence in a 3D environment.

MUVE Multi-User Virtual Environment, a 3D model that can be navigated in third-person, so that one’s presence in the model is represented by a visible agent that can be seen by others who are also present in the model at the same time and nearby location.

MMORPG Massively Multiuser Online Role-Playing Game, a mode of online game that is designed for a very large number of simultaneous users, who may play fictional roles in the context of a set of game rules. Presently, this may include realistic agents in a 3D MUVE.

Metaverse A mode of MUVE that supports large number of simultaneous users who may interact (or not), and is a 3D virtual world that does not have game rules. The environment need not reflect any physical reality, nor do the agents, in an environment that encourages certain types of creativity and does not require information from GIS.

Paraverse-Augmented Reality A false world mode of MUVE that provides large numbers of simultaneous users with model information to be consumed as a supplement to, or augmentation of, the real world. A limited example would be live traffic maps delivered to mobile clients stuck in a traffic jam.

Paraverse-Mirror World A false world mode of MUVE that allows multiple simultaneous users to experience presence in a recognizable analog of a portion of the real world. Users are represented by an agent that is visible to others present nearby at the same time and communication among the agents by text or voice is possible.

NURB Non-Uniform Rational B-spline is a mathematical basis for a smooth curve defined by a set of anchor points and tangents. A common example in computer graphics is the Bézier curve. Frequently these are one-dimensional curves in two-dimensional space, but they can be extended two-dimensional surfaces in three space, in a form called sculpted mesh.

Bumpmap A case of NURB that defines a grid-terrained, where single values of elevation are described over a two-dimensional area. In some MUVE clients, bump-maps describe a two-dimensional array of 24-bit RGB pixels mapped to describe [x,y,z] positions.

Second Life A popular commercial Metaverse with well over 10 million user accounts, or Residents. The Second Life grid technology stack includes a persistent shared 3D world of over 1,000 square kilometers, often over 50,000 simultaneous users, a physics engine for gravity and collisions, weather, and a functional in-world economy convertible to US Dollars. The icon for Second Life is the hamsa or eye-in-hand symbol.

SLOGP Second Life Open Grid Protocol describes a standard communication that can be used by heterogeneous simulator grids, including both Second Life and OpenSim.

OpenSim The Open Simulator project has created an open source adaptation of the basic server functionality of the Second Life servers. Although the source is in Microsoft’s C# language, many larger-scale users implement OpenSim servers in Linux using Mono. The iconic symbol associated with OpenSim is a hippocampus.

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CALIFORNIA BROADBAND TASK FORCE: MAPPING THE STATE OF CONNECTIVITY

BY MALCOLM ADKINS

“Much like our network of highways, broadband is a ubiquitous infrastructure that allows human capital to foster growth across the board and allows us to be the competitive leader worldwide in all sectors from education to healthcare and information delivery to economic delivery.”

With these words, the California Broadband Task Force (CBTF) launched an unprecedented statewide effort to assess and shape a high-speed Internet strategy that will digitally connect all Californians.

The CBTF was originally formed by California Governor Arnold Schwarzenegger’s Executive Order S-23-06, “Twenty-First Century Government: Expanding Broadband Access and Usage in California” in fall 2006. Within this Executive Order, Governor Schwarzenegger commissioned the CBTF to “remove barriers to broadband access, identify opportunities for increased broadband adoption, and enable the creation and deployment of new advanced communication technologies.” The governor also requested that the CBTF “pay particular attention to how broadband can be used to substantially benefit educational institutions, healthcare institutions, community-based organizations, and governmental institutions.”

Sunne Wright McPeak, President and CEO of the California Emerging Technology Fund (CeTF) and member of the Governor’s Task Force, said, “Our challenge was to assess availability and access of broadband to the state’s 37 million residents — and then create a framework to bring the technology to all regions and all ethnic, age and income groups, in effect to bring broadband to everyone — to turn the “digital divide” into a “digital opportunity.”

SHAPING THE VISION

In forming the CBTF, the governor sought diversity in thought, expertise, and, most importantly, vision. The governor’s Task Force included 21 representatives with widely varying beliefs on the level of broadband availability from a number of local and state governments, non-profit organizations, foundations, the legislature, rural and urban organizations, research institutions and even broadband application developers.

“Increasing both access to and use of broadband will build economic capital, strengthen public safety resources, improve living standards, expand educational and healthcare opportunities, and raise the levels of civic engagement and governmental transparency,” explains McPeak. “The state must seize the opportunity to promote private-sector investment and leverage public private partnerships to increase broadband availability and adoption.”

LEVERAGING CAPITAL

The formation of the CBTF coincided with the California Public Utilities Commission’s (PUC) approval of recent telecommunications mergers. In turn, the PUC required the surviving companies to collectively provide $60 million in shareholder contributions to the fund over the next five years to establish the California Emerging Technology Fund, based in San Francisco.

The CeTF’s 12-member governing board — chosen by the PUC, telecommunications members and the board itself — has the job of extending Internet broadband services to underrepresented communities in rural and urban California.

McPeak recalls, “It was a perfect confluence of events. The governor’s announcement of the Task Force and its charge to put together a plan of action for California, coupled with the capitalization of the CeTF meant that the CeTF, as a not-for-profit organization, was able to support the Task Force agenda.”

The CeTF’s goal is to leverage the $60 million initial investment at least four fold, providing closer to $240 million to help close the digital divide. As a first step, the governor’s Task Force needed a clear understanding of the current state of broadband across the state, namely availability, adoption and application.

SPHERES OF INFLUENCE

The CeTF, on behalf of the CBTF, retained Michael Baker Jr., Inc., Oakland CA, as the mapping consultant to assemble a comprehensive, up-to-date map of statewide broadband availability that would serve as a guideline for policies that will positively influence broadband availability and adoption. The CBTF faced several major performance hurdles including ensuring the security of sensitive business and user information, determining the quality of the data to be collected, and determining the time and resources needed to collect, compile, and analyze the data.

Working with CBTF and using state-of-the-art techniques and technologies, Baker defined a project methodology to collect, load, and integrate data about broadband availability and use from all broadband providers in the state. Key in this effort was the introduction of an outreach program for telephone and cable broadband providers that would ensure the security of sensitive broadband customer data in a highly competitive market.

With appropriate agreements in place, Baker developed an environment where the broadband providers could deliver sensitive data securely to Baker. The magnitude of the data that was going to be collected was unknown by all parties, as an address-based analysis had never been performed.

Malcolm Adkins, Director of Baker’s Geospatial Information Technology (GIT) explains, “Ultimately, we gathered over 15.7
million address-based points and boundary extents that equated to approximately another 8 million addresses. Broadband providers delivered data on where they could serve, not just who they do serve, and the corresponding combined upstream/downstream speed to provide the best map-based assessment of broadband availability.” Providers delivered their source information as discrete address points (parsed- or concatenated-address field format), as polygonal boundaries provided they were at the city block or smaller extent, and even as boundaries delineated on paper maps to enable some of the smaller providers to participate in the program.

Baker loaded and aggregated all the source data and reported to CETF on the quality of the source data and geocoding match rates. Analysis of the massive amount of data revealed that by applying a one-kilometer by one-kilometer grid across the state, CBTF could depict broadband availability by speed tier (a combined upstream/downstream data flow rate) in sufficient detail to make informed broadband decisions while protecting the confidential data. With a grid in place, Baker incorporated other techniques into its broadband analysis to mask large water bodies and barren terrain where services would not be expected.

The final raster grid dataset delivered to the CBTF included an interim map of broadband availability throughout the state sorted by broadband speed. The map product was unspecific to broadband technologies, providers, and/or addresses. U.S. Census housing units and household information was then layered on top of the broadband speed map to help identify those communities with limited or no broadband access. Mike Byrne with the California Department of Public Health, says, “This is so much more than a traditional political map of the state. People hear the word map and they think it sits on a shelf and you use it for reference when you want to make a trip. That’s not the case with the statewide broadband availability map. This is a dynamic, interactive, functional resource that will drive all future programs to expand broadband throughout the state.”

Final statewide and regional map products and supporting broadband availability statistics were developed and presented to the CBTF to author the final report. Robert Hanson, Senior Vice President, of Baker Geospatial Information Technology observes, Ultimately, broadband technology reveals itself as another segment of “critical infrastructure.” Its advent can be put into perspective by tracing civilization’s migration from huddling around sources of water, creating footpaths between these sources that tied communities together. These advancements led to boats, carts, rail, and eventually to electrification of not only surface and air transportation, but of communications. Broadband has become an essential infrastructure to economic development.

**HIGH-SPEED DIRECTIONS**

After detailed analysis of the broadband map, coupled with independent research, CBTF determined that California is better positioned than most states on broadband availability and adoption, yet lags behind key foreign competitors. Specifically, and perhaps surprisingly to many CBTF members and readers of the report, the map analysis indicated that:

- **96%** of California residences have access to broadband.
- **1.4** million mostly rural Californians lack broadband access at any speed.
- Barely more than half of Californians use broadband at home.
- **Only half of Californians have access to broadband at speeds greater than 10 Mbps (including both upstream and downstream speeds).**

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We city-dwellers in the San Francisco Bay Area are blessed with hillside green spaces surrounding our urban communities. Many of these forests are facing an epidemic called Sudden Oak Death. Have you ever driven along 101 in Marin and Sonoma Counties, or on 280 down the San Francisco Peninsula, or through the east bay parkland, and wondered about the orange and brown canopies of the oak and tanoak trees in Bay Area hills? You may have seen this Sudden Oak Death (SOD), and have wanted to report it. You are not alone. A new system for mapping allows you to help map SOD in the Bay Area by submitting your sighting online!

Since the mid-1990s, SOD, caused by Phytophthora ramorum, has caused substantial death in tanoak trees and several oak tree species (coast live oak, California black oak, Shreve oak, and canyon live oak), as well as twig and foliar diseases in numerous other plant species, including California bay laurel, Douglas-fir, and coast redwood. In California, where SOD has been evident the longest, epidemic dieback of tanoaks, coast live oaks, and black oaks occurs in large patches along the coast, presenting serious threats to the ecology, wildlife habitat, soil erosion properties, fire regime, and the aesthetic value of thousands of hectares of forest (Rizzo et al. 2003). Although the first P. ramorum-infested California nursery stock was identified in 2001 (in Santa Cruz County), the U.S. nursery industry was not widely impacted by the disease until 2003, when the pathogen was detected in California, Oregon, Washington, and British Columbia nurseries. Currently it’s regulated at county, state, and federal levels.

Public interest in SOD remains high as it continues to spread and impact more areas. Early in the infestation, information from active members of the public was key in locating new areas of infestation across the state. The California Oak Mortality Task Force, arborists, and university researchers were repeatedly contacted with reports of new areas of suspected infestations. In response to this concern from the public, we created a website in 2001 where visitors could submit the locations of trees that were potentially infected. This site, OakMapper (www.oakmapper.org), has had thousands of visitors, who have submitted hundreds of point locations of trees suspected of having the disease. In addition to this functionality, over time the first version of the OakMapper served as a clearinghouse for four SOD-related, spatial resources: 1) Google Maps, 2) Google Earth, 3) ESRI ArcIMS, and 4) static maps. The OakMapper webGIS application is our comprehensive database and cartographic portal, containing all SOD data available for public viewing. However, all of these resources were dependent upon a project administrator to manually update their source data and reload the content to the web site on a quarterly basis.

In October 2008, we launched the second version of our webGIS, OakMapper 2.0, offering a more dynamic, customizable, and user-driven cartographic environment that is built on a combination of open-source and proprietary software. OakMapper 2.0 allows user-specific interactions — including scale-dependent zooming, customized map creation, hyperlinked photography, and querying functions — using the spatial database PostGIS. Users can report trees that might have the disease so that follow-up sampling can take place.

The development of web-based efforts continues to prove effective in communicating SOD information to researchers, regulators, and the general public by providing a readily available avenue for viewing, searching, querying, and exporting data and maps. The ultimate goal of OakMapper 2.0 is to empower stakeholders to participate in disease monitoring. To this end, the application is designed with non-GIS experts in mind. An online form is used to gather reports of potential SOD sightings by allowing users to:

1. Select a host and visible SOD symptoms (chosen from pictures and explanations that aid in identification),

The OakMapper webGIS site, showing GIS database of disease distribution. The site allows customizable map production, user interaction with the database, and public submission of monitoring data.
2. Enter information about their professional background, and
3. Submit the location of the tree (i.e., GPS coordinates, addresses, or location on map). The numerous submissions to date have demonstrated the success of citizen-generated data in widening the sampling effort for this disease.

A SINGLE DATABASE
OakMapper 2.0 integrates the features of OakMapper 1.0 into one package and then further extends to other new features. As new open-source tools became available, we were interested in migrating to these more flexible solutions. The migration process begins with consolidating disparate data storage formats and sources, such as shapefile, MS Access, and Excel, into a single format and data source, the open-source database PostgreSQL, with the spatial extension PostGIS. PostGIS, which is an open-source spatial database, allows us to perform spatial data query and analysis. (Currently, OakMapper 2.0 is not utilizing the full features of PostGIS; this is set for future development.)

DYNAMIC DATA AND MAP GENERATION
OakMapper 1.0 had four distinct and primary components: static maps, ESRI ArcIMS, Google Maps Application Programming Interface (API), and Google Earth KML/KMZ. The front page of OakMapper 1.0 functioned as a portal web page for each of these four components. As a result, there was no navigation and interaction between these four components within the OakMapper 1.0 site. OakMapper 2.0 first integrates these four components by providing a navigation menu at the top. The navigation system allows users to travel back and forth among these components easily and provides a consistent feel and experience throughout the site. OakMapper 2.0 also allows different components to interact with one another. For example, the static maps can be selected for download using the Google Maps API download tool. Also, when you submit a point to the system via the Google Maps API, the Google Earth KML data file will be automatically updated.

GEOGRAPHIC SUBMISSION
OakMapper 2.0 allows any user to come to the system and submit new findings of Sudden Oak Death to the database. A user-centered design philosophy was implemented to achieve ease of use for end users. When reporting a suspected case of SOD, users simply 1) draw a point or polygon on the Google Map, and 2) enter relevant information, such as descriptions and pictures about the new finding of SOD. This easy-to-use system is built to encourage community participation in recording more SOD occurrences, so that spread can be tracked more efficiently. And given that users’ submissions are open to the general public, the public can be alerted about the new occurrences of SOD. The most recent SOD submissions will be displayed on the homepage, so that users can view the most recent activity on the site. The interaction between these features is enabled by their shared database.

USER REGISTRATION AND COMMENTS
OakMapper 2.0 allows users to register into the system so that they can keep track of their SOD submissions. Given that users might want to modify the descriptions or other information of their SOD submissions, registered users are provided with tools to edit their submissions. Registered users can also provide comments to SOD submissions. The commenting features of OakMapper 2.0 will facilitate more information generation and community building. Users can comment on the severity of SOD submissions. Like the submissions of SOD, users can keep track of and edit their submitted comments in the “My Account” section.

EMAIL CONFIRMATION
To improve the system’s responsiveness to users’ activities on the OakMapper 2.0 site, the system sends a confirmation email to the users when they register and when they submit an observation of SOD. The confirmation email will also contain the most recent SOD submissions and the most recent comments, which link back to OakMapper 2.0 for further exploration. Future ideas include improving the email functionality to enable sharing capability, i.e. to email a SOD point/polygon to a friend who lives near the area.

GEORSS SUBSCRIPTION
RSS feed is a familiar tool in the Web 2.0 world. The GeoRSS standard provides a way to integrate RSS feeds with location information. OakMapper 2.0 generates GeoRSS feeds so that feed readers with spatial awareness can take advantage of the RSS feed of SOD submissions. The standard GeoRSS format allows the SOD data to be integrated with other web-map mashup applications.

DYNAMICALLY UPDATED WEGBIS
OakMapper serves as an important resource for researchers to access the most up-to-date maps of confirmed cases of SOD. OakMapper 2.0 improves on our former model of providing PDFs for download and distributing shapefiles via e-mail by allowing users to export maps to their preferred format. The application is built on ESRI ArcGIS Server and utilizes ArcSDE to reference the PostGIS spatial database to display the most up-to-date data available. This new structure ensures that users have access to all confirmed points and frees the site administrator from manually creating dozens of static maps.

WE NEED YOUR HELP! WHAT YOU CAN DO?
The official map of Sudden Oak Death in California shows only a few hundred individual trees with the disease. This is because of the time and expense in officially confirming the presence of _P. ramorum_: the California Department of Food and Agriculture and the University of California perform this confirmation process on all samples collected statewide. This map of individual trees doesn’t show the complete extent of oak mortality statewide, and we are interested in getting public help in mapping other pockets of oak mortality that are not shown on the official map. Not
all of these areas can or will be officially confirmed to have the disease, but we are interested in further defining where oak mortality exists, with your help. For example, there are many clusters of oak mortality in the East Bay Regional Parks that have not yet been mapped (see image at right). OakMapper 2.0 can help. We’d like you to use this tool to map areas where you see pockets of oak mortality that might be connected to Sudden Oak Death. We hope this model of data acquisition, storage, analysis, and dissemination will be more widely used in forest health management in particular and natural resource management in general. We would happily entertain communications with others developing or who have developed similar comprehensive geospatial informatics programs for natural resource problem solving.

REFERENCES

ABOUT THE AUTHORS
Maggi Kelly is a professor in the Department of Environmental Sciences, Policy and Management (ESPM), University of California, Berkeley. John Connors is a Staff Researcher in the ESPM Department. Shufei Lei is a PhD Student in the ESPM Department.

BROADBAND TASK FORCE
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Broadband infrastructure is deployed unevenly throughout the state, from state-of-the-art to nonexistent.

The CBTF mapping initiative, along with additional supporting studies and literature, further indicate that the state should focus on three primary consumer areas: rural and remote areas not served at all by the infrastructure; disadvantaged urban neighborhoods where the infrastructure may exist but residents are not able to use, afford or access the technology; and individuals with disabilities.

With this in mind, the CBTF set forth strategies to address each of these areas of concern.

Thus far, at the direction of the Task Force, the CETF has committed about one-third of its initial investment capital of $60 million and has made investments in rural demand aggregation, investments in applications in urban areas and partnered with the organizations that serve and represent people with disabilities.

CETF’s McPeak confirms, “We are partnering with other organizations, principally the Children’s Partnership, to look at getting computers into the hands and homes of all middle school students in California of low income, in low performing schools, so that whole generations of users do not get left behind.”

CONTINUING ADVOCACY
While the CBTF has completed its mission to assess statewide broadband availability, adoption and access, the members remain active advocates in the process, helping generate support for broadband initiative.

Governor Schwarzenegger recently announced a $22 million grant award to the California Telehealth Network by the Federal Communications Commission. Telehealth is a health care services initiative designed to bring health care advice and tips to patients and families through television.

The California Public Utilities Commission (CPUC) allocated $100 million over two years to the new California Advanced Services Fund (CASF), which will provide incentives to companies to bring broadband service to un-served and underserved areas of California, many of which are rural, remote, or socioeconomically disadvantaged communities.

The Final Report of the Broadband Task Force, including maps, was released in January 2008 and is available on the CBTF website: www.calink.ca.gov.

ABOUT THE AUTHOR
Malcolm Adkins is Director of Baker’s Geospatial Information Technology (GIT) service area, and the current BAAMA President.
server and client software, provides real-time physics simulation and a secure environment with a real economy in the virtual world in support of both collaboration and innovation. Pricing is geared towards users who might open a virtual office, retail store, or nightclub; but is not feasible for the 1:1 scale simulation of entire cities. Still, three factors align to make Linden Lab technology very relevant to GIS: LibSecondLife, the release by Linden Lab of the Second Life client as open source, and the founding of the OpenSimulator project.

In mid-2006, a group of developers engineered an imitation of the protocol by which Second Life clients communicate with Second Life servers, resulting in a programmer’s library of components called LibSecondLife. In January 2007, Linden Lab opened the source for the Second Life client. Soon afterward, developers created protocol-compatible imitations of Second Life server functionality, which is what the OpenSimulator (OpenSim) project has done since early 2007. Since early 2008, Linden Lab has been drafting the Second Life Open Grid Protocol to support interoperability between the commercial Second Life Grid and external grids including those built with OpenSim. In August and September 2008, Linden Lab tested a version of the Second Life client that supports Second Life Open Grid Protocol (SLOGP) and allows agents logged in to one grid to "teleport" among heterogeneous SLOGP-enabled grids.

That bit of history might be summed up as OpenSim is growing into server technology that will likely be the first to support simulation of entire cities within city budgets, and SLOGP-compatible grids demonstrate that OpenSim-based civic Mirror Worlds might one day interoperate.

THREE THINGS TO DO WITH YOUR OWN VIRTUAL WORLD

With control of your own MUVE system, the GIS experience differs from a bumpy globe. Rather than viewing GIS data from your own first-person perspective as on a globe, it becomes possible to experience much of that same GIS data in an immersive third-person perspective, where you can see your agent experiencing the data through a 3D perspective projection of your choosing. You can also see your agent together with agents of others who are visiting the same place in the environment at the same moment. Each user is represented by their own agent with freedom to move to a chosen position and each user also chooses their own viewing perspective independent of their agent’s position. This is immersion, a key sense of what distinguishes an “Immersive 3D” environment from a 2-1/2D bumpy globe.

In other words, you could go into your map and walk around there with other people who had also gone into the map with you. At a minimum you would be able to instant-message one another. In some cases you also have a voice-over-IP audio connection to augment your shared login to this shared virtual environment that may be defined by GIS data. Don’t ignore this: a MUVE can be a lot more fun for all involved than looking at a globe when someone else is driving the viewer, and in the long run, fun matters because it can produce better collaboration. With that background, there are three categories of MUVE publishing of GIS data that I’d like to summarize for your consideration.

For a Level 1 build, one must have gridded terrain data (a.k.a. digital elevation model or DEM) and an ability to resample data so that it can be loaded into the simulator where it will be interpreted as 1-meter postings. Moderate familiarity with and access to ERDAS Imagine would allow one to avoid any custom programming; larger regions would benefit from ERDAS scripting. For a simulator machine running OpenSim, some have used Visual

MarinMap is a consortium of public agencies (local governments and special districts) dedicated to building and sharing a geographic information system (GIS), cooperating to improve each agency’s business processes, improving public service and providing a forum for collaborative decision making. MarinMap operates an Internet-accessible GIS and spatial data download site, bringing the best available information to the public via the Internet.

Current projects include building a comprehensive data viewer, mapping storm water systems, refining hydrology data for protecting watersheds, linking images and official record maps with GIS data, and mapping monuments and benchmarks.

Visit MarinMap at http://www.marinmap.org
Studio 2005 Express C# (C-sharp) edition on Windows, particularly for testing. Dedicated OpenSim machines and most larger grids use Linux to eliminate operating system licensing cost. With moderate Linux experience available, an Ubuntu 8.04 (Long-term-service) OS can be installed and configured with OpenSim in about one hour. This creates a walkable GIS-based terrain.

For a Level 2 build, both orthoimagery and a LiDAR point cloud were available in addition to the gridded terrain. An uncommon (to GIS) image data type—a bumpmap—was generated using ERDAS Imagine scripting and Adobe Photoshop batch conversion. Bumpmaps are extremely versatile and well-handled in Autodesk Maya; for GIS applications a very specific subclass of bumpmaps, a regularly gridded mesh, was used. To simulate an entire city, it would be worth some custom programming to generate the features that fill the simulation. This creates a full-scale placeholder for a Mirror World, where building and tree mass are accurately positioned and height-scaled, real lines of sight work, but imagery is far better on rooftop and ground surface than along the sides of the structures. Using ERDAS scripting, some 10 hours to 15 hours per real-world square kilometer was expended in proof-of-concept.

For a Level 3 build, effort focused on a photorealistic true-scale model of building exterior and interior, where solid geometry objects have real-world image textures on their surfaces. Scaling up this proof-of-concept to larger extent requires a balance of available building models with the desired simulator publishing technology. At this time, it appears that COLLADA will be the standard format through which 3D designs can be aggregated into a Mirror World, whether the source model is from Autodesk Maya, Google SketchUp, Blender, or others. Building exteriors might be compiled at a civic scale with technologies such as Earthmine.com, that provide both a georeferenced 3D mesh and building face texture images from street level. Building interiors will require floor plans at a minimum, and access to the interior to obtain accurate texture images. All internal and exterior data must be scaled and integrated in a unified georeferenced model. A Mirror World this realistic would be instantly recognizable to those who know the real-world site, and would thus be capable of replacing many maps and some field visits. With no building models to import, and by creating content at real-world scale using the Second Life client built-in tools, about 500 hours per real-world square kilometer of a business district were expended in proof-of-concept.
Level 1, plain terrain at around 1:10 scale, is the cheapest and easiest starting point for immersive 3D modeling of most sites in the continental US, as terrain is freely available at 10-meter postings from http://seamless.usgs.gov and is not too difficult to get into a MUVE. Screen-shot examples show real-world terrain put into a MUVE at between 1:25 and 1:4 scale, depending on the area of interest and the area available for publishing the terrain in a MUVE. For a bit more realism, some horizontal surfaces have been placed in these terrains, either to display orthoimagery as a graphic texture on the 3D object, or as an ambient water surface.

Level 2, a raster model of an urbanized area at 1:1 scale, is a 3D technique for creating a quick model of a life-sized Mirror World-type Paraverse. An orthophoto is simply draped over first-return LiDAR data that has been tesselated then gridded to create a roof-and-trees surface. Representing these data in a MUVE involved some technical development and an interesting graphic object type defined using a bump-map. This approach is not too satisfying at first glance. Its trees have been described as melting and orthoimagery of roof features often dribble down the sides of buildings. But the base information is quite strong, and the building positions and scales, along with the canopy and mass of trees are precisely rendered. This is a preferred approach for a first build-out of a Mirror World, as the effort is moderate and the result is a very complete initial volume for every building and large tree. As more detailed 3D models (see next section) are built and made available, the LiDAR raster can be flattened out and replaced with more precise vector models of specific buildings.

Level 3, a full-stop detailed model of building exteriors, interiors, and subsurface spaces, unlike the quick and droopy but very complete raster model technique, this is a vector model where content is either imported from an existing 3D design or hand-crafted from the graphic primitives available in the Second Life Grid technology. As above, representing these data in the MUVE involved some technical development and interesting graphic object types, as well as a lot of site visits to capture good-quality imagery for textures. The proof-of-concept shown in the images was built on the Second Life main grid, named Agni, and can be visited by any resident of Second Life in the region named Gualala. To save monthly costs by a factor of 1/9, the vector object construction or “build” was created at 1/3 scale. The purpose of the proof-of-concept was to show what level of realism might be achieved using Second Life Grid technology for a Mirror World application.

The practical application of this vector build would be to replace the raster model above at selected locations as more detailed plans or 3D models became available. Of course, the intention would be to do this work in OpenSim at 1:1 scale, where the benefits of full-size construction can be enjoyed with very little marginal cost for the full-size space required in the virtual world simulator.

**SO WHAT DOES IT TAKE?**

For those GIS practitioners who have become conversant with open source options for doing GIS work, the threshold for standing up an OpenSim MUVE is exceedingly low. For an Ubuntu Linux user, the steps needed for standing up a single 256-meter square OpenSim region with default terrain (an appealingly hemispherical island) take just a half-dozen command lines and might be completed in 15 minutes.

For those who are most comfortable with MS Windows, or who wish to explore just a 256-meter square region or two, OpenSim has been written so that it can be compiled using the free Visual C# 2005 Express Edition, and there is a solution file to automate the build.

If newer hardware is available, doing everything in a 64-bit Ubuntu environment involves about ten steps and might take an hour, but then be suitable for 40 or more regions (2-1/2 square kilometers) on a single server. The extra effort involves local 64-bit optimized builds of Mono (open source .NET development framework for multiple platforms), Open Dynamics Engine (an OpenSim alternative to the Havok physics engine used in Second Life), and the MySQL relational database (an option for resource storage available to OpenSim).
Getting the GIS data into an available OpenSim for a Level 1 build can be done with Leica Geosystems’ ERDAS Imagine, where DEM values are resampled to a 1-meter posting interval at the chosen simulator scale. For example, a 1:4 model has single-precision floating-point terrain values on a 4-meter posting interval that are loaded into the simulator as 1-meter data.

Taking LiDAR and orthoimagery into OpenSim for a Level 2 build can be done with ERDAS Imagine used to process the Z-values for bumpmaps, and a simple spreadsheet with formulas can be used to create the X- and Y-values. ERDAS Imagine can stack the x, y, and z layers. Adobe Photoshop is one option for exporting the resulting bumpmap into TARGA image file format for loading into an OpenSim sculpted mesh object.

Creating a large complex build using only the Second Life client program’s built-in tools is a chore that requires patience. Import scripts can speed the process if a 3D scaled model exists already, although often the import process is inefficient versus a hand-designed equivalent. Because MUVE technology may be streaming the 3D solid geometry objects to the client, the efficiency of the import process matters both for server storage resources and for the responsiveness of the user experience. Many online free training videos are available to explain how to build Second Life content.

WHERE CAN I VISIT THIS STUFF?

The Level 3 pilot project is a 1:3 scale miniature model of the Berkeley BART station named “Berkurodam” that has existed on public-facing Second Life servers since early 2007, so that anyone with a broadband network connection and a GIS workstation with 3D graphics card and meets these specs:

- You can download the most recent Second Life client for Windows, Mac OS, or Linux from http://secondlife.com/support/downloads.php. Then install the program and create a free Second Life “Resident” account, which has a first and last name.

I hope to visit with you in-world, soon!

ACKNOWLEDGEMENTS

Thanks to the editorial crew at BAAMA Journal for many helpful comments. The LiDAR data used in the Second type case study were collected for County of Alameda and provided through the help of Michael Munk in Community Development Agency and Rohin Saleh in Public Works Agency. LiDAR data suitability was assessed with help from the UC Berkeley Geospatial Innovation Facility, in particular Prof. Maggi Kelly and researcher Marek Jakubowski.
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Are you already a BAAMA member who’d like to get a little more involved? BAAMA welcomes members to take volunteer roles in the organization’s activities!

There are many reasons to be a BAAMA volunteer. First, you can learn something new. Perhaps you’ve never written a journal article before, but would like the chance to do so and to see your name in print. Now is the time to volunteer with the BAAMA Journal! Second, volunteering for BAAMA will increase your professional toolbox and enhance your resume. Add something to your repertoire that you might not normally do at your job! Third, if you volunteer, you will get to better know your fellow BAAMA members and board members. Who knows? Your next business partnership, project, or job might be the result of BAAMA networking!

There are several different BAAMA tasks that need volunteers, including our bi-monthly educational sessions, our semi-annual journal, and our communication and outreach via email and the web.

Volunteer for an educational session! We are always looking for people to give a presentation, or help to find presenters for a bi-monthly educational session. See page 19 for a list of upcoming educational sessions!

The BAAMA Journal, our semi-annual publication, needs writers, editors, and designers for the next issue! Write an article, or interview someone for an article! Or edit an article someone else has written! Help find advertisers for the Journal!

Assist with our BAAMA communications! Currently, our wonderful and talented volunteers include Michael Loconte as our email manager, Pascal Akl as our webmaster, Justin Anderson as our database administrator, and Christine Bush as our podcaster. These folks need back-ups for those busier times!

All BAAMA members are welcome to attend board meetings. As a board meeting attendee and BAAMA volunteer, you will become a member of BAAMA’s Advisory Board. After consistently attending several board meetings and volunteering some time (e.g. helping with an educational session, writing a Journal article, etc.), you can become a full Board Member, if you wish! As a Board Member, you can influence the directions and initiatives of BAAMA, easily network with numerous BAAMA members, and have a lot of fun doing it. If you would like to get involved, please contact a BAAMA board member — see our contact information at www.BAAAMA.org.

**ANNOUNCING THE 2009 BAAMA EDUCATION AWARD!**
BAAMA is proud to announce their 2009 Education Award! The BAAMA Education Award is designed to support and encourage higher education students who use GIS technology, both as a major field of study or as a specialized tool to support other degree or certificate goals.

We are proud to offer the following awards:
- 1st Prize of $2,500
- 2nd Prize of $1,500
- 3rd Prize of $1,000

There are four competition categories:
- **WEB APPLICATION** Websites for all competition entries must be active through April 2009.
- **POSTER** Poster that tells a geographic story and summarizes a work or project.
- **MAP** Map that tells a geographic story and summarizes a work or project.
- **OTHER GIS-related business application.**

Deadline: February 13th, 2009
Winners will be announced in the Spring 2009 issue of the BAAMA Journal and at CalGIS 2009!
Application and eligibility information are available at www.BAAAMA.org.
GIS EDUCATION AROUND THE BAY AREA: SAN FRANCISCO STATE UNIVERSITY AND THE INSTITUTE FOR GEOGRAPHIC INFORMATION SCIENCE

BY JERRY DAVIS, BARRY NICKEL & ANNE MCTAVISH

Have you ever been hiking, backpacking, or mountain biking in the many parks, forests, and wilderness areas of California? Then perhaps you have used a Tom Harrison Map, a well-known SFSU Geography alumnus who produces popular full-color, shaded-relief topographic maps of significant natural areas in California. Have you ever looked over an official San Francisco Street & Transit Map at a MUNI bus stop shelter or train station? Then you might thank Cartographics, a cartographic production firm also started by an SFSU Geography alumnus. San Francisco State University (SFSU) has a long history in the cartographic industry, teaching cartography since the 1920s, and geographic information science, teaching remote sensing since the 1960s and GIS since the 1980s. Since the earliest days of the university, SFSU faculty, staff, and students have stayed on the forefront of the influential Bay Area cartographic and geospatial industry.

ACADEMIC DEGREE PROGRAMS AND TRAINING

Each year the Department of Geography and Human Environmental Studies (http://bss.sfsu.edu/geog/) at SFSU contributes skilled graduates to a growing geospatial workforce through Bachelor’s and Master’s degrees in Geography. Students can focus in GIScience with classes such as Geographic Techniques, Introduction to Geographic Information Analysis, Cartography, Remote Sensing, Geographic Information Systems (Advanced), and GIS for Environmental Analysis. Other courses, such as Field Methods in Physical Geography and Watershed Assessment and Restoration integrate field data collection and mapping. These courses serve students in many academic programs, including Biology, Environmental Studies, Geology, Business, and Urban Studies. Responding to demand from students and academics, the department is currently proposing a Master of Science in Geographic Information Science.

Geography alumni from SFSU currently serve as GIS, cartography and remote sensing specialists in many private firms and local, regional, state and federal agencies. SFSU alumni hold important positions in government agencies, including the U.S. Bureau of Reclamation, California Department of Fish and Game, Caltrans, California Department of Forestry, the San Francisco Bay Regional Water Quality Control Board, the San Francisco Planning Department and SF Department of Public Works. SFSU alumni and interns can also be found at NGOs and private firms such as San Francisco Estuary Institute and PG&E. Classes provided these students with real-world skills they could use after graduation; internships helped them launch their careers. As community colleges are moving into GIS, SFSU’s alumni are also providing leadership, teaching GIS classes from Shasta College, to American River College, to City College of San Francisco and College of Marin.

Responding to the needs of the university and working professionals outside degree programs, the Institute for Geographic Information Science (IGISc) was started in 1988 as the center of geospatial activity at SFSU. The IGISc works at the intersection of the social, natural, and information sciences, and is actively engaged in research programs with public and private agencies, non-profit organizations, academic institutions, and individuals. IGISc also maintains site licenses and support for geospatial software across the entire CSU system, facilitates geospatial data access, and offers an established training program including workshops, symposia, specialized contract trainings and a Professional Development Certificate program in GIScience.

Established in 1994, the Professional Development Certificate program provides students with broad exposure to geospatial techniques, technology, and analysis. Classes are conducted as two-day intensive courses taught and developed by geospatial experts, all of whom have considerable practical experience in the field. Students completing the program are well-versed in GIScience theory and its practical application, with skills reflecting those needed by GIS professionals. The program’s rich array of 20 course offerings (see http://gis.sfsu.edu/cert/courses.htm) includes core and elective classes.

RESEARCH AGENDAS AND SPECIALIZATIONS

Through the many university centers, institutes and special programs at SF State, faculty, staff and students continue to focus on applying state-of-the-art information technology to pressing interdisciplinary data, information, and research. GIScience at SFSU can be found across many departments at its main campus near Lake Merced, at the SFSU Downtown Center, at the Public Research Institute, at the Cesar Chavez Institute, at the Institute for Analytic Journalism, at the Romberg Tiburon Center for Environmental Studies, and even at the Sierra Nevada Field Campus (www.sfsu.edu/~sierra/)
near Sierra Buttes where students integrate field studies of meadow hydrology and ecology with digital maps and datasets. Cooperative agencies where faculty and students pursue applied GIS research projects include California Academy of Sciences, San Francisco Estuary Institute, the San Francisco Zoo, and others.

Applied Geoscience research at SFSU is diverse, including a broad range of social, natural and physical sciences, as well as applications extending into the humanities and media studies. University faculty, staff and students are actively engaged in Geoscience research focused on ecological conservation modeling, spatial data model development for zoos and botanical gardens, environmental analysis, field-integrated geomorphic surface modeling, remote sensing models of fire-landslide linkages, geotectonic studies of historic and recent fault movement, micrometeorological landscape analysis, urban population modeling from satellite imagery, spatial analysis of health statistics, public participation GIS, urban planning applications, wetlands mapping, physical oceanography and decision support through Logic Scoring of Preferences.

These research programs are aided by expertise in specialized and advanced Geoscience methods, many of which are focused on integration of field data and advanced modeling. Particular expertise areas include spatially-enabled web service and application development, custom desktop application and tool development, spatial database design and modeling, cartographic design and map production, scientific visualization, LiDAR and terrain modeling, CAD integration, statistical integration with GIS, photogrammetry, object-oriented image analysis and GIS/field survey data integration.

For more information about the IGisc and SFSU’s Geoscience activities, please contact Jerry Davis, Director IGisc at jerry@sfsu.edu, 415/338-2983, or Barry Nickel, Associate Director, bnickel@sfsu.edu, 415/338-3566.

ABOUT THE AUTHOR
Brian B. Quinn, Ph.D. is the GIS Coordinator for City of Berkeley, where he has worked since 2002. He blogs on the use of Virtual World simulators for GIS and posts related videos on YouTube as Darb Dabney, moniker of his Second Life avatar, who first rezzed in October 2006. http://blog.simgis.com.
WINNER OF LAST ISSUE’S WHERE IN THE BAY AREA? CONTEST

How did you do on our last Where in the Bay Area? contest? Using his clever detective skills, Bill Clement, GISP, with the Central Contra Costa Sanitary District, recognized the last image as being an aerial view of Forever Fernwood Cemetery in Marin County. Congratulations Bill! He also praised our article in the last issue about Forever Fernwood, and how they are using high-resolution GPS equipment and a GIS system to manage their green burial cemetery. You can read the article and see all past issues on our website at www.BAAAMA.org/journal. We also encourage you to visit Forever Fernwood — it’s a beautiful open-space area, and a wonderful place for an afternoon stroll.

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UPCOMING BAAMA EVENTS

As you can see, we are already planning our 2009 educational sessions and networking events! If you have ideas for events, or would like to suggest a speaker or help plan a session, come to a board meeting or contact a board member!

Mark your calendars to save the dates! See www.BAAMA.org for up-to-date details.

NOVEMBER 19, 2008
GIS DAY
Location: UC Berkeley
(Mulford and Morgan Halls)
Located on campus near the West Circle, two blocks from Downtown Berkeley BART.

DECEMBER 11, 2008
BAAMA HOLIDAY PARTY
Location: Beckett's Irish Pub, Berkeley, CA
All BAAMA members and their guests are invited!
(Members get two free drink tickets.)

JANUARY 2008
EXACT DATE: TBD
BAAMA Board Meeting
Location: TBD
Members welcome! RSVP to Malcolm at MAAdkins@mbakercorp.com

JANUARY 21, 2008
EDUCATIONAL SESSION:
3D GEOSPATIAL TOOLS
Location: Metropolitan Transportation Commission Oakland, CA

MARCH 2008
EXACT DATE: TBD
BAAMA BOARD MEETING
Location: TBD
Members welcome! RSVP to Malcolm at MAAdkins@mbakercorp.com

MARCH 26, 2008
EDUCATIONAL SESSION:
FIELD/MOBILE MAPPING INCLUDING GPS
Location: Metropolitan Transportation Commission Oakland, CA

APRIL 6-9, 2009
CALGIS 2009
Sacramento, CA
Early-bird registration now open at www.calgis.org

MAY 2008
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BAAMA BOARD MEETING
Location: TBD
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MAY 28, 2008
EDUCATIONAL SESSION:
SERVER GIS
Location: Metropolitan Transportation Commission Oakland, CA

JULY 2008
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Members welcome! RSVP to MAAdkins@mbakercorp.com

JULY 23, 2008
EDUCATIONAL SESSION:
DISASTER PLANNING AND RESPONSE
Location: Metropolitan Transportation Commission Oakland, CA

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BAAMA BOARD MEETING
Location: TBD
Members welcome! RSVP to MAAdkins@mbakercorp.com

SEPTEMBER 24, 2008
EDUCATIONAL SESSION:
REAL ESTATE
Location: Metropolitan Transportation Commission Oakland, CA

A NOTE FROM THE EDITORS

KARIN TUXEN-BETTMAN  STELLA WOTHERSPOON

After four issues of the BAAMA Journal, we are very pleased with the progress the BAAMA Journal has made. We are happy to announce that we have now “greased the wheels” enough to hand over many of the Journal production tasks to interested volunteers. It is now easy for you to take ownership of an article — either to interview someone, write an article, or edit an article written by another author. Or, if you prefer, you can write one or more short features, like our fun Where in the Bay Area? piece.

We have had several consistent advertisers, including Autodesk, Ideate, HJW Geospatial, and MarinMap, and several others who have supports us in past issue including EarthData Fugro, GIS Academy, and Policy Innovation Works. We are very grateful for their support, which allows us to get each issue printed and distributed at our two annual events, CalGIS and GIS Day. If you would like to work with advertisers for our next issue — communicate with them about the process and collect their artwork, let us know!

Please contact us at Editor@BAAMA.org if you are interested in doing helping out for the next issue, due out at CalGIS in April.

Thank you, and enjoy the Journal!

Your mighty editors,
Karin & Stella
WHERE IN THE BAY AREA?

It’s amazing what you can see with today’s high-resolution aerial photography and satellite imagery. There are places in the Bay Area that most of us may never get to see… unless we see them from an eye in the sky! One example is the area pictured here. Can you guess what (and where) it is?

Aerial photography like this also allows us to see nearby urban, land, and water features, so we can take communities and the environment into account when we make decisions and plan for the future.

Identify this location and win a prize! Send your answers to Editor@BAAMA.org. One lucky winner will be randomly selected from all correct entries received by April 1st, 2009. The winner will be announced in the next issue, due out at CalGIS 2009.

BAAMA EXTENDS SPECIAL APPRECIATION TO ITS CORPORATE SPONSORS

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- County of Marin, Community Development Dept (www.co.marin.ca.us)
- County of Santa Clara, ISD (www.sccgov.org)
- County of Santa Clara, Planning Office (www.sccgov.org/portalsite/planning)
- East Bay Regional Park District (www.ebparks.org)
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- San Ramon Valley Fire Protection District (www.srvfpd.dst.ca.us)
- Santa Clara Valley Water District (www.valleywater.org)
- Stamen Design (stamen.com)
- Vallejo Sanitation & Flood Control
- ValueCAD (www.valuecad.com)
- WRA (www.wra-ca.com)