USDA Forest Service
Pacific Southwest Region (Region 5)
December 2011 California Wind Event

Facilitated Learning Analysis
January 2012

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Cover photo courtesy of Steve Burns, Lake Tahoe Basin Management Unit

I. Executive Summary

In late November and early December of 2011, the Pacific Southwest Region (Region 5, State of California) experienced a significant high wind event, which challenged National Forests that had ongoing prescribed fires. Following this event, Region 5 Fire and Aviation Management Staff initiated a Facilitated Learning Analysis (FLA) process to analyze individual actions and trends to define successes as related to prescribed fires and the wind event.

In order to get the most accurate information, the FLA Team interviewed the National Forests that were most affected through an open forum. Questions were developed by the team to gather the most constructive information for this analysis. Discussions were moderated by FLA team members. Additional calls to some National Forests, Geographic Area Coordination Centers (GACC's), Predictive Services and Regional Fuels Staff were made to clarify responses.

It was found that key elements of success were communications; a proactive approach from Regional and Forest leadership; validation of burn plan requirements; increased permanent staffing; and Agency Administrators and Line Officer support.

The interconnectivity of National Forests fire and fuels programs is to be recognized as playing a key role to the response to the wind event. If not for this singularity of purpose, the outcomes may have been different. This cohesive managerial approach, along with sufficient staffing levels and depth of experience, created a level of comfort for managers in meeting the requirements of the burn plans, patrols, initial attack, and resource mobilizations during this extreme weather event.

The FLA Team for this report are:

FLA Team Leader:
Pete Duncan-Deputy Forest Fire Chief-Plumas National Forest

Fuels/Prescribed Fire Subject Matter Specialist:
Sam Marouk-Deputy Chief, Operations Branch of Fire & Aviation California State Office, Bureau of Land Management

Writer/Editor:
Sue Zahn-Forest Vegetation Management Specialist, San Bernardino National Forest

II. Narrative

In early December 2011, the prediction for a significant wind event materialized across the Northern and Central Sierras challenging Forests which had active prescribed fires. This FLA will review the processes used which enabled positive outcomes from actions undertaken throughout the event.

During the month of November, there had been normal to slightly below normal seasonal precipitation throughout the Sierra Nevada's. At the end of this month, continued off shore winds caused vegetation to dry to critical moisture levels (Figure 1) for this time of year.

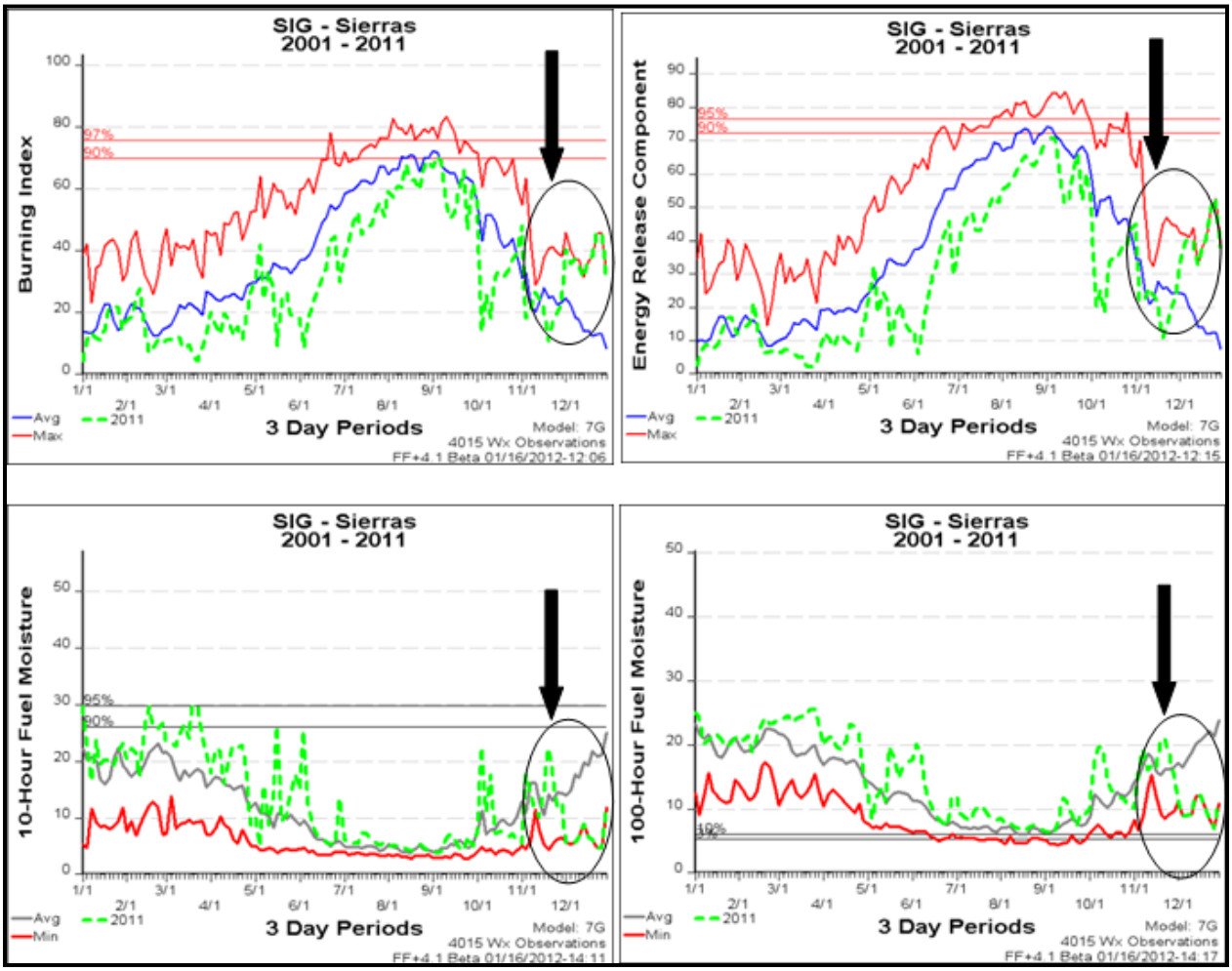


Figure 1-Graphs indicating rapid rise of Burning Index and Energy Release Component indices and drop of fuel moistures-Between November 29th and December 5th, 2011.

Forests within the Sierra Nevada's had active prescribed fire projects during the month of November. The forests selected for this analysis had over 8500 acres of active prescribed fire at the time of the wind event. The selected forests were the Eldorado, Mendocino, Plumas, Sequoia, Shasta Trinity, Stanislaus and Lake Tahoe Basin Management unit.
On Monday November 28th, during the Region 5 Fire Board of Directors (BOD) weekly conference call, Predictive Services Meteorologist, John Snook stated;

"The biggest news, from a fire weather stand point this week; will be a moderate to strong north to northeast, then east Foehn wind event from Wednesday afternoon into Friday morning. Beyond that it appears that the main access of high pressure aloft will remain near the west coast well into the first half of December, so, look for below average rain fall to continue across most if not all north ops"

Because fuel moistures and relative humidity were still above critical levels, no warnings were issued until November 29th when Predictive Services issued the first of several high risk alerts for elevated fire danger due to high winds.

"This was building up to be the most significant wind events in many years. Wind prone areas could see up to 90 mile per hour wind speeds" *Basil Newmerzhycky, Predictive Services Meteorologist*

On November 30th, 2011 a wind event warning was issued by the National Weather Service and e-mailed by California Emergency Management Agency (Cal-EMA) to the Federal, State and Local fire cooperators, which included the Region 5 Director of Forest Service Fire and Aviation. This warning was for "*Prolonged Period of Strong Northeast and Offshore Winds and Low Relative Humidity"*, throughout California. This information was disseminated to the GACC's, Forest Supervisors, Forest Fire Staffs and District Rangers.

During the daily California Air Resources Board smoke coordination conference call, meteorologists shared forecast specifics with prescribed burners across the state, reinforcing the warnings of a wind event.

Learning of these predicted winds, Forest and District Fire and Fuels managers initiated appropriate actions, which included the reviewing of burn plans, checking on status of previously burned units, and making an assessment of available resources. Based on their projected needs, forests increased staffing levels for patrol of burn units and prepared for additional responses.

Issued 0800 pst Wednesday November 30th, 2011
For use November 30:
-This product will be issued only non-holiday weekdays until fire season 2012-

****Prolonged period of strong northeast/offshore winds and low RH****

The combination of deepening low pressure over Nevada in a strong high across Oregon will produce a very strong North to North East wind event across the entire region over the next few days. Strongest winds will be tonight into Friday with gusts over 60 mph across the Sierra as well as the East Bay Hills. These prolonged winds will keep humidity low, both day and night. Fuel remains moist from recent rains, but significant drying over the next several days, with lingering north to east winds into the weekend.

-Basil Newmerzhycky, Predictive Services Meteorologist

By December 1st, some Forests were experiencing wind gusts in excess of 60 miles per hour. These winds caused previously inactive burn units to become active, requiring an elevated commitment of resources. This increase in fire activity and resource commitment was being seen throughout the Region. Ground resources kept Fuels and Fire Managers appraised of burn unit status and additional needs. For some Forests, this required personnel to return from or cancel scheduled leave and at times work extended hours in temperatures well below freezing.

On the Lake Tahoe Basin Management Unit (LTBMU), firefighters were faced with continually freezing hose lays and nozzles. Concurrently, some Forests experienced an increased response to wildland fires within Forest's Direct Protection Areas (DPA's) which presented staffing and logistical challenges. On the Eldorado National Forest, Fire Managers made the decision to treat new and existing fires as a complex. Doing so allowed for the efficient management of resources. Parts of the Stanislaus National Forest were experiencing wide spread power outages which complicated the logistical support of off-Forest resources, who had responded to help with staffing issues.

As the wind event developed, continual two-way communication occurred between ground resources and Forest Management as well as Forest Management and GACC managers. This proved to be invaluable in allowing for an efficient and coordinated response throughout the Region. One example of a strong communication chain was provided by the Sequoia National Forest (SQF). Updates on burn unit status started with the Burn Bosses then elevated to the District Fire Management Officer (DFMO) then to the District Ranger. Updates were also elevated by DFMO to Forest Fire Management Officer (FFMO) and eventually to the Forest Supervisor and GACC. The DFMO and FFMO also kept in contact with the dispatch center regarding resources commitments, status, and needs for off forest assignments.

Throughout the wind event, Forests reported taking various steps to develop strategies and tactics to manage staffing and response levels. Although Forests initially reported they "were just doing what we do" in respect to managing the situation, the FLA found the strategies and tactics were developed based on existing operating plans.

In general, the strategies followed were;

- Maintain control of existing Rx fires.
- Maintain IA capability.
- Maintain communications with GACC's on incident status and resource needs/availability.

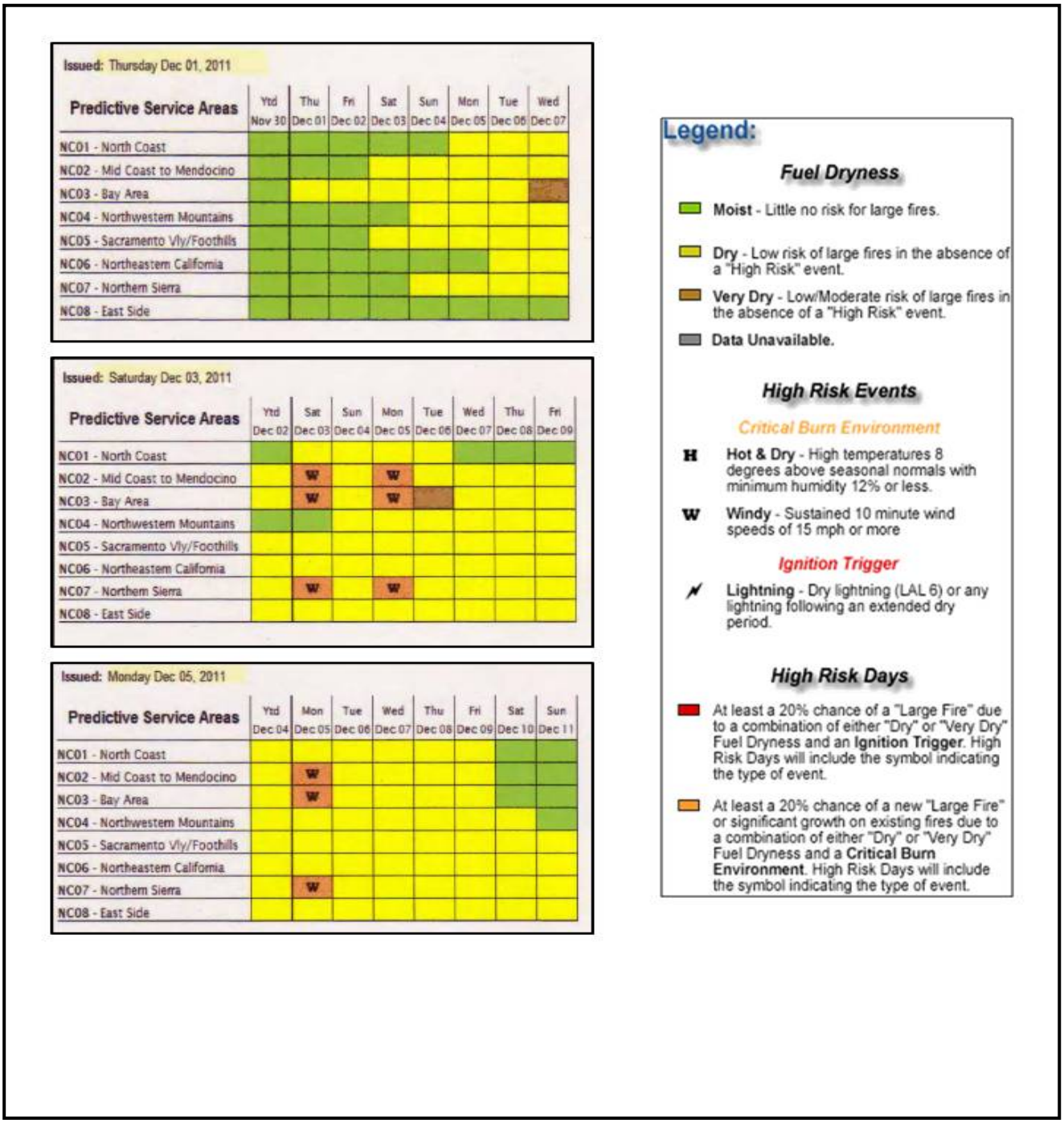
As the forecasted winds arrived, Forests implemented planned responses which included some or all of the following tactics:

- Units reviewed and followed contingency and patrol requirements of burn plans.
- Patrol frequency of burn units was increased.

- Staffing patterns were adjusted to meet forest needs.
- Incident management organizations were deployed to most efficiently manage conditions.
- Cooperator agreements were utilized to augment existing resources.

By December 7th, the wind event had abated. No Forest Service prescribed fire escapes were reported and wildland fires within these forest's DPA's were controlled.

Figure 2-7-Day Significant Fire Potential



III. Elements of Success Recognized by FLA Participants

Based on responses to questions posed to the Forests by the FLA team, the Forests felt the following points contributed to their success

- Communications - there was a constant flow of timely information between the Region, Forests, Line Officers, and ground resources.
- Regional Fire and Fuels leadership took a proactive approach in providing leadership and support to the forests.
- Forests reviewed and validated patrol/contingency requirements of burn plans and at times increasing the frequency of required patrols.
- Forests took a hands-on approach to recognizing changing conditions and reacting according to established management plans.
- An adequate workforce was available due to increased permanent staffing. This was key to the success of forests abilities to manage prescribed fires and respond to emerging incidents.
- Agency Administrators and Line Officers were engaged in the support of staffing, program oversight, and administrative needs.
- Pre-existing agreements and positive relationships with cooperators allowed for a cohesive unified response to incidents.

> *"…we reviewed burn plans, prescriptions and mop up standards… had direct contact with each of the units on a frequent basis. In depth discussions were had on what the mop up standards meant to the field vs. line, etc. and possible impacts if not followed to the "t".*
>
> *-Paige Boyer, Deputy Forest Fire Chief-Shasta-Trinity NF*

> *"It is the constant vigilance that the region has been doing in regards to being prepared…. We have been conditioned to have resources up and ready to help other forests….in the old days it wasn't all that coordinated. [This vigilance] makes things easier and along with the increased staffing of the 26/0's, to have that backbone ready to deliver"*
>
> *-Brent Skaggs, Forest Fire Chief, Sequoia N.F.*

IV. Key to Success from the FLA team's perspective

In reviewing the actions taken by Forests during the wind event the FLA team found Forests were able to size up the situation, appropriately staff burn units, provide for Forest contingency while making resources available for mobilization.

As defined by the Interagency Prescribed Fire Planning and Implementation Guide, contingency plans consider "possible but unlikely events and the actions needed to mitigate those events."

Forests used the words "pre-occupation with failure" and "relentless oversight" when discussing the actions which lead them to a successful outcome. Sound contingency planning played a key role on all the Forests.

The following key successes were identified by the FLA team:

Communications

- Predicted Services played a key role, early warning system and notification.
- Dissemination of pertinent information integral to preparedness for the pending event.
- A continued flow of information between Region, Forests, and field resources allowed for appropriate staffing and response levels.

Managerial Approach

- Forests followed current FS policy as it relates to prescribed fire.
- Burn plans addressed patrol and contingency needs.
- Forests followed patrol and contingency requirements of burn plans.
- Tracking of burn projects allowed Forests to determine unit status and staffing requirements in order to respond appropriately.

Workforce Availability

- Addition of permanent positions allowed for appropriate staffing levels.
- Restoration of use or lose annual leave was considered and/or approved.
- New IA activities did not detract from patrolling of burn units.
- Applicable policy and guides were followed.

V. Attachments

a. FLA Team Questions to the Forests

FLA Questions

Wind event timeframe November 30th to December 6th 2011

When and how did you receive notification of the predicted wind event?

What steps did your unit take to get ahead of the wind event to prevent problems?

How did you organize available resources to assure success with patrol, IA availability, and potential off forest assignments?

Did scheduled holiday leave affect the availability of resources?

How did you track status of Rx fire units? (Patrol, out etc)

How did communications work for your unit? Such as information sharing with GACC, Region, Forests Districts, and staff areas?

Is there a resistance to communicate up or down the chain of command when there may be problems? (Field to Forest, Forest to GACC, etc.) if yes, why?

Is there support from Line Officers/Agency Administrators/key leadership for the unit's Rx fire program? What does that support look like? Is the support there when problems arise?

How did Rx fire activities on adjacent private property affect your decision making process and resource availability?

Recommendations from Forests

- What worked?
- What would you do different?
- Any suggestions for Regional and GACC levels?

What is the one lesson learned would you want others to get out of this event?

b. Cal-EMA Weather Warning (e-mail)

TO: **REGIONAL FIRE AND RESCUE MUTUAL AID COORDINATORS**

Daryl Osby	**Region I Coordinator**
Sheldon Gilbert	**Region II Coordinator**
Doug Wenham	**Region III Coordinator**
Mark D'Ambrogi	**Region IV Coordinator**
Keith Larkin	**Region V Coordinator**
Dale Hutchinson	**Region VI Coordinator**
Ken Pimlott	**CAL FIRE**

FROM **Kim Zagaris**
State Fire and Rescue Chief

DATE: **November 30, 2011**

SUBJECT: **California Fire Weather Wednesday - Friday**

NOTE: *******INFORMATIONAL*******

PLEASE DELIVER TO REGIONAL FIRE AND RESCUE COORDINATOR

Please forward and distribute to the CAL EMA (OES) Fire and Rescue Regional Coordinator and CAL EMA (OES) Fire and Rescue Operational Area Coordinators within your region.

Please insure that the CAL EMA (OES) Fire and Rescue Operational Area Coordinators forward and distribute to local Fire Agencies within their Operational Areas.

<<<<<<<<<<<<<<<<<<<<<<<**MESSAGE**>>>>>>>>>>>>>>>>>>>>>>>

Weather Report -Northern Region

***** Prolonged Period of Strong Northeast and Offshore Winds and Low Relative Humidity *****

The combination of deepening low pressure over Nevada and a strong high across the Oregon will produce a very strong North to Northeast wind event across the entire region over the next few days. Strongest winds will be tonight into Friday with gusts over 60 mph across the Sierra as well as the East Bay Hills. These prolonged winds will keep humidity low, both day and night. Fuels remain moist from recent rains, but significant drying is expected over the next several days, with lingering north to east winds into the weekend.

Weather Report - Southern Region

*****Very strong offshore wind event tonight through Friday morning*****

A trough dropping into Nevada from the Pacific Northwest will bring much cooler temperatures and a little increase in humidity to most of the region today. However, temperatures will still be around 5 degrees above normal for this time of year. There will be westerly winds of 20 to 30 mph with gusts to 50 mph over the mountains and deserts of Southern California this afternoon. A couple of areas of low pressure will form along the Colorado River bringing well below normal temperatures to the region Thursday through early next week. Strong north to east winds of 25 to 50 mph with gusts to 80 mph will occur over the mountains and below the canyons and passes of Southern California tonight

through early Friday afternoon. These winds will decrease a little to 20 to 30 mph with gusts to 50 mph mid Friday afternoon through early next week. Wind prone areas of Central California will receive north to east winds of 20 to 40 mph with gusts to 60 mph this afternoon through Friday morning and then they will decrease to 15 to 25 mph with gusts to 40 mph Friday afternoon through early next week. Scattered showers will occur over the mountains and deserts of Southern California east of the Cajon Pass from time to time Thursday through early next week. The snow level will be around 4,000 feet.

c. Glossary

Burning Index (BI): Reflects the changes in fine fuel moisture content and wind speed and is highly variable day-to-day. The BI is more appropriate for short-term fire danger and can be loosely associated with flame length by dividing the BI by 10. The BI is readily affected by wind speed and fine fuel moisture.

Energy Release Component (ERC): Serves as a good characterization of local seasonal fire danger trends resulting from the area's fuel moisture conditions. The ERC is a relative index and should be compared to historic trends and thresholds on the corresponding area's pocket card. The ERC relies heavily on large and live fuels, has low variability, and is not affected by wind speed.

The Team appreciated the opportunity to take this positive approach toward this large scale success and would like to thank:

Fire Management Staff on the Eldorado, Mendocino, Plumas, Sequoia, Shasta-Trinity, Stanislaus National Forests, and Lake Tahoe Basin Management Unit.

Predictive Services at Northern California Geographic Center, Northern California Geographic Center, and the Southern California Geographic Center.