

Attachment J- 2014 IPAWS Adoption Study Summary

**The Integrated Public Alert and Warning System:
Current Practices and Perceptions of California Jurisdictions**

Prepared for
The California Governor's Office of Emergency Services

By
Oak Ridge Associated Universities
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Executive Summary

During an emergency, public safety officials need to provide the public with lifesaving information quickly. The Integrated Public Alert and Warning System (IPAWS) is a modernization and integration of the nation's alert and warning infrastructure. Federal, state, territorial, tribal, and local alerting authorities can use IPAWS and integrate local systems that use Common Alerting Protocol standards with the IPAWS infrastructure.

However, the Federal Emergency Management Agency (FEMA) has faced coordination issues and technical challenges with IPAWS during the development and implementation phases. Counties and cities all over the United States have been hesitant to sign up or use the system (Government Accountability Office, [GAO], 2009). Currently approximately one half of California's cities or counties are an IPAWS Public Alerting Authority.

A survey was conducted to gather information regarding the knowledge, attitudes, and practices of California public safety officials with respect to IPAWS and the use of Wireless Emergency Alerts (WEAs). Potential survey participants were drawn from a list of 58 public safety officials provided by the California Governor's Office of Emergency Services (Cal OES), and 40 of these individuals completed the survey.

Approximately half of survey participants were in jurisdictions that are not IPAWS alerting authorities, and the results suggest that these jurisdictions are interested in and open to becoming alerting authorities. The most frequently requested form of assistance for becoming an alerting authority was general training on the system. Additional funding and staff were also frequently requested forms of assistance.

For those jurisdictions that are authorized alerting authorities, the results show that a large majority of jurisdictions have chosen not to issue WEA alerts, and that jurisdictions appear to be expending minimal effort to fully implement the IPAWS system in terms of testing, coordinating with other jurisdictions, or educating the public about the system.

Two perceived challenges with WEAs appear to account for these patterns. First and foremost is a lack of precision in the geographical targeting area of the alerts (currently WEAs must be sent to an entire county). The second prominent complaint concerned WEA message content and length. Participants judged that the number of characters (90) allowed for WEA messages is too few. While not as prominent, improvements to the content of WEA messages were also frequently suggested. These improvements included adding languages, adding voice capability, and ensuring that messages are more easily understandable by members of the general public.

Recommendations to help increase the use and effectiveness of IPAWS and WEAs are:

- Examine solutions regarding the limited message length and imprecise targeting of messages;
- Convene a meeting of current alerting authorities to further explore their challenges and coordination issues regarding IPAWS and WEAs;
- Provide training to current AAs on WEA testing procedures;
- Conduct a state-wide public education campaign on WEAs (most counties have not conducted campaigns, and may not have the funding available to do so);
- Promote current training resources to non-alerting authorities to encourage participation in the IPAWS; also consider conducting webinars and face-to-face training.

Background

During an emergency, alert and warning officials need to provide the public with lifesaving information quickly. The Integrated Public Alert and Warning System (IPAWS) is a modernization and integration of the nation's alert and warning infrastructure. Federal, state, territorial, tribal, and local alerting authorities can use IPAWS and integrate local systems that use Common Alerting Protocol standards with the IPAWS infrastructure.

IPAWS provides public safety officials with an effective way to alert and warn the public about serious emergencies. It uses the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), the National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other public alerting systems from a single interface.

The Federal Emergency Management Agency (FEMA) has faced coordination issues and technical challenges with IPAWS during the development and implementation phases. Counties and cities all over the United State have been hesitant to sign up or use the system (Government Accountability Office, [GAO], 2009). Currently, approximately one half of California's cities or counties are an IPAWS Public Alerting Authority.

A survey of public safety officials was conducted to gather information on current knowledge, attitudes, and practices related to systems and tools used to alert the public during an emergency. Specifically, participants from jurisdictions that are IPAWS alerting authorities were asked questions concerning:

- Systems/tools used to alert the public current practices of the WEA and the IPAWS
- Frequency of issuing alerts
- WEA implementation practices
- Perceptions of WEA strengths and weaknesses and suggestions for improving the IPAWS system

Individuals from counties that are currently not IPAWS alerting authorities were asked questions concerning:

- Plans for becoming an IPAWS alerting authority
- Assistance needed to help jurisdictions to complete the process of becoming an IPAWS alerting authority
- Factors that would increase the likelihood of becoming an IPAWS alerting authority

The survey results were intended to assist The California Governor's Office of Emergency Services (Cal OES) to (1) identify potential improvements in the WEA system, (2) develop training for public safety officials regarding IPAWS/WEA, and (3) provide assistance to help jurisdictions complete the process for becoming IPAWS alerting authorities.

Oak Ridge Associated Universities (ORAU) provided support to the Cal OES for this data collection effort

involving public safety officials from 58 counties in California using a Web-based survey. ORAU developed the survey in consultation with Cal OES, programmed the survey, and collected the survey results using the NOVI Systems online survey software.

Methods

Participants

Participants were public safety officials throughout the 58 counties of California.

Data Collection

Participant Recruitment

Potential survey participants were drawn from a list of public safety officials provided by Cal OES. An e-mail invitation to complete the survey was sent to 58 public safety officials on July 11, 2014. An e-mail reminder to complete the survey was sent by ORAU to these individuals on July 18, 2014. On July 22 and July 24, 2014, an ORAU staff member called public safety officials who did not complete the survey to ask that someone in their office complete the survey. The survey was closed on August 1, 2014. All survey participants were volunteers, and no funds or incentives were paid to participants.

Data Collection Procedure

ORAU utilized the in-house NOVI electronic survey tool to collect data from participants, who were able to participate in the survey by clicking on the Web link provided to them. Survey questions concerned current perceptions and practices of emergency alert systems among IPAWS AAs and non-IPAWS alerting authorities (see Appendix A). Based on pilot testing with ORAU staff, the survey was anticipated to take about 10 minutes to complete. The survey was conducted in English. Individuals not responsible for issuing county-wide emergency alerts were screened from participation.

Data Analysis

Closed-ended responses were analyzed using frequency distributions and the calculation of proportions across responses. Not all participants answered every survey question, and proportions were calculated based on the number of participants responding to each question. The unit of analysis for these calculations was the participant.

Participant open-ended responses were also analyzed. For some survey questions, mutually exclusive and exhaustive categories were developed to summarize the content of these comments. The categories were developed by two analysts through repeated examination and regrouping of similar participant comments. The unit of analysis in these cases was a distinct open-ended comment. Replies that did not supply substantive answers (e.g., “Not able to answer”) were excluded from these analyses.

In some cases, the number of open-ended replies was relatively small such that the grouping of replies to develop one or more larger categories was not appropriate. In general, comments that could not be usefully grouped with at least one other comment were not further analyzed in this report. (All open-ended replies are included in Appendix B.)

Finally, open-ended comments were examined across survey questions to identify cross-cutting themes. Comments that reflect such themes were reported in the analysis of individual questions, even if there was only one such reply for that question.

Results

Participants

A total of 43 individuals began the survey, but not all of these individuals were included as participants. First, individuals in organizations that were not responsible for issuing county-wide emergency alerts were excluded from the survey, and one individual was excluded for this reason. In addition, one individual began but did not complete the survey. Finally, although two individuals from San Mateo County participated in the survey, only the responses of the individual that completed the entire survey were included in the analysis. Therefore, the analysis below is based on responses from 40 participants. Participants were asked to provide their job titles and these varied substantially. (See Appendix C for a complete list of job titles.) The most frequently reported titles were County Emergency Manager / County Emergency Services Manager (n = 7), and Emergency Services Manager / Emergency Manager (n = 5).

Participants were asked if their jurisdiction had completed the necessary steps to become an approved IPAWS alerting authority. Those who answered “yes” will be referred to as Alerting Authorities (AAs) and those who answered “no” will be referred to as non-IPAWS alerting authorities. Nineteen AAs and 21 non-IPAWS alerting authorities participated in the survey. The counties represented by each of these groups are shown below and in Figure 1.

<u>Counties of AAs</u>	<u>Counties of Non-IPAWS alerting authorities</u>
Butte	Alameda
Contra Costa	Amador
Madera	Colusa
Merced	El Dorado
Monterey	Humboldt
Riverside	Imperial
Sacramento	Kern
San Bernardino	Kings
San Diego	Lake
San Francisco	Los Angeles
San Joaquin	Marin
San Luis	Mariposa
San Mateo	Mendocino
Shasta	Mono
Stanislaus	Nevada
Tulare	Santa Clara
Tuolumne	Santa Cruz
Ventura	Sierra
Yolo	Solano
	Sonoma
	Sutter

IPAWS Alerting Authorities

This section reports results for participants from jurisdictions that are IPAWS AAs.

Emergency Alerting Practices

In this section of the survey, participants were asked questions concerning:

- Non-WEA alerting systems and tools
- Frequency of issuing alerts
- Frequency of issuing alerts using WEA

AAs were first asked about systems or tools other than WEAs that their jurisdiction currently uses to alert the public. As seen in Table 1, large majority of AAs reported that they use the Emergency Alert System (EAS), traditional news media outlets, social media, and reverse 911 systems.

Table 1. Non-WEA alerting systems / tools (n = 19)*

Systems/Tools	Frequency	%
Emergency Alert System	18	94.7%
Social Media (Twitter/Facebook)	17	89.5%
Traditional news media outlets (e.g., TV, radio)	16	82.4%
Reverse 911 Service	15	78.9%
E-mail	13	68.4%
SMS (mobile)	10	52.6%
Changeable message signs	10	52.6%
Sirens	8	42.1%
National Warning System (NAWAS)	7	36.8%
Nixle.com	6	31.6%
Emergency Digital Information Service (EDIS)	3	15.8%
Other	2	10.5%

*Participants could choose more than one answer, so percentages sum to greater than 100%.

Participants were next asked how many times in the past 2 years their jurisdiction had issued an emergency alert and how many times their jurisdiction had issued an emergency alert using WEA (see Table 2 and Figure 2).

- About one half of jurisdictions had issued an emergency alert 3 times or fewer, while about one half had issued these alerts 4 or more times.
- Almost one third of jurisdictions had issued emergency alerts more than 6 times.
- Almost three quarters of the jurisdictions had not issued any WEA alerts in the past 2 years.

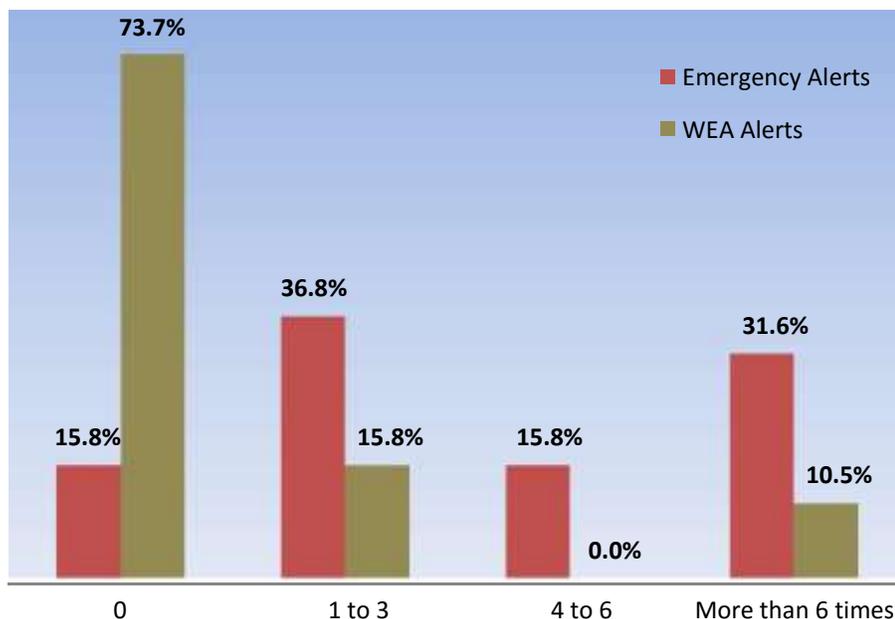
The counties where WEA alerts were issued were:

- Contra Costa
- Madera
- Sacramento
- San Luis
- San Mateo

Table 2. Number of times the organizations has issued an emergency alert and WEA alerts (n = 19)

Number of Alerts	Emergency Alerts	WEA Alerts
0	3	14
1 to 3	7	3
4 to 6	3	0
More than 6 times	6	2

Figure 2. Number of times jurisdictions have issued an emergency alert and an alert using WEA in the past 2 years (n = 19)



The rank order correlation between the number of emergency alerts issued and the number of alerts issued using WEA was 0.58, indicating a relatively strong association between the two alerting practices. This suggests that jurisdictions tend to issue WEA alerts and alerts in general with roughly similar frequency.

As noted previously, about three quarters of jurisdictions had not issued any WEA alerts in the past 2 years, and these participants were asked to describe their reasons for not yet using the WEA system (see Table 3).

Table 3. Reasons for not yet using the WEA system (n = 14)*

Reasons for not yet using the WEA system	Frequency	%
Other	12	85.7%
Lack of funding	2	14.3%
Population density does not warrant the use of WEA.	2	14.3%
Cell phone coverage is not adequate.	2	14.3%

*Participants could choose more than one answer, so percentages sum to greater than 100%.

Most participants chose the “Other” response option to describe their reasons for not issuing a WEA. Several of these jurisdictions (n = 3) had not had an occasion to issue any emergency alerts since becoming AAs, and so they did not have a need for WEA alerts.

However, the most common reason given for not issuing WEA alerts referred to the size of the WEA target area (n = 7; 54%). Several participants stated that the target area (an entire county) is too large to be useful.

“WEA alerts will notify everyone in the County. During the past two years, there hasn’t been an emergency necessitating the notification of everyone in the County. Other methods were sufficient.”

“Inability to geographically target at less than County-wide level.”

Other participants suggested a similar problem in noting that no incidents large enough for the use of a WEA had occurred in their jurisdictions.

“Can only launch to the entire County. Most messages are for smaller groups.”

“Not needed for small incidents.”

WEA Implementation Practices

In this section of the survey, participants were asked how their jurisdictions have been implementing the WEA system. Specifically, participants were asked questions regarding the following:

- Staff training
- System testing
- Coordination with other jurisdictions
- Public education campaigns

With regard to staff training, the number of trained staff members ranged from 1 to 20. A large majority of jurisdictions (82.4%) reported having at least one staff person trained to issue a WEA, and more than one half of jurisdictions (58.8%) reported having 3 or more trained staff members.

Figure 4. Number of staff persons trained to issue WEA alerts (n = 17)

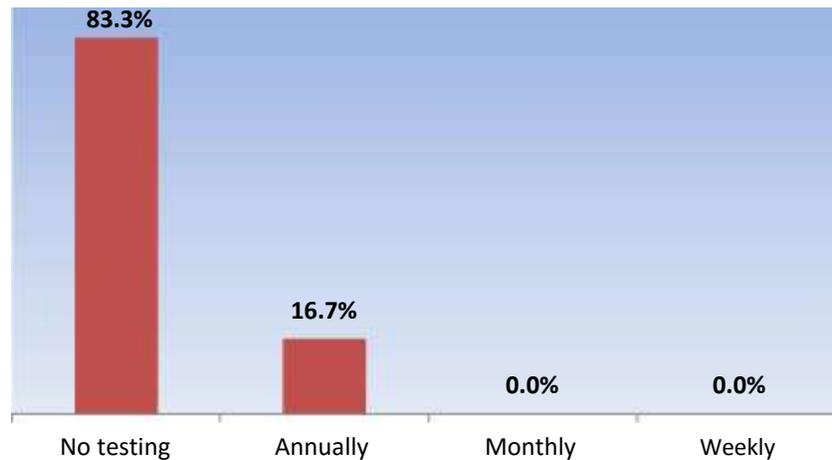


AAs were then asked how often they tested their WEA system. There were 12 participants who indicated that they have not regularly tested their system, and three participants also indicated not testing their system in

“Other” responses:

- “There is no provision for testing the WEA system”*
- “Still in process of configuring/training”*
- “Dispatch center does not have this system”*

Thus more than 80% (n = 12 + 3 = 15) of jurisdictions reported not regularly tested their WEA system. One sixth (n = 3) of participants reported testing their system on an annual basis, and no jurisdictions tested their systems more frequently than annually (see Figure 5).

Figure 5. Frequency of WEA system testing (n = 18)

AAs were then asked about the challenges and concerns regarding the regular testing of their WEA system (see Table 5). The most common challenge reported by AAs was not yet having finalized their procedures for testing WEA.

Table 5. Challenges and concerns regarding regular testing of their WEA system (n = 18)*

Challenges and concerns regarding regular testing of their WEA system	Frequency	%
We have not yet finalized our procedures for WEA testing	9	50.0%
We have not integrated WEA testing into our testing rotation	6	33.3%
We are concerned about false alerts	6	33.3%
We are concerned about bleed over into another county	4	22.2%
Other	5	27.8%

*Participants could choose more than one answer, so percentages sum to greater than 100%.

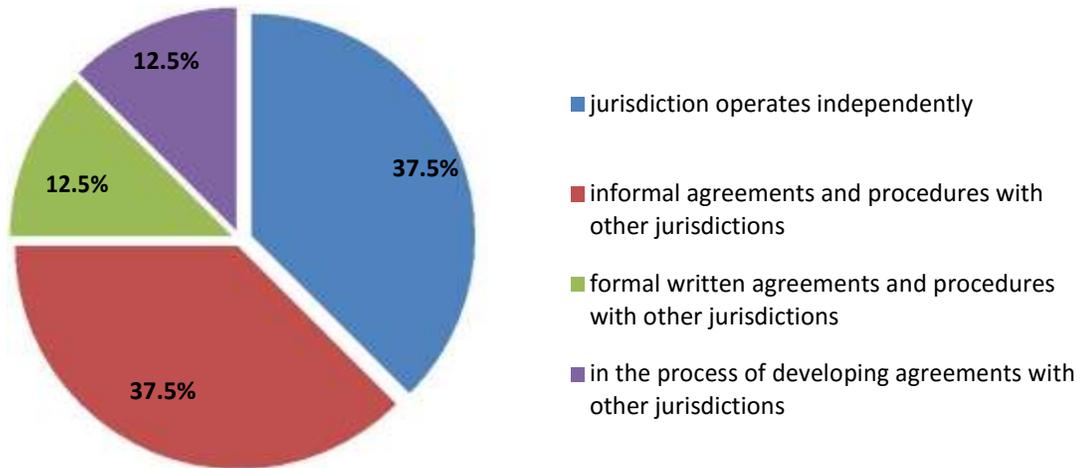
In 4 open-ended replies (i.e., “Other” responses), participants indicated that they did not know that the WEA system could be tested (n = 2), and they also reported concerns about possible negative effects of testing on communities (n = 2; see Table 6). Note that these latter comments are similar to closed-ended replies chosen by 10 participants (“We are concerned about false alerts.”; “We are concerned about bleed over into another county.”). Taken together, closed- and open-ended replies concerning potential negative effects of testing on communities (n = 2 + 10 = 12) accounted for more than one third (35.3%) of all responses (n = 30 + 4 = 34).

Table 6. Challenges with WEA testing in open-ended replies

Theme	Comment(s)
Not aware that testing is possible	<p><i>“There is no provision for testing the WEA system.”</i></p> <p><i>“We understood that there is currently no test code available.”</i></p>
Concerned about effect on community	<p><i>“Actual testing may cause concern and misunderstanding in the community.”</i></p> <p><i>“Testing live alert system is too intrusive.”</i></p>

AAs also described how their jurisdictions work with the other jurisdictions to coordinate the use of the WEA. Most AAs either operate independently and do their own alerting, or they have informal agreements and procedures with other jurisdictions regarding the use of WEA (see Figure 6).

Figure 6. Alerting authority means of coordination with other jurisdictions (n = 16)



Finally, with respect to public education campaigns, 7 (41.2%) jurisdictions had conducted public education campaigns about WEA while 10 jurisdictions (58.8%) had not conducted public education campaigns.

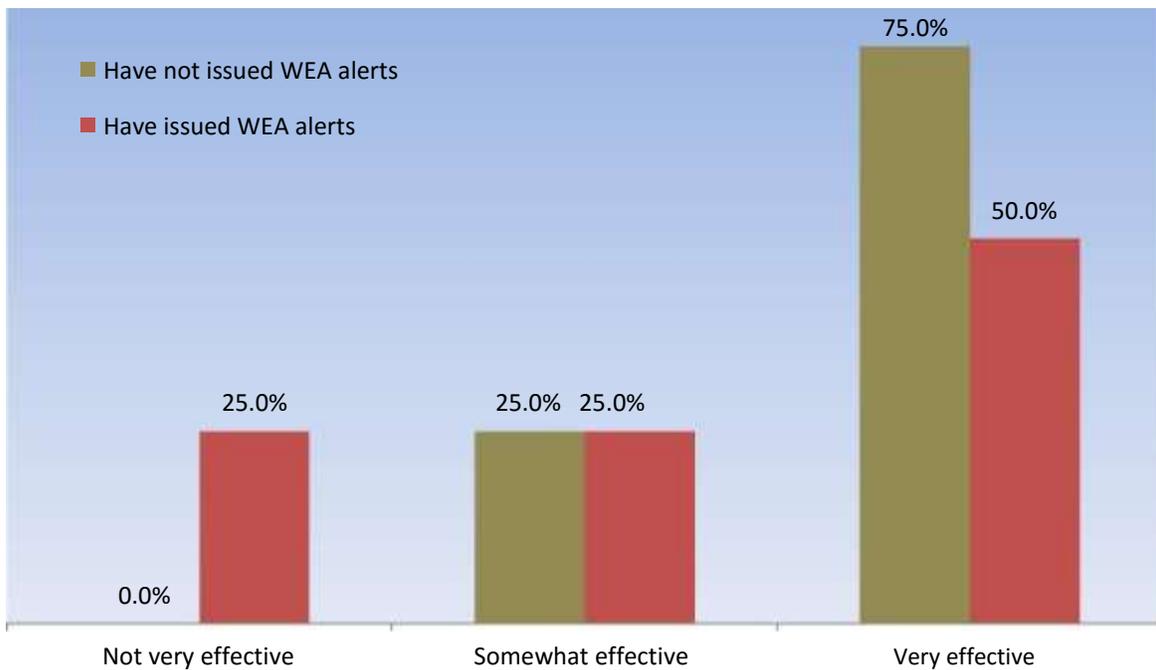
Assessment of WEA

In this section of the survey, participants were asked to assess the effectiveness of WEA alerts and to describe challenges experienced with the system.

First, participants were asked how effective alerts using WEA have been for reaching the public within their county. As reported in Table 2 previously, most jurisdictions had not yet used WEA, and 10 of these 14 participants indicated this in response to this question.

However, 4 participants from these jurisdictions did offer an assessment of WEA effectiveness. These are reported in Figure 7, along with responses from jurisdictions that have issued WEA alerts (n = 4). WEA alerts were rated as “very effective” by one half of jurisdictions that have issued WEA alerts.

Figure 7. Perceptions of WEA effectiveness for jurisdictions having issued WEA alerts (n= 4) and those that have not issued WEA alerts (n=4)



AAs also described the challenges they had encountered with the use of WEA (see Table 7). More than two thirds of participants indicated that “targeting WEA messages to areas smaller than the county level” was a challenge, and almost one half reported that “text length limitations of WEA” presented a challenge. In open-ended replies, one participant reported a challenge with poor message construction. (For a complete list of comments see Appendix B, Question 1.16.)

Table 7. Challenges with the use of WEA (n = 16)*

Challenges with the use of WEA	Frequency	%
Targeting WEA messages to areas smaller than the county level	11	68.8%
Text length limitations of WEA	7	43.8%
Other	5	31.3%
WEA messages do not reach all citizens	2	12.5%

*Participants could choose more than one answer, so percentages sum to greater than 100%.

Improving the WEA System

In this section of the survey, public safety officials were asked to suggest ways to improve the WEA system. Specifically, participants were asked to provide recommendations with respect to:

- making WEA easier to use
- making WEA more effective for alerting the public
- general improvements to the WEA system

AAs first provided suggestions for making WEA easier to use in their jurisdictions. (For a complete list of comments see Appendix B, Question 1.18.) Suggestions covered a variety of topics that included providing more precise geographical targeting, additional or revised WEA training and education, message length, and better mapping capabilities (see Table 8).

Table 8. Suggestions for making WEA easier to use

Theme	Comment(s)
More precise geographical targeting	<i>"Targeting WEA messages to areas smaller than the county level ."</i> (refers to participant's response to a previous question)
	<i>"WEA needs to be improved so that the alerting authority can precisely target areas to alert. Currently, the County's geographical borders are the lowest derivative that a WEA alert can be sent to."</i>
Better mapping	<i>"Better mapping tools."</i>
Additional or revised training and education	<i>"Create a cheat sheet (1 page) for launch specifics so that we don't have to refer back to the course."</i>
	<i>"I am not sure. I really don't understand the technology behind the system to answer that. But then again maybe that is my answer!"</i>

We will never be rid of the

“CMAS and CMAM nomenclature now. — very confusing.”

Message length

“Increase character count.”

AAs also provided recommendations for how the WEA can be made more effective for alerting the public. (For a complete list of comments see Appendix B, Question 1.19.) The most common suggestion was to improve the geographic targeting capabilities (n = 5). Other participants suggested improvements to the message content or length and public education campaigns (see Table 9).

Table 9. Suggestions for increasing WEA effectiveness

Theme	Comment(s)
Message content/length	<p><i>“There are real restrictions on the message content that really limits emergency management from providing real credible information on the problem and what protective actions need to be taken.”</i></p> <p><i>“Increase text length.”</i></p> <p><i>“Increase character count.”</i></p>
Public education	<p><i>“Public information campaigns on WEA and what it is about.”</i></p> <p><i>“Statewide education campaign.”</i></p>

AAs also provided a variety of other suggestions improving the WEA system (for a complete list of comments see Appendix B, Question 1.20). Suggestions included better coordination or communication among authorities with responsibility for emergency alerts, more precise geographical targeting, better mapping capabilities, and improvements to message content/length.

Table 10. Suggestions for improving the WEA system

Theme	Comment(s)
Coordination/communication among authorities	<p><i>“More feedback for the Alerting Authority-side confidence models.”</i></p> <p><i>“Require NWS to coordinate messaging with affected op areas.”</i></p> <p><i>“Provide heads up to public safety before WEA activated. and/or provide public safety a standard website for more information regarding a recent alert.”</i></p>
Message content/length	<p><i>“Add other languages.”</i></p> <p><i>“Increase number of available characters from 90.”</i></p>
More precise geographical targeting	<p><i>“Become more user friendly and the ability to target a specific area rather than the entire county. Sacramento County like other CA counties is a fairly large geographic area.”</i></p>

“Provide a report/data on true area notified. Map of activated cell towers and an estimate of their range.”

Better mapping

“Provide a REST mapping service that indicates the area notified.”

Finally, the survey also sought public safety officials’ suggestions for improving the process for becoming an IPAWS alerting authority. (For a complete list of comments see Appendix B, Question 1.17.) One half of the AAs reported that the process for becoming an IPAWS alerting authority was a simple process and did not need improvement. However, other AAs suggested changes to WEA message content/length, improved training, and improved coordination among jurisdictions.

Table 11. Suggestions for improving the process for becoming an IPAWS alerting authority

Theme	Comment(s)
Message content/length	<i>“Changing the default FEMA IPAWS messages to something the public understands.”</i> <i>“Increasing the character limit even slightly.”</i>
Coordination/communication among authorities	<i>“I can not [cannot] certify the Information Security requirement (for the individual Alerting Authorities) when they are employed by another jurisdiction (i.e., — County can not [cannot] certify compliance by a City employee). But I think you mean FEMA’s MOU process in general.”</i>
Improved training	<i>“Better training by state for County Emergency Managers. The IPAWS online training is limited. Individual agencies struggle with the integration of the technology with EAS and vendor-based ENS systems.”</i>

Non-IPAWS Alerting Authorities

This section reports results for participants from jurisdictions that are not IPAWS alerting authorities.

Emergency Alerting Practices

Participants in non-IPAWS alerting authorities were asked about systems or tools their jurisdiction currently uses to alert the public. The most frequently reported systems/tools were traditional news media outlets and reverse 911 systems (see Table 12). Responses from AAs are included in the table for comparison purposes. Relatively large differences were observed for EAS, SMS (mobile), and social media channels with AAs reporting higher use of these systems/tools than Non-IPAWS alerting authorities.

Table 12. Non-WEA alerting systems/tools used by AAs (n = 19) and Non-IPAWS alerting authorities (n = 21)*

Alerting System/tool	Non-IPAWS alerting authorities	AAs	Difference
Traditional news media outlets (e.g., television, radio)	85.7%	84.2%	-1.5%
Reverse 911 Service	85.7%	78.9%	-6.8%
Social Media (Twitter/Facebook)	66.7%	89.5%	22.8%
E-mail	52.4%	68.4%	16.0%
Emergency Alert System (EAS)	47.6%	94.7%	47.1%
Changeable message signs	42.9%	52.6%	9.8%
Nixle.com	38.1%	31.6%	-6.5%
Emergency Digital Information Service (EDIS)	28.6%	15.8%	-12.8%
SMS (mobile)	23.8%	52.6%	28.8%
Sirens	23.8%	42.1%	18.3%
National Warning System (NAWAS)	23.8%	36.8%	13.0%
Other	9.5%	10.5%	1.0%

*Participants could choose more than one answer, so percentages sum to greater than 100%; red text reflects differences of 20% or more between AAs and non-IPAWS alerting authorities

IPAWS Plans

In this survey section, participants in non-IPAWS alerting authorities were asked several questions about their plans for becoming IPAWS alerting authorities.

Participants were first asked if their jurisdictions intended to apply to be an IPAWS alerting authority within the next 12 months. Most of the 21 participants responding to this question did not know if their jurisdictions intended to apply to become an IPAWS alerting authority (57.1%, n = 12). Among those that provided a definitive “yes” or “no” answer (n = 9), all but one indicated that their jurisdiction did intend to become an alerting authority. The participant reporting that the jurisdiction did not intend to

become an alerting authority cited lack of funding, lack of familiarity with WEA, and a lack of familiarity with the process of becoming an IPAWS alerting authority as the reasons for this decision.

Non-IPAWS alerting authorities were next asked what circumstances would make it more likely that that their jurisdictions will apply to become an IPAWS alerting authority. (For a complete list of comments see Appendix B.)

Question 1.26.) Participants indicated that training/education opportunities, funding, and improved geographic targeting would increase the likelihood of their jurisdictions becoming alerting authorities.

Table 13. Factors increasing the likelihood of a jurisdiction applying to become an IPAWS alerting authority

Theme	Comment(s)
Training/education	<p><i>“Better understanding of what it is and how it can be used. Most alerts sent by Kern are originated at NOAA Hanford.”</i></p> <p><i>“More knowledge and awareness of the program.”</i></p> <p><i>“Training is number one, I know a little about IPAWS, but would prefer a detailed face-to-face workshop, on what it is, what it can do, and how to use the system. I am not sure if we would need additional staff or funds until I fully understand the system. Do we need to maintain the system on a daily, weekly, monthly, or yearly schedule?”</i></p>
Funding	<i>“Funding.”</i>
More precise geographical targeting	<i>“Being able to subdivide the county into smaller units which would receive the alert specific to that area. Los Angeles County is to [too] geographically diverse for there to be much applicability of a ‘county-wide message’. 4083 sq. miles. 11M people. 140+ spoken languages. A tsunami warning for the coast would be received by residents of the high desert.”</i>

Finally, participants were asked what type of assistance would help their jurisdictions to complete the process of becoming an IPAWS alerting authority. Almost all participants reported that training would be helpful, and a majority also indicated that funding and additional staff would help them in the process (see Table 14).

Table 14. Assistance for becoming an IPAWS alerting authority (n = 19)*

Type of Assistance	Frequency	%
Training	17	89.5%
Funding	10	52.6%
Additional staff	10	52.6%
Other	1	5.3%

*Participants could choose more than one answer, so percentages sum to greater than 100%.

Summary

Recall that the survey results were intended to (1) identify potential improvements in the WEA system, (2) develop training for public safety officials regarding IPAWS/WEA, and (3) provide assistance to help jurisdictions complete the process for becoming IPAWS alerting authorities. This section will discuss prominent survey findings and make recommendations with respect to these issues. First, however, a number of limitations on the current findings should be noted.

Limitations

Findings from the present study are limited in several ways. First, participants were volunteers and while the response rate ($40/58 = 69\%$) was not unusually low, it was substantially less than 100%. Therefore, survey participants were a convenience sample, and the degree to which the results represent all CA counties is unknown. If for example, jurisdictions that did not respond to the survey are those that tend to be less interested in IPAWS or WEAs, then some results concerning the interest in becoming IPAWS alerting authorities may be overly optimistic.

Second, in a number of cases relatively few participants provided answers to open-ended questions. Moreover, responses that were provided were typically quite brief. As a result, it was difficult for the researchers to completely address all survey objectives. For example, relatively little was learned about the specific training needs of CA public safety officials with respect to IPAWS.

Finally, since participants provided their contact information, the survey was not anonymous and some criticism of the IPAWS and/or WEA systems may have been withheld as a result.

Discussion

The results are discussed below first for participants in jurisdictions that are not currently authorities, and then for those that are.

Increasing IPAWs WEA Registration

Approximately half of survey participants were in jurisdictions that are not IPAWS alerting authorities, and the results suggest that these jurisdictions are interested in and open to becoming alerting authorities. For example, 8 of 9 participants that knew their jurisdiction plans reported that their jurisdiction was planning to become an alerting authority. Moreover, the most frequently requested form of assistance was general training on the system. This result indicates that one primary reason that jurisdictions have not become alerting authorities is a lack of awareness of and familiarity with the system, rather than a specific objection to becoming an alerting authority.

On the other hand, additional funding and staff were also frequently requested forms of assistance that would help jurisdictions become alerting authorities. These would appear to be more difficult challenges to overcome.

WEA Use and Implementation

For those jurisdictions that are authorized alerting authorities, clear patterns were observed with respect to both the issuing of alerts and the implementation of the system. First, with regard to use of WEA alerts, nearly all AAs have staff trained to issue WEA alerts. Despite this, a very large majority of AAs have not actually issued a WEA alert in the past 2 years. This cannot be accounted for by a lack of training (nearly all AAs have staff trained to issue WEA alerts). Neither can it be explained by a lack of events requiring emergency alerting, since about 84% of AAs had issued at least one emergency alert in the past 2 years. Nevertheless, only about 26% of jurisdictions had issued an alert using WEA during this same time period.

Similarly, efforts with respect to system implementation have been minimal. For instance, most jurisdictions have either made no arrangements with other jurisdictions to coordinate the use of the WEA or have made only informal agreements. Moreover, very few jurisdictions are testing their WEA alert system. While a small number conduct tests annually, most have not tested at all. One reason appears to be that jurisdictions have not taken the necessary steps to be able to test the system (i.e., finalizing procedures, integrating WEA testing into their testing rotation). Finally, fewer than half of jurisdictions have conducted campaigns to educate their communities about WEA alerts.

This last result may be particularly unfortunate, as both reports from emergency management personnel and the results from informal social media surveys indicate that public awareness of WEA is very low (as of third quarter 2012 or about three months after the system was declared operational). For example, alert originators (e.g.

National Weather Service, state and local emergency managers, etc.) at a forum held early in 2012 reported that the public in their jurisdictions had little awareness of WEA. An informal survey of social media responses to recent WEA messages issued in Pennsylvania, New York, New Jersey, and other states indicates that many members of the public are surprised when they receive extreme weather alerts on their mobile phones.

In short, not only have most jurisdictions that are IPAWS alerting authorities chosen not to issue WEA alerts, they also appear to be expending only minimal effort to fully implement the system in terms of testing, coordinating with other jurisdictions, or educating the public about the system. These results suggest that use and full implementation of the WEA system is simply not a high priority.

Challenges with and Improvements to WEA

What accounts for the infrequent use of WEA alerts and the rather incomplete implementation of the system among most AAs? After all, these jurisdictions have taken the trouble to go through the process required to become IPAWS alerting authorities, have obtained the necessary hardware/software, and trained staff members to use the system.

The survey results quite clearly point to two primary perceived challenges with WEAs. First and foremost is a lack of precision in the geographical targeting area of the alerts. Specifically, participants

reported that having to target an entire county with a WEA alert is not a useful way to alert the public. This aspect of the WEA system appears repeatedly in participant responses and is in more than one case the most frequently mentioned aspect of the system. On one hand, this factor was reported as the primary reason for not yet using the WEA system, and the most frequently reported challenge of using the system. Conversely (and not surprisingly) allowing more precise targeting was recommended as a way to make WEAs both easier to use and was the most frequently mentioned suggestion for making WEA alerts more effective.

The second prominent cross-cutting factor concerned WEA message content and length. Participants repeatedly commented throughout the survey that the number of characters (90) allowed for WEA messages is too few. It was for instance the second most frequently mentioned challenge with the system. Increasing the number of characters was repeatedly recommended as a way to make WEA easier to use and more effective. While not as prominent, improvements to the content of WEA messages were also suggested frequently. These improvements included adding languages, adding voice capability, and ensuring that messages are more easily understandable by members of the general public.

Recommendations

IPAWS Registration, Use, and Implementation

To increase IPAWS registration among jurisdictions, ORAU recommends promoting and disseminating current training resources to non-IPAWS alerting authorities. In addition, CAL OES should also consider conducting webinars and face- to face trainings for jurisdictions in CA to encourage participation in IPAWS.

To encourage use among current AAs, ORAU encourages CAL OES to convene a meeting of current AAs to further explore their challenges and coordination issues regarding IPAWS and WEAs. In addition, CAL OES should examine solutions regarding the perceived limited message length and imprecise targeting of messages. CAL OES should also consider providing training to current AAs on IPAWS/WEA testing procedures. Finally, CAL OES should continue to promote the IPAWS and WEA systems to the public and consider conducting a larger state-wide public education campaign (since most counties have not conducted a campaign and may not have the funding available to do so).

Suggestions for Future Research

Additional work is needed to identify and address remaining barriers to greater use of IPAWS and WEAs. Therefore, ORAU recommends conducting interviews with selected survey participants to:

- Explore differences between alerting authorities who have used WEAs frequently and those who have not used WEAs, or have used them infrequently;
- Develop a deeper understanding of the assistance needed among jurisdictions that are planning on becoming an IPAWS alerting authority; and
- Identify specific training/education topics desired by current and future IPAWS users.

ORAU also recommends conducting an evaluation regarding the use of IPAWS and WEAs during the recent earthquake in California. It would be important to conduct this evaluation relatively soon while the event is still top of mind for public safety officials and members of the general public. This real world situation would allow CAL OES to further develop their understanding of IPAWS and WEA utilization. ORAU has assisted CDC with similar evaluations of their emergency response during outbreaks such as Middle East Respiratory Syndrome (MERS) and Ebola.

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ORAU has also conducted several large social marketing campaigns funded by the CDC to encourage the public to promote healthy behaviors such as vaccinations and could assist with the state-wide public campaign regarding the IPAWS/WEA systems.

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