NSDI 2010 CAP GRANTS

CATEGORY 6- FINAL REPORT

ENHANCEMENT OF THE GEOSPATIAL DATA MODEL ADOPTION FOR EMERGENCY RESPONSE

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Executive Summary

In 2010, CalOES, in partnership with the Homeland Security Regional Technology Center (RTC) at San Diego State University, was awarded a USGS National Spatial Data Infrastructure (NSDI) Cooperative Agreement Program (CAP) grant in support of the Federal Geographic Data Committee (FGDC). Changing technology, economic conditions, and competing priorities have necessitated many changes to this project over time, however, this report represents the state-of-the-art art in the application of geospatial information to incident management.

The report describes the adoption of UICDS, the Unified Incident Command Decision Support middleware to achieve geospatial data sharing and interoperability in the emergency management environment. UICDS has emerged as a national standard, developed by the Department of Homeland Security, Directorate of Science and Technology, which occurred at the same time that DHS stopped support for the GeoData Model (GDM) and the San Diego Regional Technology Center was dissolved due to lack of funding. Thus, while this project did not take the path that was originally proposed, the result is a cutting edge description of the relationship and role of geospatial information in emergency management.

UICDS operates in the middle of a three-tier conceptualization of information exchange that includes a data layer, an integration layer, and a presentation layer. This project focuses at the interface

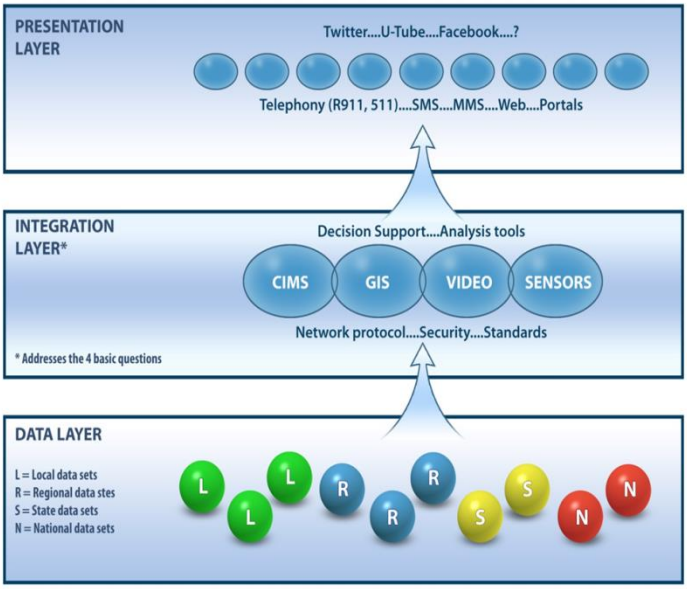
between the data layer and the integration layer – defining the data that is essential for integration and subsequent exchange among presentation layer applications. The data model presented in this report focuses specifically on the nexus of geospatial information and incident information.

The report consists of four sections:

Emergency Management Incident and Geospatial Data Model Concept

In considering the development of this data model to integrate into a single conceptual framework both incident information (generally textual, tabular, statistical, reports and logs) and geospatial information (well defined spatial elements consisting of points, lines, polygons, and geo-registered imagery with minimal textual content) were conceptualized as three levels of interaction that can be applied to most settings where data interoperability is desired in the emergency management space. The three layers comprising the framework include:

- Data layer - where all the various data sets and applications spread across various jurisdictions, agencies, or disciplines reside.
- Integration layer – where data is published into a web enabled internet protocol (ip) and standards based, open environment. Like data is aggregated and interoperability can then be achieved by connecting the various tools found in that layer.
- Presentation layer – where the integrated data is published to allow visibility across agencies/jurisdictions and disciplines by using a variety of distribution channels.



The Conceptual Interoperability Model. R.I. Desourdis and J. M. Contestabile, "Information Sharing for Situational Understanding and Command Coordination in Emergency Management and Disaster Response," IEEE International Conference on Technologies for Homeland Security November, 2011

We are here concerned, in this project, with the Data Layer but especially in the intersection between the Data Layer and the Presentation Layer, for that is where a data model is so important to allow the composition of data into information to be shared. Below we describe the Data Layer and then turn to the specific data model that we are adopting and adapting from UICDS to ensure the common presentation of geospatial information in the incident information context.

The Data Layer

At the bottom of this conceptual framework is the data layer where all the various data sets and applications spread across various jurisdictions/agencies/disciplines reside. Local data sets (for example, property patterns, zoning, locations of fire hydrants, school building plans, crime statistics, water supply and storm water systems, etc.), regional data sets (such as traffic network volumes, landfill information, wastewater treatment systems, etc.), state data sets (such as health records, social services, state roadway data, environmental information, etc.) as well as federal data sets (such as geospatial, aerial imagery, crime statistics, for a more comprehensive list of examples see: www.data.gov). While the location of this data can vary from place to place (that is, which agency or

jurisdiction is responsible), there is no doubt this data exists in every location and that some agency is responsible for creating it, tracking it, and maintaining it for some legitimate business purpose.

Typically, these systems lie behind agency firewalls, are built with some level of customized code (even if off-the-shelf software/applications were used), and are designed for agency use, not designed to share information with others outside the agency. In fact, Chief Information Officers (CIO's) of these agencies are often unwilling to share information from these systems to others outside the firewall because of costs and legitimate security concerns.

The key, we believe, to employing all the varied data into the incident management and response space is the data model that will then be exposed to and used by the Interoperability Layer, thus enabling effective use of geospatial and incident information for crisis decision-making.

Below we draw on the UICDS data construct and elements to compose what we are calling the Geospatial Data Model for Emergency Management.

The Geospatial Data Model for Emergency Management

The geospatial view of incident management is a very important way to visualize the relationship of a hazard, the impacted people and facilities, the responding resources, the supporting public welfare, and restoration actions. Common Operating Picture (COP) is frequently the name given to this type of depiction.

But geospatial information is only a fraction of all the information we call incident information. Thus, the essence of making good emergency response decisions will be found in the ability to seamlessly integrate geospatial information into the complex of incident information.

We will begin with the fact that just about everything has a geospatial reference, but that doesn't make everything geospatial information.

This data model derives from the UICDS middleware. UICDS is designed to help manage information sharing among all that "other" information in conjunction with geospatial information where such plays a role in the emergency decision. Together, geospatial as part of incident information represents the collaboration necessary for responding to an incident. The collaboration process of incident management employs reports, documents, forms, textual data, long descriptions, photographs, video, and many other types of information. And while any of these may have a geospatial reference - for example, a video is taken by a camera at a location or a description of a building is written, and the location of both can be placed on a map - it is the video, or the report, or the form that is the important content. The location is a useful reference, on the COP, but without the accompanying descriptive information one is missing meaning.

Furthermore, all that "collaboration" information is highly interactive. There might be 100 exchanges of data about a fire in a building - yet the building is depicted as a point on a map, maybe with a fire icon. The important context of the 100 exchanges is missed by using only the geospatial view. If they are not necessary to a decision, that is fine. But if you are managing that fire, those 100 exchanges are the critical "collaboration" information that gets the fire put out as fast as possible.

Thus, it is important to recognize the value of a geospatial COP to depict the incident and the value of collaboration information to manage the incident. And it is even more important to recognize the value of bringing collaboration and visualization together using what in UICDS is called Common Operational Data.

Common Operational Data

What is Common Operational Data? This question is akin to asking what data is needed during an emergency. While one cannot give a complete answer due to the unique information sharing needs of each incident, there are certain information needs which are almost always required. Typically, the following questions need to be answered throughout the course of most any emergency:

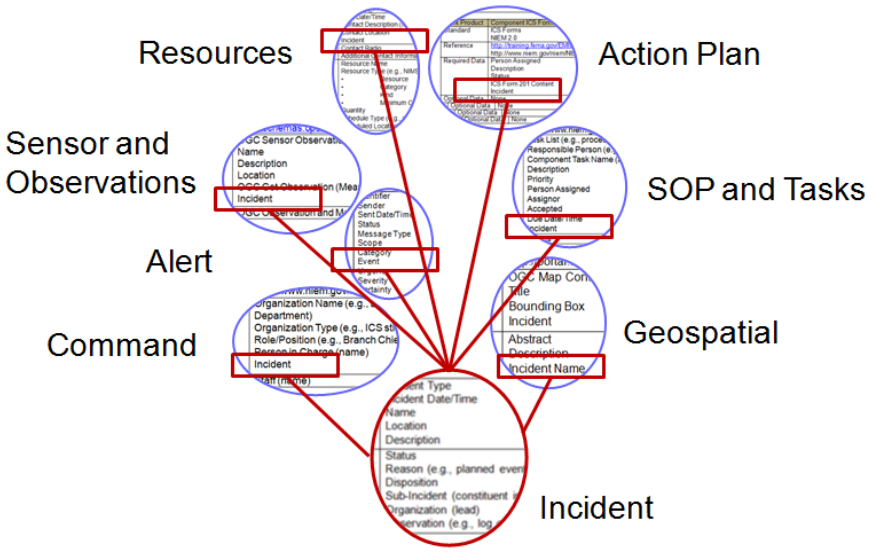
- What is it? Incident management means keeping multiple agencies informed

- Where is it? The geospatial view of the incident and the organizational response
- Who's in charge? Organizing incident command or emergency support function as defined by the ConOps
- Who should know? Alerts from one authoritative source sending to many
- What's the impact? Understanding the environment by sharing data from sensors, cameras, models
- What is the response? Resources employed, operating procedures followed, tasks performed
- What's happening? Situational awareness or common operating picture aggregating many sources into one for a shared view
- What's next? Action plans coordinated through the Incident Command System

Employing these questions for an emergency management data model that includes the rightful place for geospatial information (Where is it?) is our starting point.

The Emergency Management Data Model

The goal of the Geospatial Data Model for Emergency Management is not to create a separate data model. Rather, it is to create a unified data model that helps manage incident content collaboration, and associates both non-geospatial and geospatial information from the mass of data, that which is relevant to a specific incident. We draw on the UICDS data exchanges because UICDS translates non-geospatial data into geospatial formats as a byproduct of creating the collaborative information sharing among incident management applications which is its goal as information exchange middleware.



The Emergency Management Data Model includes the key element of Geospatial information along with seven other critical elements of emergency management information which are, by and large, not traditionally considered "geospatial" but all of which either have or can impute a geospatial component to their definition.

The illustration depicts a set of high-level data sets that answer the questions of Common Operational Data. Our lesson here is that ***emergency management data consists of non-geospatial and geospatial data and the effective data model integrates both while imparting to non-geospatial data a geospatial reference so that it can be utilized in emergency management decision-making.***

In the sections below, we will examine the content of these data sets as candidates for the data model for geospatial inclusion in emergency management.

Incident Data

Incident Data defines an incident. NIEM is the National Information Exchange Model and the data elements below are constructed using the NIEM incident description. Two other standards that create data about an incident are common and are included in this Incident Data. The Common Alerting Protocol (CAP) is one such standard and from the law enforcement community. The Law Enforcement Information Technology Standards Committee (LEITC) has a standard for computer-aided dispatch incident data exchange. Our data elements are modeled on UICDS which takes the CAP and the LEITSC formats and converts them into NIEM incidents for distribution through UICDS. The required and optional data elements for Incidents are shown below.

Required Data	Incident Type Incident Date/Time Name Location Description
Optional Data	Status Reason (e.g., planned event) Disposition Sub-Incident (constituent incidents) Organization (lead) Observation (e.g., log entries date/time stamped)

Standards: NIEM 2.0, CAP version 1.1 specification, LEITSC IEPD 1.1

Alert Data

Alert data is defined by the Common Alerting Protocol (CAP) specification. The required and optional data elements for Alerts are described below.

Required Data	Identifier Sender Sent Date/Time Status Message Type Scope Category Event Urgency Severity Certainty
Optional Data	Source Restriction Addresses Code Note

	References Incidents Language Response Type Event Code Effective Onset Expires Sender Name Headline Description Instruction Web Contact Parameter Resource Area

Standard: EDXL Common Alerting Protocol

Geospatial Data

The goal with geospatial data is to allow applications to associate GIS information with an incident and to view GIS information that has been provided by other clients. This allows clients to obtain geospatial data in standard formats from the originating source application in order to create map visualizations using the clients own geospatial application. The operationalization of this in UICDS, our exemplar for this approach, is the Open Geospatial Consortium Web Map Context document. Map Context directs the client application to a layer of geospatial data from a specific standards-based service. The required and optional data elements for the OGC Map Context are described below.

Required Data	OGC Map Context (composed of Layer Data WMS and/or WFS URL) Title Bounding Box Incident
Optional Data	Abstract Description Incident Name
	Multiple Layer Data (Repeat as needed for complete picture)
Required Data	OGC Web Map Service or OGC Web Feature Service URL Name Title Incident
Optional Data	Incident Name Abstract

Standards: WMS 1.3.0, WFS 1.1, GML, OGC Web Map Context 1.1.0

Command Data

This set of data allows creation of an Incident Command System (ICS) structure and Multiagency Coordination System (MACS) structure for incidents by associating people with organizational roles. The required and optional data elements are described below.

Required Data	Organization Name (e.g., Emergency Management Agency or Public Works Department) Organization Type (e.g., ICS structure for this incident or ESF-1 or Backhoe) Role/Position (e.g., Branch Chief or Transportation Officer or Dikes) Person in Charge (name) Incident
Optional Data	Staff (name)

Standard: NIEM 2.0 (derived from NIEM ComplexObjectType)

Standard Operating Procedures and Tasking Data

This set of data provides a list of Standard Operating Procedures and task status. The required and optional data elements are described below.

Required Data	Task List (e.g., procedure consisting of Component Tasks to be performed) Responsible Person (e.g., for the procedure) Component Task Name (a unique identifier) Description Priority Person Assigned Assignor Accepted Due Date/Time Incident
Optional Data	Status

Standard: NIEM 2.0 (derived from NIEM ComplexObjectType)

Resource Management Data

The purpose of Resource Management Data is to allow Resource Management Applications to communicate with other Resource Management Applications using the Emergency Data Exchange Language Resource Messaging standard. Adopting this structure for our data model allows for sharing of resource status among applications using two primary requirements: Resource Requests and Resource Commits. Each of the Request and Commit data sets consist of two components, the

requestor/committer data and the resource data. The required and optional data elements for Resource Management Service are described below.

Required Data	Sent Date/Time Contact Description (freeform text) or Contact Role (in request process) Contact Location Incident
Optional Data	Contact Radio Additional Contact Information (name, address, etc.)
Multiple Component Resources Required Data	Resource Name Resource Type (e.g., NIMS Resource Typing Element) • Resource • Category • Kind • Minimum Capabilities Quantity Schedule Type (e.g., send, receive, date/time) Scheduled Location
Multiple Component Resources Optional Data	Keywords Description Credentials Certifications Special Requirements Restrictions Anticipated Function Responsible Party Ownership Resource Status Accept/Decline Reason

Standards: Resource Messaging (EDXL-RM) 1.0, Distribution Element (EDXL-DE) 1.0

Sensor Data

This set of data employs the Open Geospatial Consortium Sensor Observation Service and consists of the Sensor Observation Information (SOI) standard. The discovery process to identify sensors that are relevant to a particular incident (as implemented in UICDS) involves interactions between clients and the sensor systems at several SOS levels. Clients who are interested in retrieving the sensor observations for a given incident request the data below from the UICDS Sensor Service (in the UICDS implementation) and use the retrieved information to request observations directly from the sensor system via the SOS interface. The required and optional data elements are described below.

Required Data	OGC Sensor Observation Service URL Name Description Location

	OGC Get Observation (Measurement Request from Sensor) Incident
Optional Data	OGC Observation and Measurement Result

Standards: OGC Sensor Observation Service (SOS) 1.0.0, OGC Observations and Measurements 1.0

Incident Action Plan Data

Planning for the next operational period is a critical part of incident management and is carried out using the data elements below which are derived from the Incident Command System which creates an Incident Action Plan (IAP). The IAP consists of an aggregation of data from several ICS forms which are treated as "component documents" in the IAP. Those component documents consist of the several ICS forms, each of which consists of the data contained on the ICS forms. The required and optional data elements associated with the Incident Action Plan are described below by making reference to the required ICS Forms.

Required Data	Name Description Effective Date/Time Expiration Date/Time List of Component Documents (ICS Form Work Products or other UICDS Work Products) Incident
Optional Data	None
Component ICS Form 201 -Incident Briefing	Date/Time Prepared Map Sketch Resources Summary • Resources Ordered • Resource Identification • ETA • On Scene • Location Assignment Summary Of Current Actions Current Organization Incident
Component ICS Form 202 - Incident Objectives	Date/Time Prepared Operational Period Contractor Objectives Weather Forecast General Safety Message Attachment List • Organization List • Assignment List

	• Communications Plan • Medical Plan • Incident Map • Traffic Plan • Weather Forecast Prepared By Approved By Incident
Component ICS Form 204 -Assignment List	Date/Time Prepared Branch Division Group Operational Period Date Operational Period Time Operations Chief Branch Director Division Group Supervisor Air Tactical Group Supervisor Resources Assigned Control Operations Special Instructions Prepared By Approved By Incident
Component ICS Form 205 -Incident Radio Communications Plan	Date/Time Prepared Operational Period Date/Time Basic Radio Channel Utilization • System Cache • Channel • Function • Frequency Tone • Assignment • Remarks Prepared By Incident
Component ICS Form 206 – Medical Plan	Date/Time Prepared Operational Period Incident Medical Aid Station • Medical Aid Station • Location • Paramedics Ambulance Services Incident Ambulances Hospitals Medical Emergency Procedures Prepared By Reviewed By Incident

Component ICS Form 207 -Incident Operations Plan	Branch Division Group Operational Period Date/Time Operations Chief Branch Director Division Group Supervisor Air Tactical Group Supervisor Resources Summary Resource Designator EMT Leader Number Persons Transportation Needed Pickup Point Time Drop Off Point Time Control Operations Special Instructions Prepared By Approved By Incident
Component ICS Form 209 -Incident Status Summary	Incident Date Time Initial Update Final Incident Number Incident Commander Jurisdiction County Type Incident Location Started Date Time Cause Area Involved Percent Controlled Expected Containment Date Time Estimated Controlled Date Time Declared Controlled Date Time Current Threat Control Problems Estimated Loss Estimated Savings Injuries Deaths Line Built Line To Build Current Weather WS Current Weather WD Current Weather Temp Current Weather RH

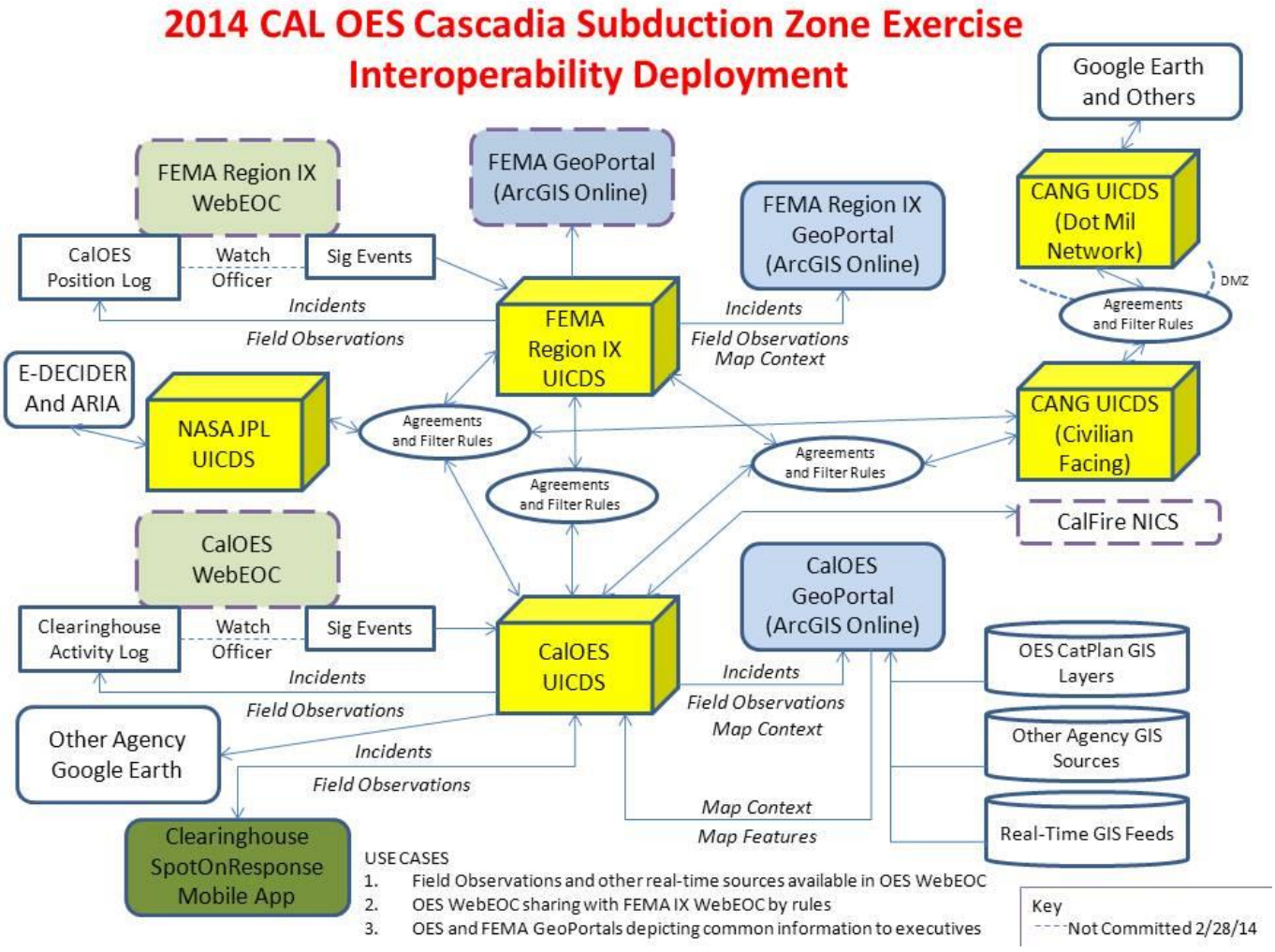
	Predicted Weather WS Predicted Weather WD Predicted Weather Temp Predicted Weather RH Cost To Date Estimated Total Cost Cooperating Agencies Remarks Prepared By Approved By Sent To Date Sent To Time Sent To By Incident
Component ICS Form 210 -Status Change Card	Designator Name I'd No Assigned Available OS Rest OS Mechanical OS Manning ETR From Division Group From Staging Area From Base ICP From Enroute From Home Agency Messages Time Process Incident
Component ICS Form 211 -Incident Check-In List	Start Time/Date Check In • Agency • Single • Kind • Type • I'd Name • Order Request Number • Date Time Check In • Leader Name • Total Number Personnel • Manifest • Crew Weight • Home Base • Departure Point • Method Of Travel • Incident Assignment • Other Qualifications

	• Sent To Restat Check In Location • Base • Camp • Staging Area • ICP Restat • Helibase Check In Resource • State • Agency • Category • Kind • Type • Resource Name/Identifier • ST or TF Prepared By Incident Number Incident

Standards: ICS Forms, NIEM 2.0

Looking Ahead to Operationalizing the Data Model

Presently, there are four other organizations that have been partners in developing the vision for data sharing and interoperability using UICDS. The figure illustrates the logical diagram that represents the general information flow from our partners that we have identified and the basic processes that will allow data sharing without having to standardize on a single data model or a common computing environment.



CalOES is providing additional funding to conduct more training on UICDS for the collaborative team, and a contract with SpotOnResponse to host the CalOES UICDS core for one (1) year. This core will be shared with CGS, and other State Agencies. FEMA and NASA/JPL have deployed cores, and CAANG will be deploying two cores: one in the .mil domain for their secure information, and one core in the .gov domain which will allow the sharing of information outside of their secure environment. This contract will also provide for the development of an adapter for WebEOC in order to publish or consume information, including non-geospatial data that is reported.

Each organization is also using various applications that will be used for data collection and/or creation that will be shared:

- CalOES UICDS Core:
    - ArcGIS, ArcGIS Online for Organizations, CalEOC, Next Generation Incident Command System (NICS), GeoCortex, CalSABER
    - CA Earthquake Clearinghouse Partners
        - CA Geological Survey (CGS) – SpotOnResponse, CalEOC
        - USGS – SpotOnResponse, ArcMap
        - Earthquake Engineering Research Institute (EERI), SpotOnResponse, ATC Forms
- CA National Guard UICDS Core:
    - Secure and public facing cores, ArcGIS, Google Enterprise, internal reporting systems
- FEMA UICDS Core;
    - WebEOC, ArcGIS
    - NASA/JPL UICDS Core
        - HAZUS reports, E-Decider, Advanced Rapid Imaging and Assessment (ARIA)

Over the next year, we will continue to build, test, and make available a geodatabase of incident information for an EOC environment. Instead of being able to build and test it in SQL Server as originally planned, we will make the geodatabase available through CAP Grant website as part of this project once we are able to test it within the context of sharing via UICDS and WebEOC.

Project Chronology and Narrative

In 2010, CalOES (then CalEMA) submitted a project proposal on behalf of San Diego Regional Technology Center for the CAP 2010, Category 6 – Enhancement of the Department of Homeland Security (DHS) Geospatial Data Model (GDM) and Adoption for Emergency Response. The goal of the original project was to enhance the adoption of the GDM by jurisdictions and agencies throughout the State by migrating CalOES's GIS file structure of data used for emergency management to the GDM by staff at the RTC. The migration would have been accomplished by taking CalOES's existing directory structure of information and cross-walking it over to the GDM using the Schema Generation Tool (called GDM-O-Matic) that was created by DHS for this purpose.

Shortly after the award, DHS discontinued support for the GDM. After many discussions, DHS worked with us to continue as planned; they would send the application server that housed the DHS application for our use. Approximately 8 months later, the server arrived, but it was damaged beyond our ability to resurrect it. The original grant period expired in April 2011. A time only extension was requested and received by CalOES. We continued to work with the RTC to redefine the project deliverable to modeling only incident related information. However, in August 2011, we received notice from the RTC that they were being defunded and dissolved. CalOES did not receive any completed deliverable from the RTC. Unable to perform the work ourselves, we contacted the CAP Grant Coordinator to explain the situation and request advice on how to proceed. It was agreed that CalOES could use the grant funds for training and travel in order to gain the requisite skills to model the incident data, and build and test a multiuser geodatabase in SQL Server. GIS staff took ESRI courses for deploying ArcGIS Server, development of a multi-user geodatabase using SQL Server, and updated ArcGIS workflows, analysis, and geoprocessing in ArcGIS 9.3.

At this time, the GIS Unit was working with the CalOES IT department who had planned to provide an enterprise GIS development environment within which to deploy ArcGIS Server, and an instance of SQL Server in which to create the geodatabase. Technical issues and changing IT priorities delayed progress, and the expected environment was never developed for us to perform the required tasks.

In July 2012, another significant event occurred within CalOES that impacted IT's ability to provide us with the GIS Enterprise environment. An information technology project was kicked off to implement WebEOC™, and IT was redirected to make infrastructure improvements to support it. Currently, the integration of GIS and the information reporting from WebEOC is not fully realized. The application does not easily share information geospatial information, and the process of getting data out of WebEOC will have to be a manual one. Another challenge with WebEOC is that the map viewer, called Mapper, is not robust enough to use as a platform for situational awareness, data sharing, web service consumption or storage. Amidst the various challenges, our period of performance was once again missed, and we were granted another time only extension.

Within the WebEOC proposal, there was a requirement for UICDS (Unified Incident Command Decision Support). UICDS is a standards-based middleware that exposes select data from commercial and government applications, and allows users to subscribe to relevant information for use in their own environment. Other types of data, such as sensors, video feeds, alerts may also be

published to provide a portion of their data to UICDS. It is then published to subscribers' application formats and be consumed in the subscriber's own applications. To the user, there is no new application to learn, and with sharing agreement in place, no conscious sending of information to subscribers is done. We quickly realized that this technology could be leveraged provide the solution for data sharing and interoperability, independent of the data structure, source or format. More information on UICDS can be found at www.uicds.us .

As part of this ongoing effort, we have been working with the California Earthquake Clearinghouse (CEC), leveraging our partnership with them as a managing partner to test the viability of using UICDS to take scientific field observations, push selected incident related information from WebEOC through UICDS and ultimately to a map viewer. To date, two Clearinghouse partners have already deployed UICDS cores, along with the UICDS technical team from Leidos, and have successfully shared data in four of six exercises. Our next target is the Cascadia Catastrophic Earthquake Exercise in May of 2014. More information about the CA Earthquake Clearinghouse can be found at: http://www.californiaeqclearinghouse.org/ .

In July 2012, ESRI released ArcGIS Online (AGOL) for Organizations. We have been able to procure this "software as a service" (SaaS), and are currently using it as the platform for situational awareness maps, a place to create public map services that can be shared outside of our firewall and a viewer for data that can be publicly shared though with UICDS.

By combining these various initiatives, we now a final plan to achieve the grant project goals. The final extension date of December 6, 2013 culminated in technical training and mentoring by the UICDS technical team to deploy UICDS, and use in conjunction with WebEOC for reporting incident, and display a map of these reported incidents in AGOL. The UICDS training was attended by staff from CalOES, the California Geological Survey, (CGS) and FEMA. (A CA Army National Guard (CAANG) representative was unable to attend.) One of the outcomes of the training was that in order to consume information from UICDS to AGOL, a UICDS adapter for ArcGIS Online needed to be developed to allow information coming from CGS, WebEOC, FEMA and CAANG to be consumed in ArcGIS Online. CalOES provided funding to develop this adapter. In the course of this development, ESRI is now working independently with the UICDS team to add additional capabilities to the adapter. This adapter will be made it available on the ESRI Marketplace as a template for anyone to download and use. We will notify the Cooperative Agreement Grant program when it becomes available.

NSDI CAP Feedback

1. **What are the CAP Program strengths and weaknesses?**

   The strength of the program is providing funding for small, focused projects that GIS units and/or professionals can supplement their regular job functions. Although our project went terribly awry, the excellent staff and flexibility of the program kept us motivated and moving forward to completion. I think that speaks very highly of the program itself. I would say that there are no weaknesses from my perspective.

2. **Where did it make a difference?**

   I think that, although we had a rough go of it, the CAP grant provided us with tools and training to accomplish our goals related to the development of an Enterprise GIS, and training to achieve it.

3. **Was the assistance you received sufficient or effective?**

   The assistance from the grant staff was incredible. We had so many misfortunes and problems, but they were always there to talk with, work with, and discuss solutions. They made the process so much easier to handle.

4. **What would you recommend that the FGDC do differently?**

   I can't think of anything that could be done differently. The program was clear in its objectives, and was useful in furthering our GIS Enterprise objectives, while aligning with the Federal objectives. And again, the staff was outstanding to work with.

5. **Are there factors that are missing or are there additional needs that should be considered?**

   Not from my perspective

6. **Are there program management concerns that need to be addressed, such as the time frame?**

   The timeframe is okay, as long as there is the ability to be flexible and provide the extensions. Our grant was unusual in that it morphed over time due to things out of our control, but with the extensions and flexibility of the program, we were finally able to produce results of value.

7. **If you were to do the project again, what would you do differently?**

   First of all, I wouldn't submit on behalf of someone else. This was the thing that caused most of the grief we experienced. With more experience, I would make sure that I had a "shovel ready" project upon which to apply funding. The way this grant turned out, we have a good road map that can be used by us or to others interested in collaborating with us and the emergency management community in CA. and possibly beyond.