

DRAFT Standard Operating Guidelines for GIS Specialists

On Incident Command Teams

State of California

Department of Water Resources

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Executive Summary

In October 2010, the Emergency Response (ER) GIS Subcommittee of the Department of Water Resources Enterprise GIS Committee was formed with the mission of improving spatial data exchange during emergency response. The ER GIS Subcommittee learned from flood managers shortly after its formation that Standard Operating Guidelines (SOGs) were needed for ER GIS Specialists on Incident Command Teams. Creating these SOPs would have the benefits of (1) documenting the expectations of GIS Specialists and (2) providing guidelines for the best practices and resources available to serve those expectations.

The ER GIS Subcommittee developed these SOGs using the structure and some content of the National Wildlife Coordinating Group (NWCG) Geographic Information System Standard Operating Guidelines (GSTOP). However, as GSTOP was created for fire response, this document will serve the needs of GIS Specialists during flood response. These SOGs cover GIS data management, map production, incident GIS documentation and archiving, team transition, and general guidance for the GIS Specialist.

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Chapter 1 GIS Minimum Expectations

Purpose

This chapter outlines the minimum expectations for the GIS (Geographic Information System) Specialist on an Incident Command Team (ICT) in the Department of Water Resources, including:

- Knowledge and abilities required for GIS Specialist
- Procedures the GIS Specialist can be expected to follow
- Environmental considerations affecting the working condition during an incident or event
- Basic equipment needed for a GIS Specialist to function at a basic level--this may vary as the size and type of incident changes.

Critical Items for GIS Operations

Hardware

- PC or laptop with CD writer, USB ports, and 2 GB or higher of RAM
- Video/Graphic Adaptor 64 MB RAM minimum, 256 MB RAM or higher recommended {NVIDIA, ATI and INTEL chipsets supported}
- Printer with paper
- Connection cables, hubs, power supplies
- External portable hard drive (DSS offers these for loan)

Software

- ArcGIS 10 Desktop – Enterprise System
- Appropriate software extensions and tools turned on
- GPS download utility
- Adobe Acrobat 9 or later

Infrastructure

- Power to the work site
- Uninterruptible Power Supply (UPS) with battery backup—surge protection
- Internet connection and service

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Media

- USB thumb drive or jump drive
- Blank CDs or DVDs

Data

- Refer to Chapter 4 table

GIS Specialist Knowledge, Skills, and Abilities

As a prerequisite to service as GIS Specialist, personnel should have the following abilities and knowledge.

GIS Specialist must be able to:

- Effectively use ArcGIS 10 to create maps using Incident Command System templates and standard symbology, and perform spatial analysis as required for the situation.
- Work with a variety of spatial data types (raster and vector), including knowledge of various data file types such as coverages, geodatabases, and shapefiles.
- Answer questions such as: Where is the levee break? Where is the flood fight material?
- Troubleshoot hardware and software problems sufficient to keep the GIS Specialist operational. This may include basic computer installation, software management, and installing printer drives.
- Communicate effectively with internal and external people to the ICT:
 - Explain technical issues or concerns.
 - Train others in basic map reading.
 - Exchange technical information.
- Perform the role of GIS Specialist in “incident conditions” which may include the following:
 - Long hours (12-16 hour operational periods, day and night)
 - Close quarters shared with other personnel (Com trailer, fire station)
 - Stressful conditions
 - Travel away from home base for 14 days or longer
 - Primitive conditions (no toilets, no food)
 - Incident Command Center, may include federal agency, contractors, or prison crews

GIS Specialist must have knowledge of:

- The Incident Command System (ICS) structure and procedures, outlined in the self-study course on the FEMA website:
<http://www.fema.gov/emergency/nims/NIMSTrainingCourses.shtm>
ICS-100, ICS 700

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- Knowledge of the organizational structure and whom to go to for issues or support
 - Familiarity with ICT operations
 - Understand general expectations of the ICT Director or IC Planning Chief
- in addition, the DWR Incident Command System Field Operations Guide 420-1/P.
- Understand Global Positioning System (GPS) data collection methods and be able to download, process and incorporate the data.
 - Understand the use of projection and datum including geographic coordinates (latitude and longitude) and be able to re-project data in multiple formats.
 - GIS Specialist must understand that people and property is the first priority of the ICT. The commitment to and accountability for safety is the responsibility of all ICT members.
 - The GIS demands on an incident are independent of the complexity level of an incident. It is possible to have a very complex GIS situation with an incident of minimal complexity.

Incident Procedures

At the first notification of possible activation:

- Prepare to be self-sufficient; you will have to bring a GIS laptop, external drive and all software, common templates, and common base data with you. Coordinate with your ICT's command and logistics staff.
- Recognize that a plotter or printer may not be immediately available; prepare preprinted paper maps of the affected area to make available to IC staff.

Setting up the GIS operations and running through the first operational period:

- Check in following incident check-in procedures
- Conduct a briefing with the Incident Command (IC) Planning Section Chief to establish location, rules, and expectations, as well as, planning a timeline for map production
- Analyze the data, hardware, personnel, and supplies available. If additional hardware, supplies, or personnel are needed for effective GIS productivity, follow ordering procedures. Orders for GIS are submitted through the IC Planning Section Chief to the Logistics Section.
- Set up computer, workspace, and map display.
- Set up the file directory structure as outlined in Chapter 2.
- Initiate Unit Log, ICS Form 214 (Appendix B) in accordance with Chapter 3.
- Insert base data into directory structure.
- Establish coordinate system and units standard for the incident data.
- Establish boundary of the incident's area of interest.
- Gather what incident data you can; collect hard-copy maps already in use.

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- Generate map products according to the SOP for Standard Map Products and the Incident Command timelines and priorities.

Responsibilities

The GIS Specialist is responsible for the following:

- Collecting, processing, and disseminating incident-related spatial data
- Maintaining the standardized filing structures (Chapter 2)
- Collecting and maintaining the Minimum Essential Datasets (Chapter 4)
- Creating new data as needed for incident operations
 - Incorporating data from Geographic Positioning Satellite (GPS), phones, and other sources
 - Digitizing flood inundation perimeter and other incident data
- Creating necessary products (Chapter 6) using the defined Map Symbology (Chapter 5) within the agreed upon time
- Properly documenting data and archiving work (Chapter 3; Chapter 7)
- Compliance with security data management agreement (Chapter 3; Chapter 7; Chapter 8)
- Transferring the products, projects, and data created in GIS to other personnel on the incident or to the Flood Operations Center (FOC)
- Complying with demobilization procedures
- Keeping informed of any known hardware, software, or data difficulties and concerns in the log
- Providing maps as requested by the Planning Chief

With regard to the GIS Specialist, the Planning Chief is responsible for the following:

- Directing and prioritizing all tasks of the GIS Specialist, allowing for individual strengths
- Coordinating and prioritizing incoming requests—especially those by public information officers, cooperators, and others
- Requesting map products
- Monitoring the workload
- Authorizing the uploading of field collected data
- Ordering the necessary equipment or people to accomplish the GIS work effectively (computer support, power, equipment)

Other personnel collecting geospatial data on the incident are responsible for the following:

- Knowing how to use the GPS units and having GPS cables available for uploading the data

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Communications

The GIS Specialist needs to maintain timely and effective exchange of information between the ICT Chief and all affected agencies and organizations. GIS specialist will maintain a professional demeanor when communicating with the incident personnel and technical staff from outside the incident. When communicating within the incident, GIS Specialist will follow the ICS chain-of-command at all times. Incident communications, such as requests for materials, maps, or information, are tracked using the ICS 213, General Message Form (Appendix A).

Whenever there is more than one GIS Specialist on an incident, one may be designated as the “lead” to coordinate and communicate with the Planning Chief/ICT Chief. Some Incident Command Teams have a designated GIS Specialist on their team; the ICT Chief may designate this individual as the “GIS Lead”.

Chapter 2 File Name and Directory Structure

Purpose

This chapter provides the GIS Specialists with guidelines for standardized file names and directory for GIS data and related documents created and used on incidents or events. The structure design will provide a consistent file naming and data structure that is repeatable, clear, and enables consistent archiving of incident geospatial data. The goal is to have a structure that leads to efficient work methods while allowing the field GIS specialist flexibility to meet the business needs of fieldwork in a timely manner.

The incident directory structure provides a framework for storing and using GIS data and documents. Ensuring that all incident GIS files are stored in the proper location within a standardized directory structure is important to ensure efficient workflow, reduces ambiguity, and enables the data archival process. This system will prompt communication by the Incident GIS Specialist to the Flood Operations Center and other organizations supporting the incident.

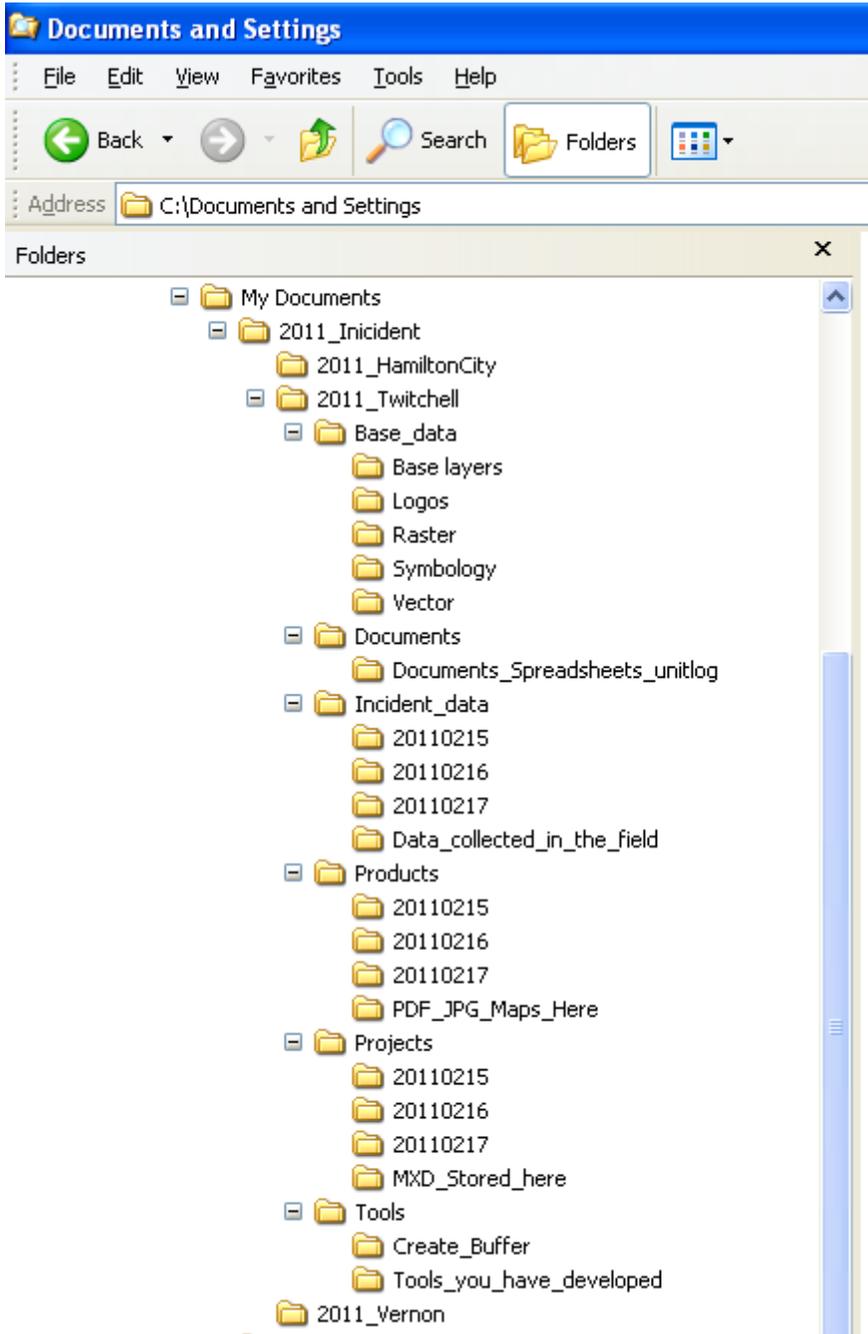
Specifications

The File Name and Directory SOP and Metadata SOP are designed so that the file and folder names include incident-specific identification information.

- File names cannot be longer than 255 characters. Note: long files more than 128 characters for path name may not allow backup onto CD
- File folder names must not contain spaces or periods, aside from the file extension delimiters
- File names for specific layers include descriptive data about the incident
- File names must be complete and stand on their own outside of the file structure

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Table 2.1 Sample Directory Structure



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Incident Directory Structure:

This structure can be stored in any location, however the following describes the core directories to be present for every incident and does not preclude other folders being added.

Note: According to agency needs, files for multiple incidents may be stored under a root folder named: yyyy_Incidents (at root level, where yyyy=the current calendar year)

yyyy_incident_name i.e., 2011_Twitchell, where yyyy=the year the incident started)

base_data - base data not created on the incident

- dem (digital elevation model data and derived products)
- logos (agency logos, typically in nongeospatial raster format)
- raster (other raster data such as orthoimagery or scanned quads)
- vector (vector data file types)

Documents – spreadsheet, text documents, unit log, digital photos used on maps, etc.

Incident_data - data created on the incident stored by date

- incident spatial data file – the master incident geospatial data file
 - yyyyymmdd – contain date/time stamped incident spatial data files based up from incident geospatial data file
 - gps – optional, contains GIS data from field GPS downloads
 - other optional folders – such as IR, FOC data
 - modified_based_data – base data edited for the incident, i.e., roads, ownership, and structures
 - progression – workspace to create progression of water, inundation
- Products – contains GIS product files produced on the incident

- yyyyymmdd – all products for an intended date of use versus the date created
- final – contains copies of all final products for the incident

Projects – GIS product tasks, daily map document files

- master map document files – the master map document files, one for each map product
- yyyyymmdd – contains backup map document files copied from master map document files

Tools – extensions, tools, or other software used on the incident

Responsibilities and Communications

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It is the responsibility of the GIS Specialist to communicate the file naming and directory structure used on an incident to other GIS Specialists.

The Incident Command Team (ICT) is responsible for ensuring only that GIS file naming and structure standards are in place for incident. This chapter specifies a Department of Water Resources Standard Operating Guidelines.

Common Abbreviations:

This is a list of standard abbreviations for file naming. For other features, select an unambiguous term.

Incident Data Types

damage = Damage caused by incident or response efforts

icp = Incident Command Post

ics_pt = ICS points symbolized with ICS symbology

Source Codes

gps_name = Global Positioning System (add collector's name) i.e., gpsjones

fobs = Field Observer

Coordinate System Codes (for shapefiles, not needed with file geodatabases)

(Coordinate system, datum)

u10n27 = Universal Transverse Mercator (UTM) Zone 10, NAD 27

u13n83 = UTM Zone 13, NAD 83

lln83 = Latitude-Longitude; i.e., geographic NAD 83

{ca}sp5n27 = {State abbreviation} State Plane Zone 5, NAD 27

cta83 = California Teale Albers, NAD 83

Product Type

brief = Briefing Map

dam = Damage Assessment Map

facil = Facilities Map

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iap = Incident Action Plan Map
owner = Ownership Map
plans = Situation-Plans Map
rehab = Rehabilitation
struct = Structural Protection Map
trans = Transportation Map

Page Orientation

land = landscape
port = portrait

Date Format

yyyy = Year in which the incident began, e.g., 2005
yyymmdd = Year, month, day, e.g., 20051207
hhmm = Hours and minutes, 24 hour clock, e.g., 0945

Responsibilities and Communications

It is the responsibility of the GIS Specialist to communicate the file naming and directory structure used on an incident to other GIS Specialists, including the hosting unit GIS staff and regional GIS staff.

The Situation Unit is responsible for ensuring only that the GIS file naming and directory structure standards are in place for the incident. This chapter specifies a national interagency standard, which should not be overridden at the incident level.

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Chapter 3 Documentation and Metadata

Purpose

These Standard Operating Guidelines outline the documentation an Incident Command Team (ICT) Geographic Information System (GIS) Specialist uses for data and metadata about the data created while in the field. This chapter provides procedures for further documentation aiding in the creation of the Department of Water Resources compliant metadata.

Specifications for metadata file naming

The following items are in Chapter 2:

- Date, including year (yyyymmdd)
- Time of data collection (hhmm, using 24-hour clock)
- Type of feature portrayed by the data
- Source of data (the ICT position or name of person who collected the data)
- Feature type (point, line polygon)
- Coordinate system
- Datum
- Incident name

Procedures

Documentation is kept on a Unit Log by units operating as the ICT. The log will track significant events that occur throughout the operational day. The log may be hardcopy or digital files with attachments.

Keep a log of events such as the arrival of data from the field, transition of personnel or data processing. Include one of each type of map produced per operational period. This provides a record of significant changes to the incident data and the products produced.

If base data are used or edited, then these base data become modified base data. At this time the GIS Specialist needs to fulfill the documentation requirements or metadata for these data.

Responsibilities

The ICT Commander or Plans and Intel Chief is responsible for ensuring that the GIS Specialist has the resources needed to fulfill the obligations to the Planning Section. The Plans and Intel Chief authorizes documentation and maps the GIS Specialist will provide to the ICT.

The GIS Specialist is responsible for providing documentation to the Flood Operations Center (FOC) and other agencies as directed.

Chapter 4 Minimum Essential Datasets

Purpose

This chapter will provide a list of the base datasets that have been identified as the “minimum essential datasets” needed to meet the business need to make GIS maps in the field. Then outline the process for obtaining datasets, evaluating, transferring data, and storing dataset during an incident/event.

In addition all GIS personal are encouraged to be self-sufficient. You may be working in adverse weather condition in an isolated part of the state. You will be responding to an incident and may be working alone for 12-48 hours.

Procedures

The Emergency Response Subcommittee (ERS) has identified minimum base datasets that will be available for GIS staff. The datasets are used to develop Standard Map Products (Chapter 6), to develop products upon demand, and to complete requested report maps.

This chapter distinguishes three classes of datasets:

- Required datasets for Standard Map Products (A)
- Required datasets for Optional Map Products (B)
- Optional datasets (C)

(See Table 4.1 Minimum Essential Datasets)

Each ICT GIS team member is responsible for setting up and maintaining their assigned computer equipment, data, and external drive. The ERS has identified minimum base datasets. The required datasets (A) will be on an external drive issued by the Flood Operations Center (FOC) Decision Support Section (DSS). Due to the need for rapid response all GIS Staff assigned to an ICT roster should have these datasets downloaded and available for use during Flood Season (Oct-May).

Staff are encouraged to download the data from Domain Water>GIS1>DATA>DWR_DATASET_SOP at the beginning of flood season. This will be updated before the beginning of flood season so watch for GIS updates.

Note: When working in the field, store all datasets locally (C Drive, external drive) for access and speed. Chapter 7 will outline archiving datasets after the incident. If the Incident Command Center (ICC) has internet access the same data will be stored on: Domain Water>GIS1>DATA>DWR_DATASET_SOP.

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The required datasets will be stored in the ISO-19 format the matrix of required datasets includes an index reference to the ISO-19 folder where dataset will be found.

GIS Staff is encouraged to keep their own datasets on their laptop or thumb drive being used during the event. The personal datasets should be reviewed to ensure that they will fall into the Optional Datasets C category.

Upon receiving orders for the GIS Specialist assignment staff should review APPENDIX A: LIST OF NECESSITIES FOR RESPONDING TO AN INCIDENT. This list was developed as a check list to assist you to be prepared during flood season. Then the GIS Specialist should contact the FOC DSS at (916) 574-2632 to obtain an external drive with GIS Data, the GIS Toolbox of preprinted maps, and miscellaneous equipment as The GIS Specialist should review the datasets to determine if they are adequate for use on the incident; this review should include the following elements:

Coordinate system and datum information

Datasets for DWR GIS field will be:

Y - Universal Transverse Mercator (UTM) Zone 10 and Zone 11

X - North American Datum (NAD) 1983

Z - Vertical datum or elevation was legislated to be North American Vertical Datum of 1988 (NAVD88)

The UTM coordinate system was developed by the United States Army Corps of Engineers in 1940. Currently the World Geodetic System or WGS 84 is used as the underlying model in the UTM coordinate system. Many GPS units default to the WGS 84 system. See Chapter ?? for how to load GPS data into your map.

Scale

For most maps the 1:24,000 should be used to show the Quad or predesigned map background at the optimum scale. This is a standard amongst various emergency GIS programs, i.e. GSTOP, Cal FIRE.

Currency

Use the datasets that were developed for the current water year. The FOC DSS will develop a new dataset each year.

Attributes

Datasets should contain meaningful attributes as per *Map Product and Deliverables Matrix* (Chapter ?). Use caution with datasets that do not have complete attribution.

Security of Data

Some datasets are considered “critical infrastructure” and should not be distributed. These datasets may have been obtained under an agreement to be used only on the incident and should not be publicly distributed. Please check the metadata for details.

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Responsibilities

The GIS Specialist works within the ICT team to obtain and provide data. This data will be in various forms, i.e. levee break coordinates, how to get to a levee break, reporting a levee break to the FOC. The goal is to be able to display the data or datasets on a map to assist all teams with providing support during an incident.

Communications

The GIS Specialist will facilitate the flow of data from the field to the command center and up to the Flood Operations Center. In turn as data is needed at the local ICT the GIS Specialist will call the FOC GIS for support.

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Table 4.1 Minimum Essential datasets for map procedures

Dataset	IAP Map	Situation/ Plans Map	Briefing Map	Transportation Map	ISO Index Where to find this data on the DWR GIS external drive
Class A- Base Map Data					
Base Map background	R	O	O	O	10_ImageryBaseMapsEarthCover (Subfolder) DeLorme_World_Basemap (Base_Map) Shaded Relief (Base_Map) World_Street_Map (Base_Map) USGS_Topo_7.5_minute_series (Quads)
Base Map Features					
Hydrography Rivers	R	R	R	O	12_InlandWater 17_Structure
Levee Centerlines	R	R	R	O	12_InlandWater 17_Structure
Roads	O	R	R	R	18_Transportation Local Roads Major Highways
Class B - Datasets alphabetical listing					
California Levee Database					12_InlandWater 17_Structures
City Boundary					03_Boundaries
County Boundary					03_Boundaries
Gauges					12_InlandWater 17_Structures
Hydrography Lakes Streams (See Structures)					12_InlandWater
Levee Miles					12_InlandWater 17_Structures
Local Area Maintenance					03_Boundaries

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Dataset	IAP Map	Situation/Plans Map	Briefing Map	Transportation Map	ISO Index Where to find this data on the DWR GIS external drive
Monitoring Stations (See Gauges)					
Pumping Plant					12_InlandWater 17_Structures
Reclamation Districts					03_Boundaries
River Miles					12_InlandWater
State Water Project					12_InlandWater 17_Structures
Structures Bypass Canals Dam					12_InlandWater 17_Structures
Topo Map USGS 24K ESRI Topo					03_Boundaries 17_Structures
Class C - Data for Analysis					
Census					16_Society
Fire Stations					17_Structures
Land Use					15_PlanningCadastre
Ortho Imagery NAIP 2009					10_ImageryBaseMapsEarthCover
Police Stations					16_Society
Public Land Survey					15_PlanningCadastre
Railroad					17_Structures
Schools					17_Structures
Threatened and Endangered Species					07_Environment
Vegetation					02_Biota
MISC - Tools					
Annotation Delta State					

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Dataset	IAP Map	Situation/Plans Map	Briefing Map	Transportation Map	ISO Index Where to find this data on the DWR GIS external drive
Cartography DWR_Symbology					
<p>Legend: R-Required layer for product O-Optional Layer - may be added if available</p> <p>*These datasets may be used for land manager planning, but may not be displayed on the final map as the sites are sensitive and not for public display.</p>					

Chapter 5 Map Symbolology

Purpose

The use of standard symbols in mapping flood incidents facilitates fast and consistent interpretations of mapping products. Standard map symbols are required to avoid ambiguous map interpretation, which can become a safety issue during an incident.

Symbols that are used by anyone who may create maps digitally or who may hand draw maps on an incident are addressed in this SOP to encourage safety, consistency, and readability.

Procedures

The United States Army Corps of Engineers proposed map symbols are the primary standards. This document presents standard map symbols to be used by the GIS Specialist on the ICT.

Accompanying text will be used to identify the symbols that look similar on a black and white map. The text is used not only as a designator of the symbol type (e.g., BH Borehole, B Incident Base). Care should be taken to place the identifying text close enough to the map symbol to avoid confusion with nearby symbology.

Caution is also advised in the use of a white halo border for symbols. A thin, white border around map symbols may facilitate visibility of the symbol. However, the Halo may obscure relevant data underneath.

Although the symbols are evaluated individually and thus technically stand on their own as standards, the standards symbology will be available during training, from the FOC GIS Specialist and on the external data drive distributed to the GIS Specialist.

This SOP is intended to be technology independent. Standard symbols sets for presently accepted GIS software packages (i.e., ArcGIS style set), along with instructions for loading the symbology, can be found on the ICT external drive. The symbols will also be available individually as graphics files to be incorporated into any GIS software that allows custom symbols.

Choice of symbols size is left to the discretion of the GIS Specialist and the ICT Director.

Specifications

The following acceptance criteria were used for symbol selection:

1. GIS symbols relate to features that are important to a flood incident..
2. Standard GIS symbols must relate to the standard map products under the SOP for Standard Map Products.

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3. Symbols must be easily and quickly identifiable when displayed in color and black and white.
4. Symbols must be clearly distinguishable between other ICS symbols when displayed in color and in black and white.
5. Symbols must be designed to allow field personnel to easily hand draw the symbols on hard copy maps.

Responsibilities

The GIS Specialist is responsible for using the standard GIS map symbology on an incident. However, the GIS Specialist has the cartographic license to adapt (e.g., enlarge, use halo) the symbology for map readability while maintaining the essential design of the standard symbols. Map symbol colors, if applicable, will be maintained.

Communications

The GIS Specialist should communicate with the Planning Chief regarding the use of standard mapping symbology on an incident. This is especially important when the GIS Specialist uses cartographic license to enhance map symbols.

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Chapter 6 Map Products

Purpose

The Standard map Products described in this chapter are used often during an Incident or Event. This Standard Operating Guidelines (SOP) provides guidelines for the creation of GIS map products during an incident. Optional map definitions have also been develop for other GIS maps that may be created during an incident.

The objective is not to create a standard for every possible project. These “standards” are intended to be used as guidelines. Flexibility will need to be applied to these standards, as ICT Commanders and Section Leaders may have specific needs or preferences.

General Procedures

Map produced on an incident should communicate the intended message clearly.

Responsibilities

The Plans and Intel Chief or the Situation Unit Leader (SITL) is responsible for ensuring that standard map symbology is used mapping flood incidents.

The GIS Specialist, in turn, is responsible for using the standard GIS map symbology on an incident. However, the GIS Specialist has the cartographic license to adapt (e.g., enlarge, use halo) the symbology for map readability while maintaining the essential design of the standard symbols. Map symbol colors, if applicable, will be maintained.

Communications

The GIS Specialist should communicate with the SITL regarding the use of standard mapping symbology on an incident. This is especially important when the GIS Specialist uses cartographic license to enhance map symbols.

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Product Name

STANDARD

Incident Action Plan Map

Product Description

The IAP Map is the primary map used by Incident Command Team in completion of their mission and is a supplement to the Incident Action Plan.

Target Personnel

Incident Command Team

Objective

The IAP Map effectively communicates geographic feature relations and incident management objectives on an incident. The IAP Map is a tool used by operations staff to display field assignment, crew instructions, and division safety concerns at the operational period briefings and breakout meetings. The IAP Map is a tool for flood fight.

Guidelines

- Standard DWR Symbology
- Color choices Black and white to enable clear duplication
- Letter (8 ½" X 11")
- Generally 1:24,000 or 1:63,360 (1 inch = 1 miles)
- Prepared for operational period briefings

Required Elements

Cartographic

- STANDD (Scale, Title, Author, North Arrow, Date of Data, Datum)
- Date and time produced (small font for reference)
- Incident name and number
- Symbol legend
- Operational period (day-night)

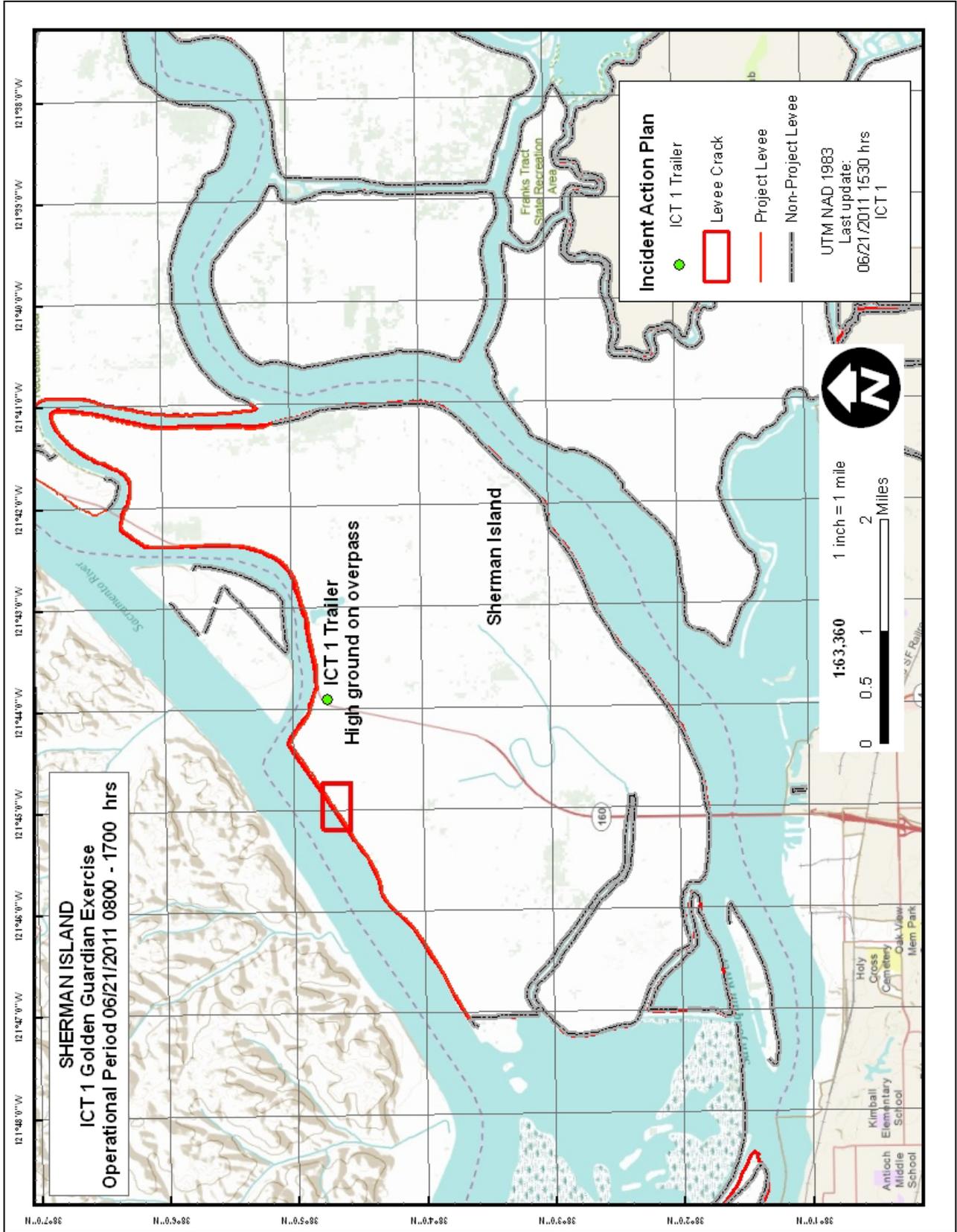
Data

- Incident Command Center (ICC), Incident Command Team (ICT) location
- Topography (USGS Topo, ESRI Topo)
- Imagery (optional if preferred above topography)
- Levee centerlines, stream gauges
- ICS features (ICT trailer, levee break)
- Geographic reference (usually latitude, longitude)
- Roads (unless already included on background Topo map)

Optional Elements

- Levee mile markers
- Administrative boundaries
- County boundaries

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Map Product Definitions --- Standards

Product Name

STANDARD Transportation Map

Product Description

The Transportation map is small, planimetric map showing the access routes to the incident.

Target Personnel

Operations, logistics, crews, ground support

Objective

The Transportation Map provides an overview of the transportation network in the incident vicinity to support safe transportation. This map is used to facilitate land-based delivery of equipment, supplies, and personnel to and from the incident location.

Guidelines

- Standard DWR Symbology
- Black and white to enable clear duplication
- Letter (8 ½" X 11")
- Generally 1:24,000 or 1:63,360 (1 inch = 1 miles)
- Prepared for operational period briefings

Required Elements

Cartographic

- STANDD (Scale, Title, Author, North Arrow, Date of Data, Datum)
- Date and time produced (small font for reference)
- Incident name
- Symbol legend

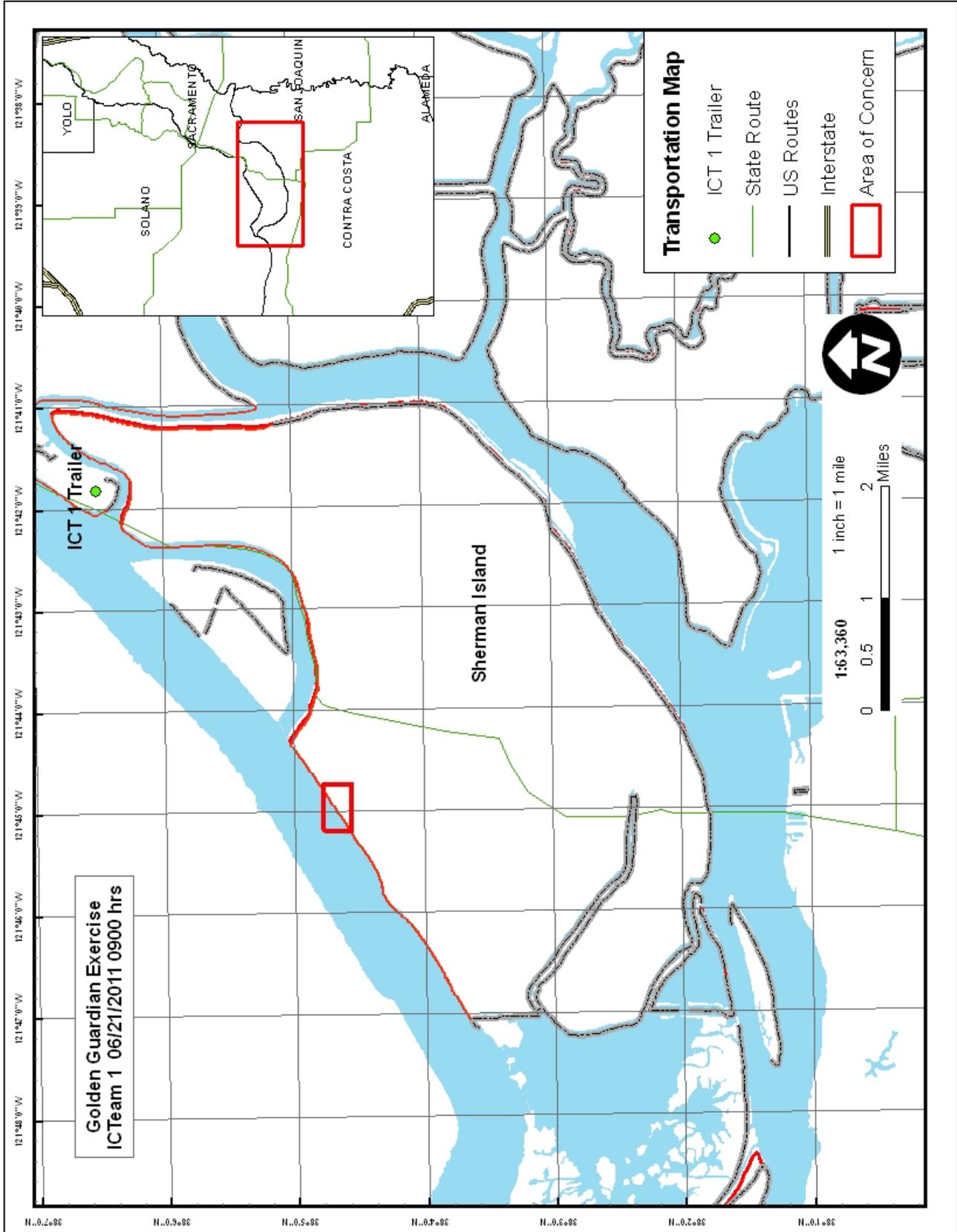
Data*

- Area of concern (example: Twitchell Island)
- Hydrography
- Major roads, local roads
- Route restrictions (example: dirt road on private land)
- ICS features (example: ICT trailer, levee break)
- Geographic reference (usually latitude, longitude)

Optional Elements

- Levee mile markers
- Stream gauges
- Administrative boundaries
- County boundaries

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Map Product Definitions --- Standards

Product Name

Incident Briefing Map

STANDARD

Product Description

The Incident Briefing Map is large-format map of the incident area, which is used during briefings to discuss work assignments, and other details for the upcoming operational period.

Target Personnel

Plans Section Chief, Incident Commander, Operations Section Chief, Safety Officer

Objective

The Incident Briefing Map communicates sufficient incident detail to enable operations staff to brief personnel assigned to the upcoming operational period.

Guidelines

- Standard DWR Symbology
- Simple fonts and symbols, large enough to be read from the back of the briefing room
- Reduce clutter to enable clear communication
- "E" size (34" x 44") or larger

Required Elements

Cartographic

- STANDD (Scale, Title, Author, North Arrow, Date of Data, Datum)
- Date and time produced (small font for reference)
- Incident name and number
- Symbol legend

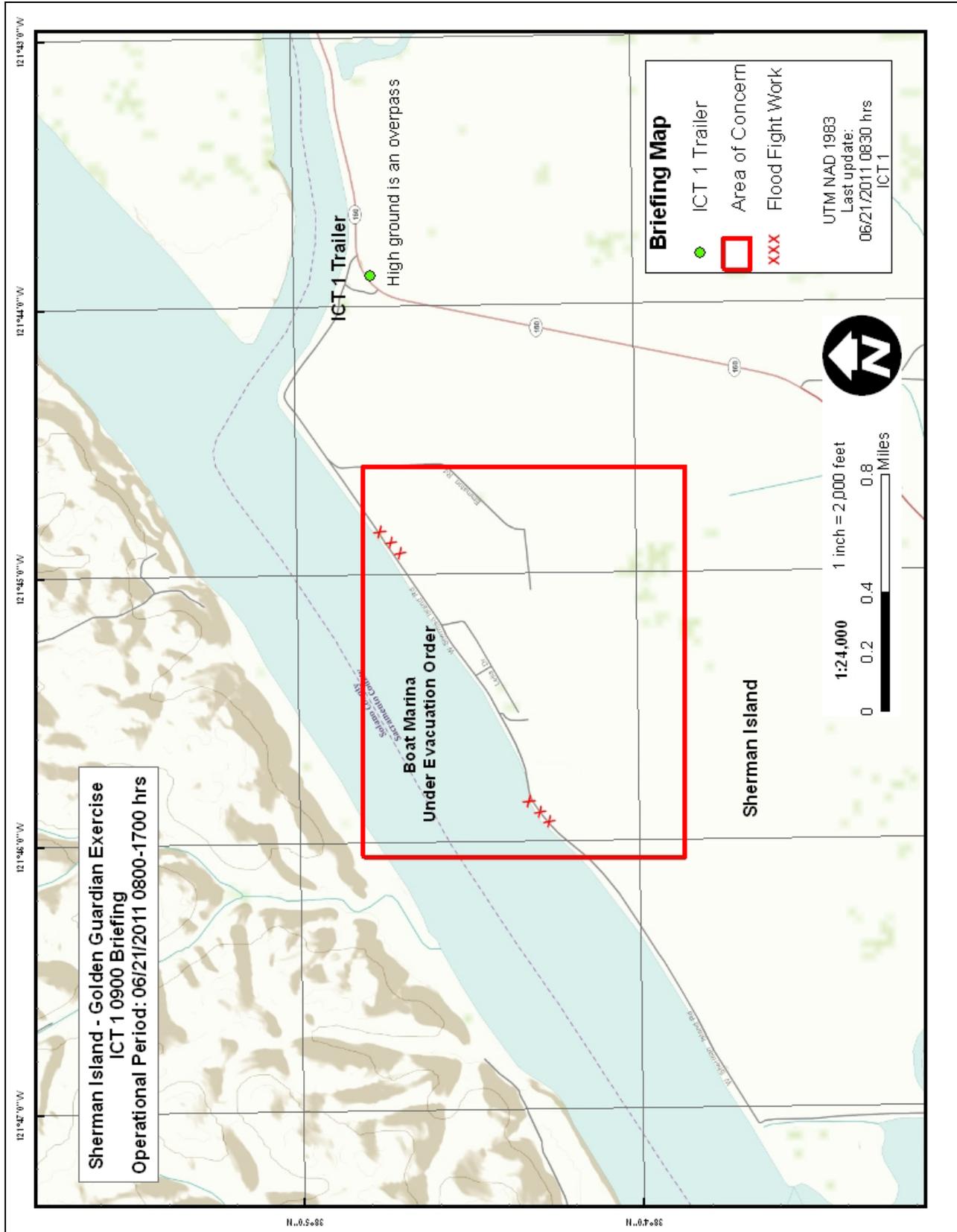
Data*

- Incident Command Center (ICC), Incident Command Team (ICT) location
- Topography (USGS Topo, ESRI Topo, or imagery)
- Levee centerlines, stream gauges
- Major Transportation routes to incident
- ICC features (levee break, trailer location, aviation features)

Optional Elements

- Safety Hazards
- Escape Routes
- Geographic reference (latitude, longitude, Public Land Survey)
- Administrative boundaries
- Stream gauges

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Chapter 7 Data Archiving and Sharing

Purpose

This chapter provides procedures for the archiving of data and the sharing of GIS data developed on an incident. The purpose of the archiving data is to capture incident data for safekeeping of the record. Data archiving allows the GIS Specialist to recover a recent status of the incident data in case of computer failure or data corruption. Data sharing guidelines ensure that the transition between incoming and outgoing teams is effective, minimizing confusion and reducing redundancy. Data Sharing also includes making the data available to other users of the data.

Specifications

Incident data and incident base data layers that have been edited for the incident must be archived. Export all incident vector data layers to shapefiles before archiving. This allows for compatibility of data among software vendors.

The primary datasets that need to be shared on a daily basis are the incident status data layers. Post these data on the designated DWR FTP site. Check with the FOC for the address and instructions.

Procedures

Data Archiving: GIS data are in a digital format that requires constant maintenance. Part of this maintenance involves the backing up and archiving of the data. For the purpose of the SOP, “archiving” is used to define the process of copying data from the operational format to another format for safety and record keeping purposes. Refer to the definition, below, for complete information.

The main features of archive policy are:

- The archived copy may be kept indefinitely or for a defined period of time; the archive retention period is usually set at 3 to 5 years and can be renewable.
- Multiple versions of the same files may be archived; however, this is not recommended unless the contents of files are different and required.
- Archived data should also include the datasets in their original format.

Data sharing: At the end of each operational period, the incident data are updated and uploaded to <ftp.water.ca.gov> or wherever the FOC directs you to upload for documentation. FTP directions are provided in Appendix ???.

File names must adhere to protocols established in Chapter 2. At the beginning of each flood season the DWR Flood Operations Center will issue the current upload sites and acceptable file formats.

Guidelines

(Refer to Chapter 2 for File Naming and Directory Structure.)

- ❖ Export incident data to shapefiles before any archive task; also archive the geodatabase

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- ❖ At the end of each operational period, archive the incident_data, Incident_products, and incident_projects directories to a different location than the operational computer.
- ❖ Only dynamic datasets need to be archived. All base data should also be stored on media separate from operations systems.

-Data should be archived in formats that allow for quick recovery.

- ❖ Make an entry in the GIS Specialist log for each archive
- ❖ Hourly or simple backups can occur for datasets as they change.
- ❖ Provide a copy of the GIS Incident data archive to Flood Operations Center GIS Analyst for safekeeping.

Responsibilities

The GIS Specialist is responsible for checking with GIS representatives of local agencies regarding preferred data format, ensuring proper transition and ease of use of data.

Communications

When asked for access for information (data, maps, etc.) the GIS Specialist is responsible for communicating these requests to the ICT Plans and Intelligence Chief to get the proper authorization to release the data to the requesting party. Handling of sensitive data is subject to restrictions.

Definitions

Archive – Archive is the long-term storage of data that are considered to be of value to the incident. It is held, independent of the continued existence of the file on your local drive. Archived files may be removed from the local disk on your computer, if required (for example, for space reasons).

Backup – Backup is intended to provide a mechanism for securing your **current, active** files; that is, files and data that are resident on your local disk and by implication actively in use. It enables you to recover your disk to its most recent state in the event that it is lost (for example, hardware failure): it is also enables you to recover a file or files that have been lost (for example, accidentally deleted).

Data sharing – the process of distributing to other interested parties or agencies during the course of an incident or event. At the end of the incident/event, data are transitioned (Chapter 8).

Incident Data – Data that are created or edited in support of the incident.

Base Data – Existing data that are used to provide the base features for mapping (e.g., Roads, Land, Ownership, etc.). These data are not edited during the incident.

Modified Base Data – Base Data that have been edited in support of the Incident, but are not ICS data.

Chapter 8 Team Transition

Purpose

This chapter provides the GIS Specialist with an effective and consistent method of transitioning from one GIS Specialist to another. Providing the methods of work and direction ensures that all data, products, and other related information are transferred successfully.

Specifications

Transition of the GIS responsibilities refers to any hardware purchased for the Incident's GIS Specialist plus all relevant GIS data and media. It is important that all data are transferred and remain in their current directory (Chapter 2).

Procedures

It is always important for the GIS Specialist to remain focused and follow procedures during this transition period.

The first procedure that must be addressed is transferring data from one storage device to another. It is critical to preserve the directory structure, drive letter mapping, or to follow Universal Naming Conventions (UNC) from one GIS Specialist to the next.

GIS Specialists use a variety of media when operating on an incident. Storage devices range from basic shared drives on computers utilizing workgroups and shared portable hard drives to advanced computer networks utilizing switches, hubs, DJUCP and Snap Servers. Several transition methods can be used (Peer to Peer, DVD, external hard drives).

General Guidelines

- Before saving all final products, turn off all software extensions so that the final GIS documents can be opened with the basic installation of the relevant GIS Commercial Off-the-Shelf Software.
- Before data transfer begins, archive all incident data to portable media (CD or DVD).
- Document any unique characteristic of the data, along with the software (including version) and any tools being used
- Check for any sensitive information and what guidelines need to be satisfied for it to be transitioned to the next team. (This could include the need to reformat hard drives or any other media that will be leaving the incident.)

Documentation useful at transition includes

- An image, hardcopy, and a list of each map type that has been produced on the incident, as an example of products produced.
- A short narrative describing the status of equipment, workload, work schedule, and other activities.
- A list of resources being used for mapping and data collection (ICT, Engineers, CCC)
- If a GIS Specialist remains on the incident, the specialist should work with the ICT Commander to describe the skill sets of the individual GIS Specialists to better utilize them with the incoming team and advice of their schedules and availability.

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- If the ICT Commander authorizes use of nonstandard symbols on an incident, the GIS specialist should include necessary documentation in the transition package to incoming GIS Specialist
- The outgoing GIS Specialist will provide map symbology information to the incoming GIS Specialists or the ICT Commander during the transition briefings. This facilitates consistency in the use of map symbols on an incident.

To ensure transition is complete, use the following checklist

- Are there enough GIS Specialist and is workload appropriate?
- Are the incoming GIS Specialists able to reproduce products produced by the exiting GIS Specialists?
- Are the needs of the local unit and other entities being met?
- Have the new GIS Specialists established communication with the local unit to share data (e.g., local county ICC)

Responsibilities

It is the responsibility of the outgoing GIS Specialist to:

- Ensure that the incoming GIS Specialist have a clean, usable, and documented copy of the incident data.
- Communicate the requirements for storing, sharing, and displaying sensitive data.

It is the responsibility of the outgoing GIS Specialist and SITL to:

- Ensure that the GIS staffing and equipment requirements are planned for and will be met during the transition

It is the responsibility of the outgoing GIS Specialist to:

- Test and verify that all data have been transferred successfully and are fully usable (access, read, and edit).

Communications

All requests for maps should go through the Plans and Intel Chief.

The Computer Specialists of the outgoing and incoming teams should be aware of the network, hardware, and software requirements of the GIS Specialists.

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Acronyms

Common Emergency Management Acronyms

CERT Community Emergency Response Team

CEM Comprehensive Emergency Management,

also Certified Emergency Manager

EAP Emergency Action Plan

EHS Extremely Hazardous Substance

EMA Emergency Management Agency

EMF Emergency Management Functions

EMS Emergency Medical Services

EOC Emergency Operations Center

EOP Emergency Operations Plan

ERP Emergency Response Plan

ERT Emergency Response Teams

ESF Emergency Support Function

FIRM Flood Insurance Rate Maps

FEMA Federal Emergency Management Agency

FIRESCOPE Fire fighting REsources of Southern California Organized for Potential Emergencies

FOC Flood Operations Center

FY Fiscal Year

GIS Geographical Information System

HAZUS HAZards US

HAZUS-MH HAZards US-MultiHazard

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IC Incident Commander

ICS Incident Command System

IDLH Immediately Dangerous to Life or Health

IMS Incident Management System

JIC Joint Information Center

LIDAR Light Detection And Ranging

NIMS National Incident Management System

NOAA National Oceanographic and Atmospheric Administration

NWS National Weather Service

OSHA Occupational Safety and Health Administration

SOGs Standard Operating Guidelines

PIO Public Information Officer

USAR Urban Search and Rescue

USGS U.S. Geological Survey

VZ Vulnerable Zone

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DWR FLOOD FIGHTING METHODS July 2009

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DWR INCIDENT COMMAND SYSTEM Field Operations Guide 420-1 Revision 2005

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DWR INCIDENT COMMAND SYSTEM Field Operations Guide 420-1P Revision 2005

State of California Department of Water Resources Division of Flood Management

Flood Emergency Operations Manual, February 2002

State-Federal Operations Center, Department of Water Resources

GIS Standard Operating Guidelines on Incidents, June 2006

National Wildfire Coordinating Group, PMS 936, NFES 2809

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APPENDIX A: List of Necessities for Responding to an Incident

___ Establish where and when to report

Personal

___ Boots, rain gear, hat (your own or check with your Plans/Intel Chief)

___ Change of clothes (wool socks, pants, and shirt)

___ Hygiene (toothbrush, soap)

Professional

___ Work with the Plans and Intel Chief to make sure you have a: Computer, thumb drive, VPN token for the incident

___ FOC DSS: External GIS Datasets: DWR_GIS_SOP

___ FOC DSS: GIS Toolbox (preprinted map books, DWR GIS SOP)

___ General Office Supplies Box: pens, pencils, printer paper

Survival

___ Food and water i.e., power bars, water bottle

___ Four wheel drive or all wheel drive vehicle

___ Sleeping bag, pillow

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