



INCIDENT COMMAND SYSTEM PUBLICATION

GEOGRAPHIC INFORMATION SYSTEM SPECIALIST
OPERATIONAL SYSTEM DESCRIPTION
ICS 166

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This Document contains information relative to the Incident Command System (ICS) component of the National Incident Management System (NIMS). This is the same Incident Command System developed by FIRESCOPE. Additional information and documentation can be obtained from the following source:

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INTRODUCTION

FIRESCOPE's Geographic Information System Specialist (GISS) Operational System Description (OSD) is closely aligned with and will continue to coordinate in the development of the [NWCG Incident Position Description \(IPD\) \(2022\)](#). The NWCG IPD has been adopted and restated below, with the addition of California-specific, all-hazard recommendations (notated in italics).

The GISS is responsible for providing timely and accurate spatial information about the incident to be used by all facets of the Incident Management Team (IMT) and the national coordination system. The responsibility also includes the collection, management and archiving of all geographic information system (GIS) data collected at the incident.

Within the Planning Section of the Incident Command System (ICS), there is a well-defined process for the collection, management and dissemination of incident information. The Planning Section is responsible for maintaining the incident situation and producing incident maps. Through various methods, including deploying Field Observers (FOBS), using remote sensing technologies (such as infrared aerial flights) and frequently debriefing with the Operations Section's resources, the Situation Unit collects and manages relevant incident data to maintain the incident situation. The information is validated and approved for release both internally and externally by the Incident Commander. The GISS develops incident map products from the validated information and maintains the authoritative incident GIS database. Maps are printed and reviewed for accuracy and then mass-produced and distributed to incident resources at the beginning of each operational period. This cycle of collecting, verifying and distributing incident information and maps is constantly in motion until the incident operations cease.

The GISS will operate according to the [NWCG Standards for Geospatial Operations, PMS 936](#), and should review the publication annually. These GISS Position Standards will also apply to all-hazard incidents.

FIRESCOPE recommends close collaboration with our federal and state partners on all-hazard incident schema and workflow development similar to the National Incident Feature Service (NIFS) framework. This close collaboration ensures an authoritative source of interoperability during incidents.

Sections of the following are adopted from [NWCG IPD, 2022](#) with all-hazard additions notated in *italics*

Prepare and Mobilize

- Ensure individual readiness.
- Read and demonstrate understanding of the [NWCG Standards for Geospatial Operations](#) (PMS 936, the "GeoOps"), and [NWCG GISS Workflow](#) (PMS 936-1, GeoOps Workflow)
- *Create and maintain necessary map and document templates pre-deployment.*
- *Clearly identify and communicate data-collection processes and SOP's to incident personnel.*
- Gather critical information pertinent to the assignment.
- Travel to and check in at assignment.
- Check in with incident supervisor and/or dispatch when arriving at the incident.
- Review Incident Action Plan (IAP) and obtain briefing, objectives, and intent from supervisor.
- Obtain briefing from previous shift/assignment position as necessary and establish workspace.
- *Establish 24-hour Planning Section and GIS Support with Subject Matter Experts (SME's).*
- *Ensure adequate (in number and permission-level) software credentials are available for incident personnel.*
- *Establish processes for efficient data collection and dissemination.*
- *Identify a sustainable source of hardware devices, (computers, tablets, printers, plotters) along with respective troubleshooting and maintenance support.*

Perform Geographical Information System Specialist Specific Duties

- Data Preparation:
 - Gather Incident Information data elements required to populate by the [NWCG Wildland Fire Event Point](#), [Wildland Fire Event Line](#), and [Wildland Fire Event Polygon](#) Geospatial Data Layer Standards
 - *All-hazard incident data will be collected and disseminated through similar national authoritative feature services and datasets.*
 - Create the [PMS 936](#) incident directory structure.
 - Prepare a copy/copies of the NWCG Event Geodatabase (GDB) for data editing and incident map creation following the most current [NWCG GISS Workflow, PMS 936-1](#).
 - Follow [PMS 936](#) naming conventions when creating or modifying incident folders and data.
- Edit Incident Data:
 - Secure information and data under the supervision of the Situation Unit Leader ([SITL](#)) to create/edit the incident dataset.
 - Work with a variety of spatial data types (raster and vector) from multiple sources and in a variety of formats, such as services, GDBs, and shape files.
 - Process, convert, import incoming data; follow naming conventions; and store per PMS 936 incident directory structure.

- Edit the GDB (Local Copy or Edit Incident GDB) using ArcGIS Pro.
- Populate all required elements in the NWCG Event GDB *or National Alliance for Public Safety GIS (NAPSG) GDB*.
- Export latest fire perimeter to the progression GDB.
- Perform analysis and calculate necessary attributes such as fire acres, point latitude/longitude, US National Grid coordinates, ownership acres, line length, and percent containment.
- *Share real-time all-hazard datasets and products with cooperators.*
- *Utilize appropriate all-hazard, authoritative symbology from PMS 936 and NAPSG for US&R incidents.*
- *Adhere to (5) established US&R planning elements for Wide Area Searches (WAS) in order to support the management and organization of an effective search effort.*
 - 1) *Search Criteria*
 - 2) *Land Navigation*
 - 3) *Data/ Intel Collection*
 - 4) *Vetting of Intelligence*
 - 5) *Efficient dissemination of information and intelligence*
- Update Master Incident GDB:
 - Use ArcGIS Pro to synchronize incident data with the National Incident Feature Service (NIFS).
 - Backup incident GDBs per [PMS 936](#).
 - Replace Master Incident GDB.
- Create Incident Maps and Digital Products:
 - Use ArcGIS Pro tools and templates to create incident maps using the Master Incident GDB.
 - Ensure that all essential cartographic map elements are present and correct per [PMS 936](#).
 - Produce map products following [PMS 936](#) map product standards and *all-hazard* incident symbology standards.
 - Export geospatial PDF maps per [PMS 936](#).
 - Create products meeting the SITL's timelines and priorities.
 - Backup map documents and PDF maps per [PMS 936](#).
- Backup and Sharing:
 - Post map products to National Interagency Fire Center (NIFC) FTP site.
 - Backup incident directory structure.
 - Download and backup any external incident data sources, custom hosted feature services, and data collection forms nightly and place in an appropriate location in the incident folder structure.
 - Complete required documentation.
- *Online Products*
 - *Create web maps and/or web apps that contain the Mobile Edit Feature Service, Repair Status Feature Service, and/or Structure Triage GISS Edit Service, to allow field personnel to edit or collect data in the field. This data can be set up to be used offline and allows for live syncing (with an internet connection) to view incoming edits.*

- *Dashboards can be developed as an additional online product used to show live statistics about the incident.*
 - *This can be displayed either internally only to the Incident Command Staff (AGOL NIFC login required) or publicly. If sharing to the public there are steps required to make sure data cannot be downloaded/edited/etc.*
- Transition:
 - Effectively transfer incident data, projects, and products to incoming team/local unit *through a transition plan document.*
 - *Important aspects to note are; queries used, special maps specific to the incident, or any products or processes that are non-standard on a typical incident.*
 - Transfer all non-NIFS data embedded in web maps and web applications to the incoming team/local unit, along with copies of data present in any web map or application.
- Advanced Duties:
 - Manage incident data in the NIFC/NAPSG ArcGIS Online Organization using web maps and apps.
 - Work with ArcGIS Online and manage mobile devices using ArcGIS *Field Maps* (iOS & Android).
 - Work with ArcGIS Field Maps and national surveys (e.g., structure triage, accountable property, NAPSG).
 - *Utilize ArcGIS QuickCapture for Search & Rescue (SAR) personnel track logs*
 - Make incident maps available for, and assist incident personnel in using, the Avenza Maps Pro application (iOS & Android).
 - Troubleshoot hardware and software problems sufficient to stay operational. (e.g., basic software installs, license management, printer drivers, and plotter connection).

Communicate and Coordinate

- Communicate and exchange technical information with personnel inside and outside the Situation Unit, following established processes and chain of command for collecting, producing, and distributing information. Inform others of product contents and application, and *intent*.
- Answer incident situation questions such as number of acres burned, acres by ownership, or other questions requiring basic GIS analysis and geoprocessing.
- Explain technical issues or concerns to Lead GISS, SITL or Incident Technology Support Specialist (ITSS).
- *If possible, communicate with the Infrared Interpreter ([IRIN](#)) to coordinate when IR information will be posted to the NIFS. Timely acquisition of infrared (IR) data (when available) can help GIS section coordination and allow for more efficient product creation.*

- Communicate field data collection procedures to Field Observers (FOBS), Resource Advisors (READs), *Sheriff Search & Rescue (SAR)*, *US&R Task Forces* and other incident staff.
- Ensure clear understanding of expectations and timely communication within and across Incident Command System (ICS) functional areas and chain of command.
- Demonstrate skills that establish and maintain a positive team climate.
- Demonstrate critical thinking and decision-making skills by contributing to team tasks.
- Participate in After Action Reviews (AAR) as requested.
- Maintain awareness of the changing responsibilities and expectations throughout the assignment. Communicate when expectations exceed capacity, and work with SITL to adjust expectations or augment resources.
- Communicate to SITL when map and task requests are made outside the ICS chain of command.
- Perform assigned GISS duties within the constraints of typical incident conditions.

Document

- Complete, authorize, ensure timeliness of, and route as required:
 - General Message, [ICS 213](#).
 - Map request documents.
 - Documentation package maps.
 - Crew Time Report (CTR), SF-261, FC33, OES F42, or applicable agency payroll documents

Demobilize

- Anticipate demobilization, identify excess resources, prepare demobilization schedule, and communicate with supervisor.
- Return equipment and supplies to appropriate unit.
- Ensure incident and agency demobilization procedures are followed.
- Complete demobilization checkout process before being released from the incident.
- Upon demobilization, report status to home unit including reassignment or estimated time of arrival (ETA) to home unit.
- Ensure incident and agency work/rest driving standards are followed.

EXTERNAL LINKS

National Wildfire Coordinating Group (NWCG) GISS Workflow, PMS 936-1
<https://www.nwcg.gov/publications/pms936-1>

National Incident Feature Service (NIFS)
<https://www.nwcg.gov/publications/pms936/nifs>