Practical Uses for USNG Maps in Public Safety

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Location-Enabled Decision Support

Preparedness, Planning, Decision Support, and Operations
Preparedness, Disaster Operations, Decision Support

- Preparedness
  - Threat Hazard Risk Identification Assessment (THIRA)
  - Catastrophic Planning
  - Mission-based Required Resource(s) Planning
  - Pre-Scripted Mission Planning
  - Revisions to Emergency Operations Plans and Standard Operating Procedures

- Incident Support & Coordination | Command & Control
  - Situational Awareness
  - Decision Support
  - Pre-scripted Mission Deployment/Employment
  - Organizing, managing, and tracking operations
Location-enabled decision support that uses a common location language for planning, reporting and navigation, can be used for designating ground-based areas of interest or operations by defining levels of operation at strategic, regional and tactical levels.

- Strategic – 100,000m
- Regional – 10,000m (~62 miles)
- Tactical – ≤1,000m (≤.62 miles)

Using scalable features or boundaries such as a MGRS/USNG grid to assess potential effects of an incident and associated resource requirements allows for consistent and rigorous decision support across perspectives.
Features and Benefits

• US National grid (USNG) is both a **point** and **AREA** grid reference system

• Flexible precision (100K, 10K, 1K, 100m)

• Functionally equivalent to the MGRS which is in use by all branches of the military

• Allows for a **universal location language**

• Established as NATIONAL **standard** in 2001 (FGDC)
Decision Support and Mission Planning (example)

- Identify potential effects of an incident and associated missions within an area of interest or operations (scenario or real-world)
  - Affected populations and demographics including vulnerabilities and special needs
  - Built environment including infrastructure
  - Indirect and cascading consequences

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<th>H+24</th>
<th>Casualties</th>
<th>Adults</th>
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<td>1,345</td>
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<td>13,530</td>
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<tr>
<td>Missing</td>
<td>338,244</td>
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Decision Support and Mission Planning (Planning/Operations)

- Establish resource requirements, capabilities, and capacity to manage or support incident
  - Multi-disciplinary mission(s) planning based on real-world pre-incident forecasts
    - Revise based on incident specific intelligence and damage assessments
    - Establish trigger points for declaring alerting/requesting mutual aid and/or local state(s) of emergency
  - Scenario or incident specific location-enabled analysis supports requests for emergency declarations
Mission Analysis

• Goal:
  Data-driven analysis of mission based required capabilities, resources, and capacity

• Using basic data layers, including USNG/MGRS grid overlay
  • Incident data/forecasts
    (potential extreme weather forecasts, projected flooding, hurricane track, tornado path, tsunami inundation, etc)
  • Demographics (age, vulnerabilities, transportation, language)
  • Community lifelines (transportation, communications, energy)
  • Critical Facilities
    (police, fire, medical/pharmacy, schools, banks)
• 67 counties declared for public assistance
  - Debris Removal & Emergency Protective Measures
• 43 counties declared for individual assistance
  - Assistance to individuals, families, & businesses with damages/losses not covered by insurance
• 33 counties declared for permanent work aid
  - Repairing roads/bridges, water control facilities, buildings & equipment, utilities, parks, recreational facilities, and other facilities
Using commercial satellite imagery, National Geospatial Intelligence Agency (NGA) performed initial analysis of tornado swaths.

Initial sweep identified 289 grids with likely extensive or catastrophic damage.

Counties requested additional areas for consideration and provided address and/or GPS coordinates.

Final grid count after collaborative efforts: 960.

Local cost share became 90% / 10%.

Vs. usual 75% Federal & 25% Local cost share.
• Using basic data layers, including USNG/MGRS grid overlay
  • Refined and focused situational awareness for terrain, demographics, critical facilities
  • Tactically vs Regionally (entirety of Miami-Dade County)
Many states have completed digital cadastral maps

- Typically accessible through local property appraiser
- Data sets can be used to determine a range of essential elements of information
Visualizing Potential Effects: Flood/Inundation Analysis

- Using location-enabled decision support tools like GIS provide context and supports
  - Mission planning
  - Identifying appropriate resources
  - Remote damage assessment
• Location-enabled analysis combined with the USNG as an area reference allow for informed planning across disciplines

• Use of an area reference system allows for operational coordination and promotes applying the right resources to the right place
Critical Facilities

• Establish shared situational awareness with local, regional, and national mutual aid partners across a range of public safety communities

• Enhance table data with location and maps to visualize resources or challenges across community lifelines
• Any number of data layers combined with geography (jurisdiction) and an area reference system, such as the USNG, can promote realistic situational awareness critical to unified operations.
Visualizing Data to Drive Action

- Relevant data in visual context transforms information into ACTIONABLE information
Situational Awareness: Monitoring Progress

- 17R NJ 8090
- Each grid square has 100 squares (10 X 10)
- Progress of any mission reported by grid gives general reference to % completed
  - # of grids reported complete = % complete

Primary SAR is 42 % Complete
Situational Awareness: Monitoring Progress

- Debris – Removal (Green)
  - 17R NJ 870 862; 871 862; 872 862; 873 862
  - 17R NJ 874 862; 875 862
  - 17R NJ 875 860 thru 875 870
- Debris – Clearance (Yellow)
  - 17R NJ 874 864 thru 874 866
  - 17R NJ 873 864 thru 873 866
  - 17R NJ 872 864 thru 872 866
  - 17R NJ 871 864 thru 871 866
Situational Awareness: Debris Operations

- 16% (Removed) - Green
- 16% (Cleared) - Yellow
- 68% (Remaining) - Red
Decision Support and Mission Planning (Preparedness/Exercises)

- Integration of location-enabled decision support facilitates an array of pre-incident and incident specific decision making
- Scenario-driven or historic event consequence analysis and estimated required resources/capacity along with decision support criteria can be routinely integrated into exercises
  - Allows for exercising decision support and decision triggers, rather than just operations
  - Location-enabled pre-incident and incident specific decision support fosters consistent methods for anticipating requirements, coordinating support to affected areas, and pre-arrival planning by command elements for staged or deployed resources
Scalable to Tactical Needs

- Coordinates below 100k meter are represented in pairs
  - Eastings & Northings RIGHT then UP
  - Number of digits determine precision

  **16R GU 61 07 – 4 digits = 1,000m** *(tactical AOR - .62 miles)*

- 16R GU 610 704 – 6 digits = 100m *(football field)*
- 16R GU 6103 7043 – 8 digits = 10m *(modest sized home)*
- 16R GU 61031 70436 – 10 digits = 1m *(parking space)*
Thank You!

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NAPSG Resources: http://www.napsgfoundation.org/all-resources/