

USNG in Florida

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United States National Grid

- **Lessons learned have taught us that standardized grids are needed for positional reporting.**
- **As far back as Hurricane Andrew, problems were recognized for emergency managers...**

What's wrong with current systems?

■ We already have...

- Latitude/Longitude
- Township/Range/Section
- Street Address and Zip
- UTM

Latitude/Longitude

- Multiple formats are confusing

DD -85.990151, 30.272240

DM -85 59.409089, 30.16.334386

DMS 85 59'24.545"W, 30 16'20.063"N

All the same location!!!

How far is a second anyway?

- What is the distance from....

85 59'24.545"W, 30 16'20.063"N

- To here....

85 59'26.292"W, 30 16'14.546"N

Worse yet...

- What is the distance from

-85.990443, 30.275358

- To here....

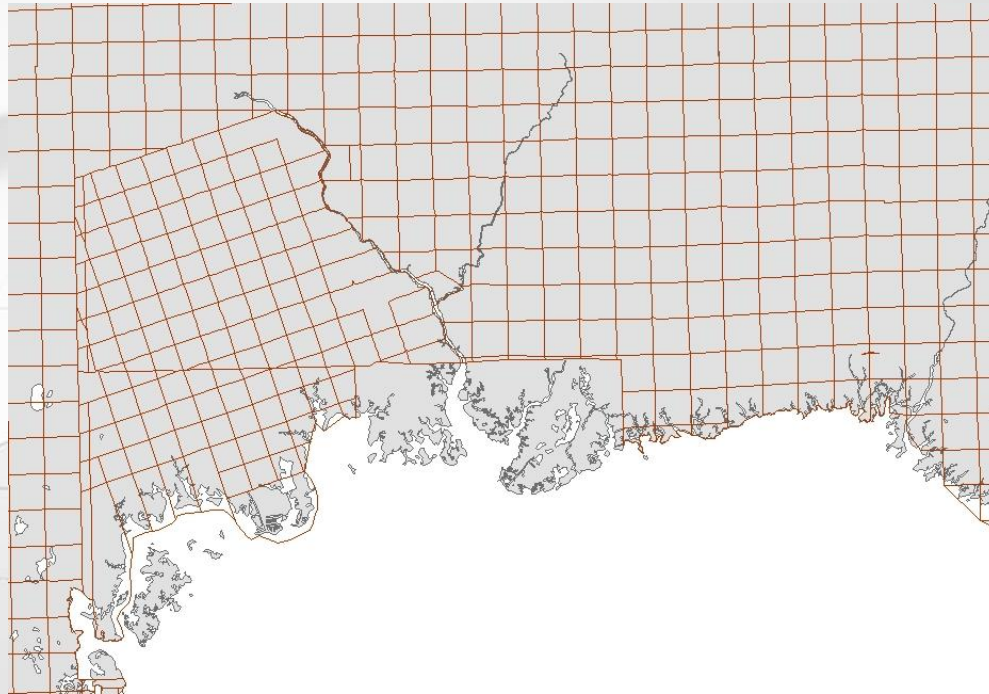
85 59.364547, 30 16.504539

Township/Range/Section

- Township/Range/Section grid from the Public Lands Survey System is an important and good system...
 - basis of land ownership records
 - been in use for over 180 years

Township/Range/Section

- But a perfect section really doesn't exist



- irregular in coastal areas
- too large to meet needs of ground crews

Street Address and Zip

■ Problematic due to...

- rural routes
- post office boxes

■ What do you do when the SIGNS are gone?



- **What do you do when the
ROADS are gone?**



Universal Transverse Mercator

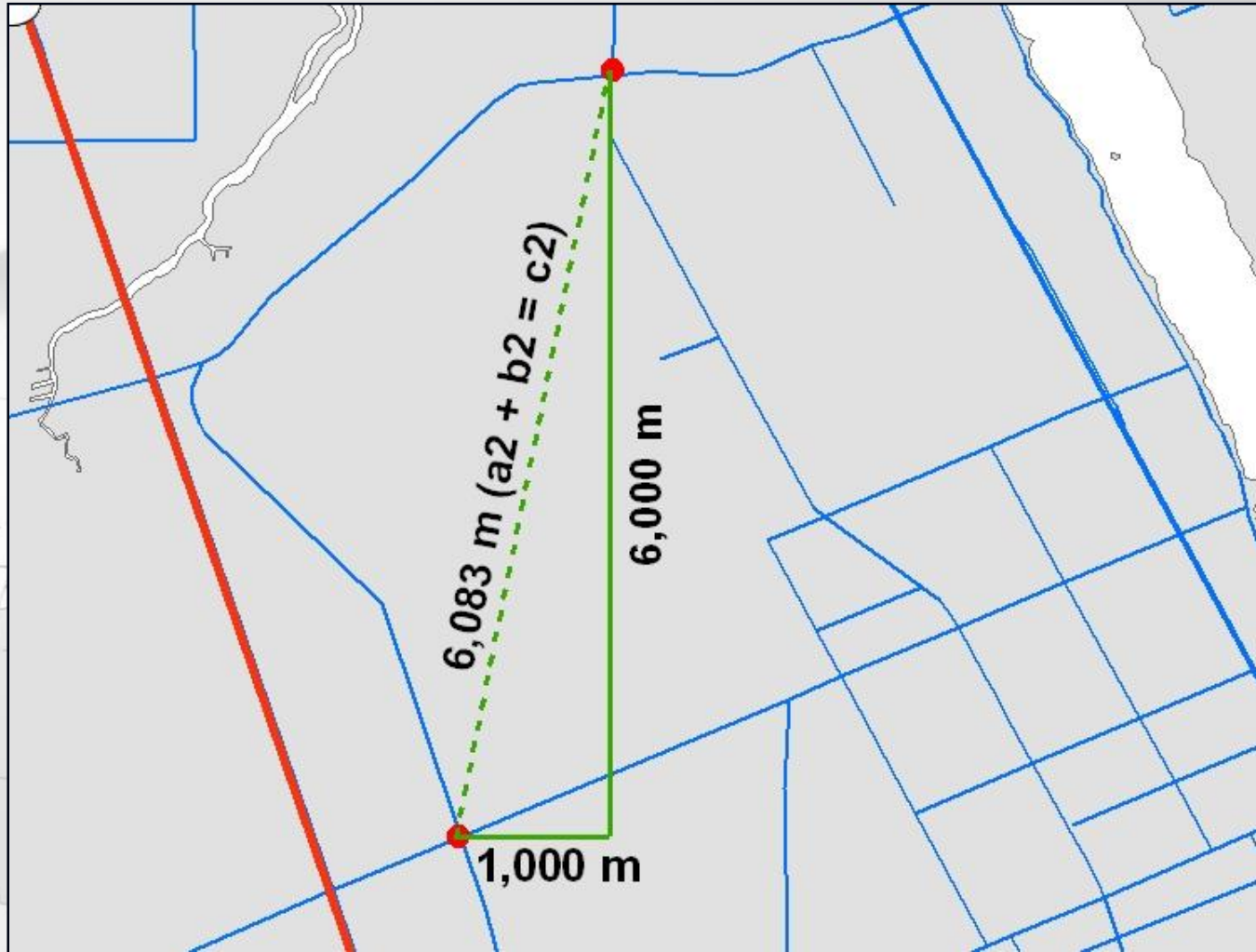
- Measuring distances and obtaining positional accuracy has always been a challenge.
- Following World War II, several European allies demonstrated the utility of grid-based conformal maps.

Abbreviated as “UTM”

UTM

- Calculating the distance between two points on these maps could be performed more easily in the field using the Pythagorean theorem instead of using trigonometric formulas required under the Latitude and Longitude system.

UTM



UTM

- Developed by the United States Army in 1947
- A position is reported by the UTM longitude zone, the distance from the central meridian (called the easting) and the distance from the equator (called the northing)

16R 766000 3364820

Military Grid Reference System

- Based on UTM
- Newer standard used by United States Armed Forces and NATO

Abbreviated as “MGRS”

MGRS

- Uses a 2 to 10 character geocode
 - 2 digits implies precision of 10 km
 - 10 digits implies precision of 1 m
 - 100,000 m grids truncated and replaced with alpha-numeric grid

16R GU 66000 64820

United States National Grid

- Essentially the same as Military Grid Reference System...
- So same format...

16R GU 66000 64820

Abbreviated as “USNG”

How to read USNG

16R GU 66000 64820

Grid Zone Designation – for a world-wide unique address, identifies the longitude zone number and the latitude band letter

100,000 Meter Grid – identification for regional areas

Grid Coordinates – Easting and Northing position



Truncate for less accuracy...

16R GU 66000 64820

66000 64820 Locates within 1 meter

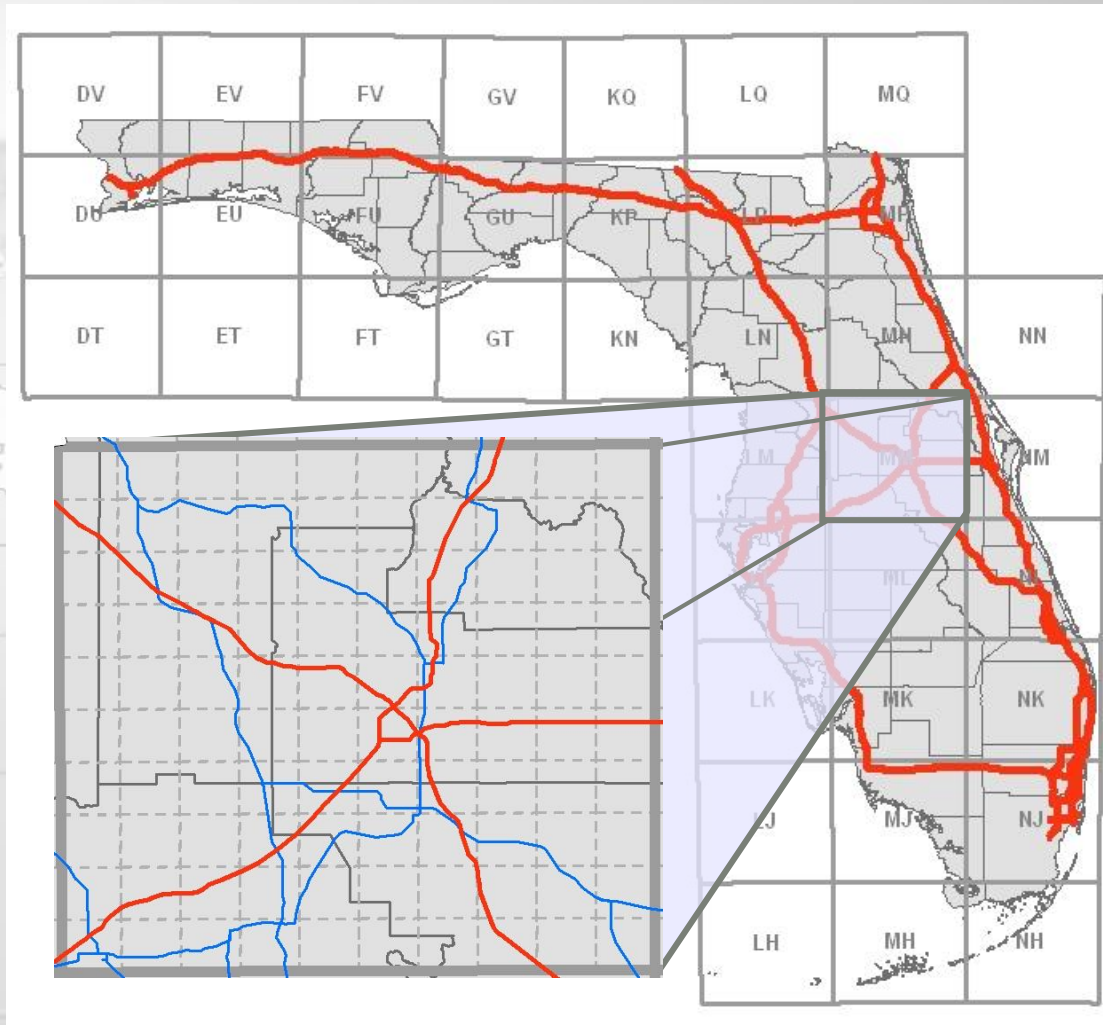
6600 6482 Locates within 10 meters

660 648 Locates within 100 meters

66 64 Locates within 1000 meters

USNG

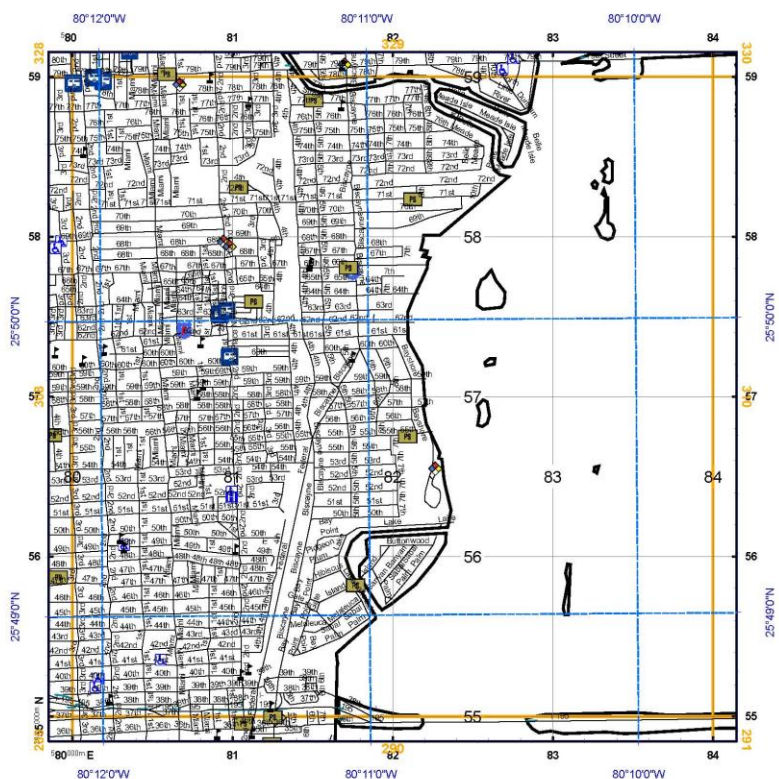
- Easily scaleable
- Pin-point and cell based locational reporting
- “Grid within a Grid”



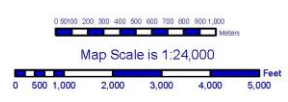
Global Positioning Systems

- I have GPS...why do I need to care about any of this?
 - USNG can be used with GPS
 - GPS supplements USNG
 - However, USNG can also work when GPS won't

USNG Sample Maps

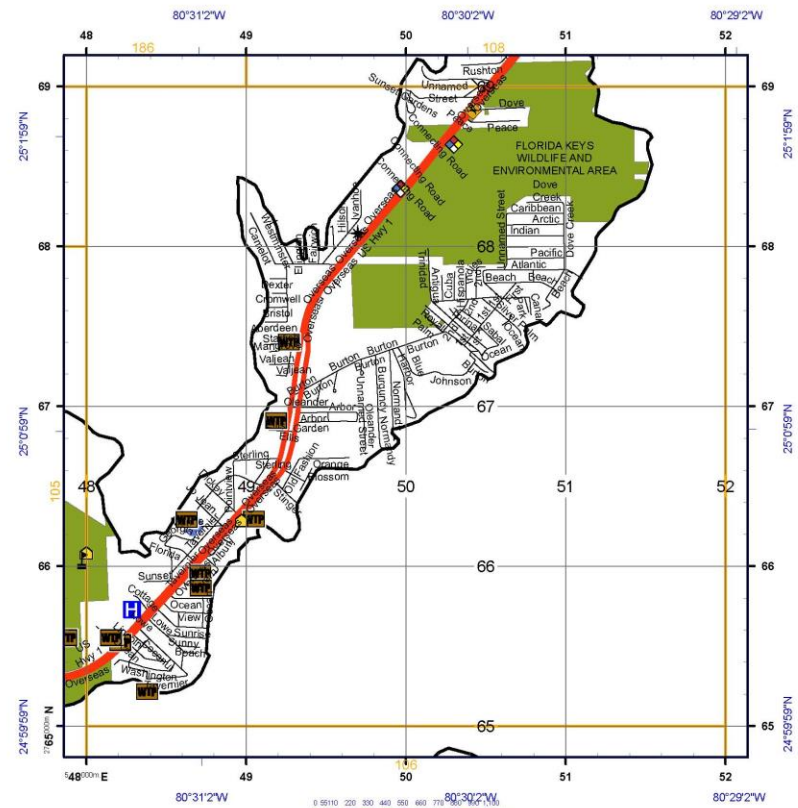


US Nat'l Grid
Zone = 17R
100,000-m Square ID
NJ



NOTE: If printing from pdf, please remove margins in the page setup and do not use "Print to Fit" as those options alter the map scale

Orange numbers indicate adjacent map pages



US Nat'l Grid
Zone = 17N
100,000-m Square ID
NH



NOTE: If printing from pdf, please remove the margins in page setup or else scale will be incorrect
Orange numbers indicate adjacent map pages

Florida Adopts the USNG

- USNG was officially adopted by the FFCA
- FDEM to adopt the USNG in the States CEMP
- Updates of GIS/Maps in the 11 Regional Evacuation Studies will include USNG grids
- Florida Fire College, Florida Fire Chiefs Association, F1 National Guard to develop curriculum and instructor manuals
- FFC will be incorporating an intro module in the Firefighter II curriculum

FDEM Adopts the USNG

- **Creating downloadable shapefiles by county**
- **Will handle requests for production of shapefiles for specific areas**
- **Has made available training materials and presentations via web**
- **Working with DEP to create coordinate transformation tools available via web**
- **With Sue McLellan and others at DOF**

ESRI Adopts the USNG

- **PLTS and Military Analyst extensions contain tools to work with USNG**
- **USNG tool available for download from ArcScripts**
- **USNG toolbar available for download elsewhere on ESRI site**
- **ArcGIS 9.2 includes USNG tools**

More information...

<http://www.floridadisaster.org/gis/usng>



FloridaDisaster.org
Florida Division of Emergency Management

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United States National Grid

Lessons learned from recent hurricane seasons have taught us that standardized grid maps for search and rescue and other activities are a necessity. In an effort to standardize maps in Florida for both emergency and other operations, the State Fire Marshal, as the coordinating agency for search and rescue under the State Comprehensive Emergency Management Plan, and the Division of Emergency Management are embarking on a program to adopt the US National Grid (USNG) as the standard in Florida. This project will ensure a uniform grid mapping system across cities and counties in Florida, and will match the system used by the National Guard, the US Coast Guard and the US military when they are deployed into our state.

Florida's unique geography of miles of coastlines, multiple river corridors, and large watersheds make the use of the common Township/Range/Section grid (PLSS) all but impossible except for a handful of inland counties. As the grid approaches wetlands, river corridors and the coast line, sections become irregular in shape and can be significantly larger than the typical square mile, which is too large to accommodate the needs of ground crews.

Adoption of a national grid system has been identified as 'critical' in a number of after action reports, investigations and studies dating as far back as Hurricane Andrew. FEMA, DHS, the National GeoSpatial Intelligence Agency, and the Federal Geographic Data Committee all promote the adoption of the USNG.

Documents

[FL adopts US National Grid](#)
Summer 2006 (pdf)

[Understanding the USNG](#)
Fall 2006 (pdf)

[Style Guide Using USNG with ArcGIS \(Draft\)](#)
Fall 2006 (pdf)

[Creating USNG Polygons with ArcGIS](#)
Fall 2006 (pdf)

[Grid Reader Template](#)
Print on mylar and trim for wallet-sized grid readers