

# USNG Zone Junction

New Orleans, LA

- GIS technician training requirements emerge from Hurricane KATRINA, 2005.
- Additional issue. It has been suggested that MGRS/USNG cannot be used by aircraft supporting ground operations.

FGDC US National Grid (WG84) = Military Grid Reference System (WGS84)

See [www.fgdc.gov/usng](http://www.fgdc.gov/usng) for additional information

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# USNG Zone Junction

New Orleans, LA Example

- Training requirements emerge from Hurricane KATRINA, 2005
- “We tried to implement the USNG in New Orleans early on but based on the visual confusion of the product (see Doug’s example), it was dropped for a Lat/Long grid.”
  - FEMA, GIS Coordinator, DHS/FEMA Region X,  
Email sent: Friday, May 05, 2006 11:03

(Doug's FEMA Example)

Sample of how FEMA GIS depicted the USNG at the zone junction  
in New Orleans, LA during Hurricane KATRINA, 2005.

Warning: This is *not* how the USNG zone junction is cartographically handled  
and this method does not work with low-cost GPS receivers.

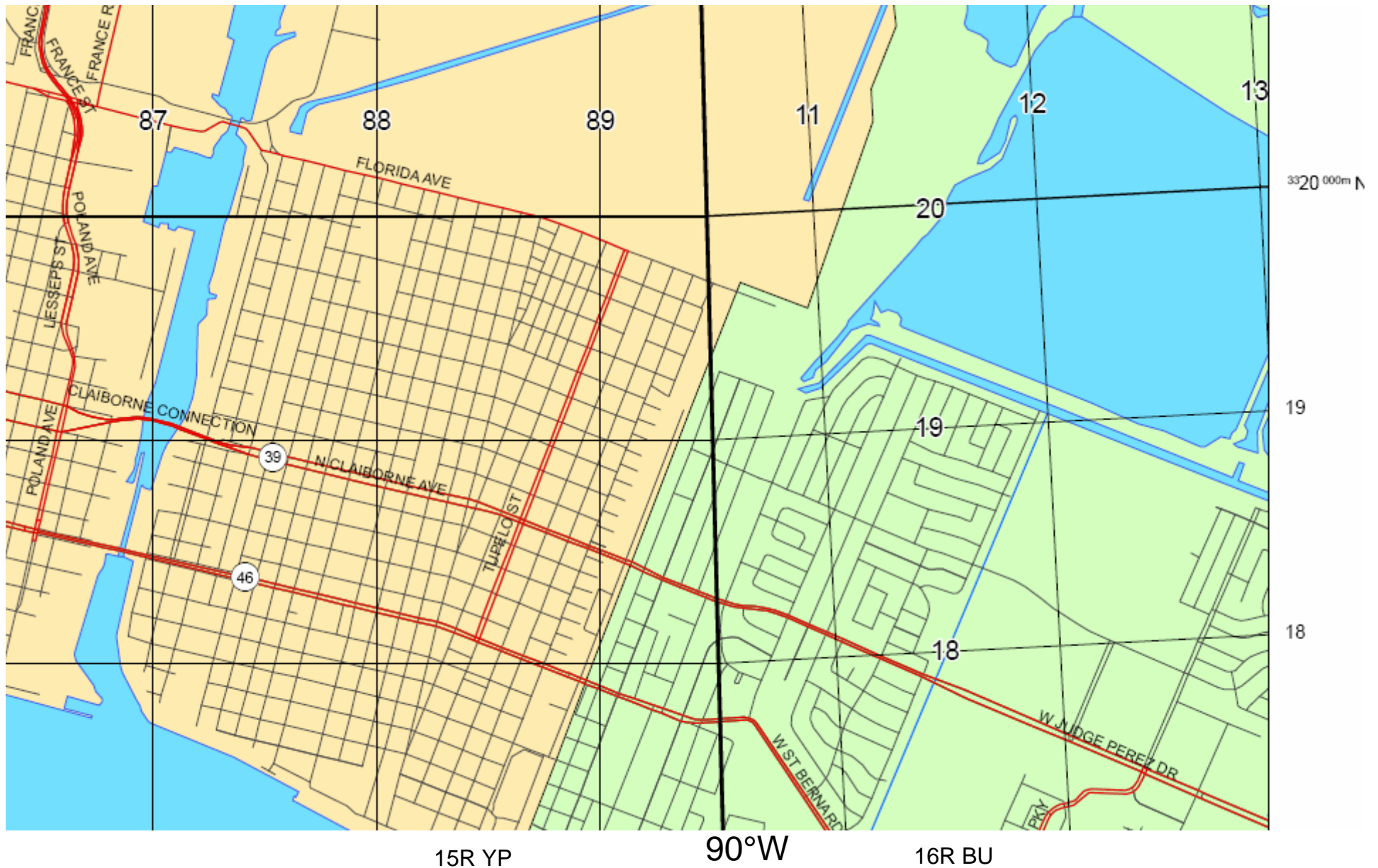
## New Orleans - Lower 9th Ward

National Grid (500M) - **Zone 15** & **Zone 16**



# USNG Zone Junction

- Proper way to handle the grid at zone junction:
  - Survey ops: Uses UTM numerical coordinates. Extend one zone across into the other (*not both*). Carry survey across and then establish control in new zone.
  - Point locations: Uses USNG alpha-numeric format.
    - Do not extend zones across into adjacent zones. Each point has an absolute value based on the zone that point is located in.



Sample of NGA produced map with properly depicted USNG/MGRS grid at the junction of UTM zones 15 / 16.





Examining use of the USNG/MGRS in the field across a range of technologies;

- paper to integrated GPS/INS
- at the UTM Zone Junction.
- air/ground operations.

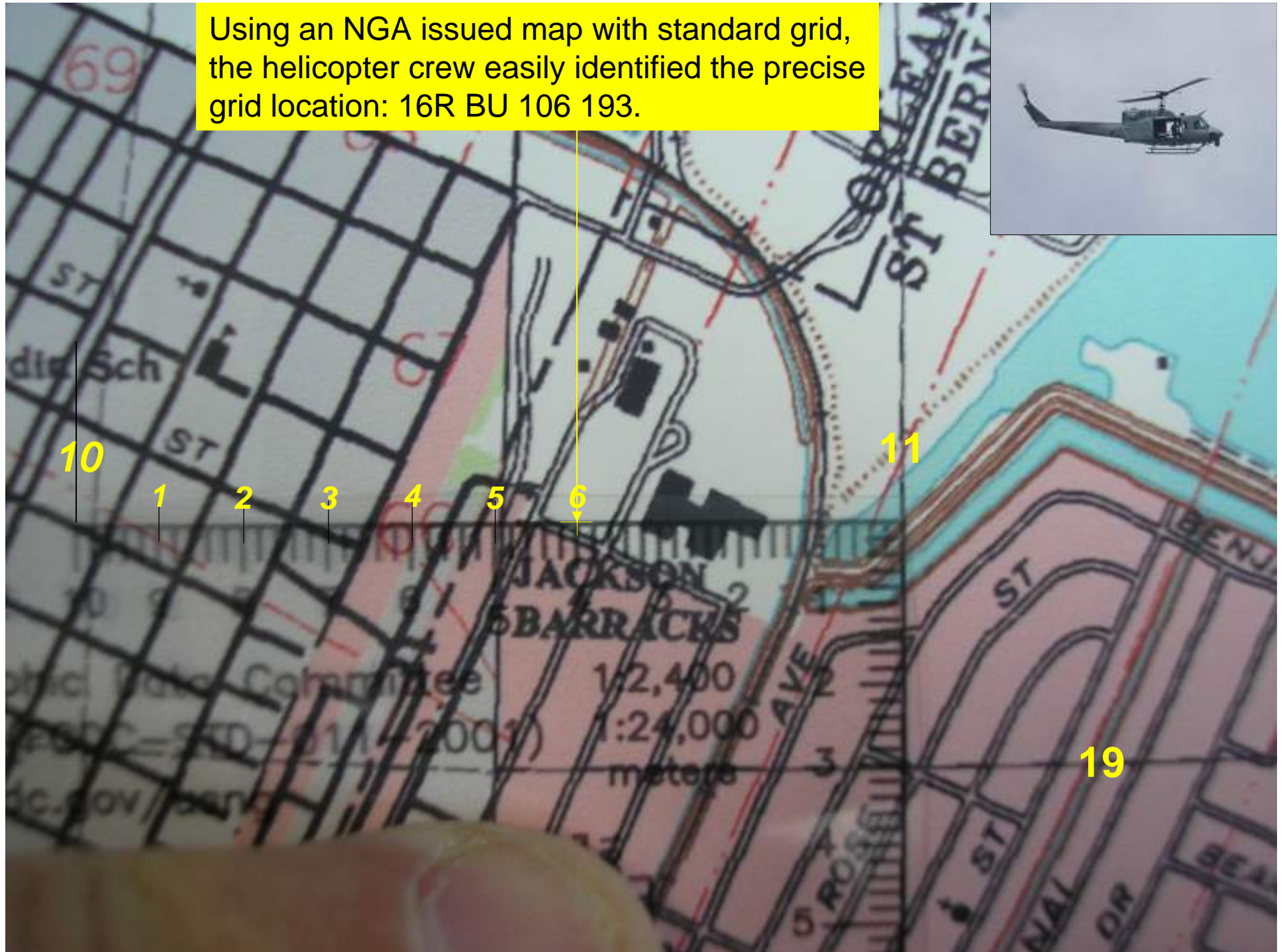
New Orleans, LA, 22 August 2006

Ground location scaled from  
paper USGS 1:24,000 topo:  
Grid: 106 193 or 16R BU 106 193





Using an NGA issued map with standard grid, the helicopter crew easily identified the precise grid location: 16R BU 106 193.





The helicopter crew also loaded the coordinates into their integrated GPS/INS navigation system, grid 16R BU 106 193.



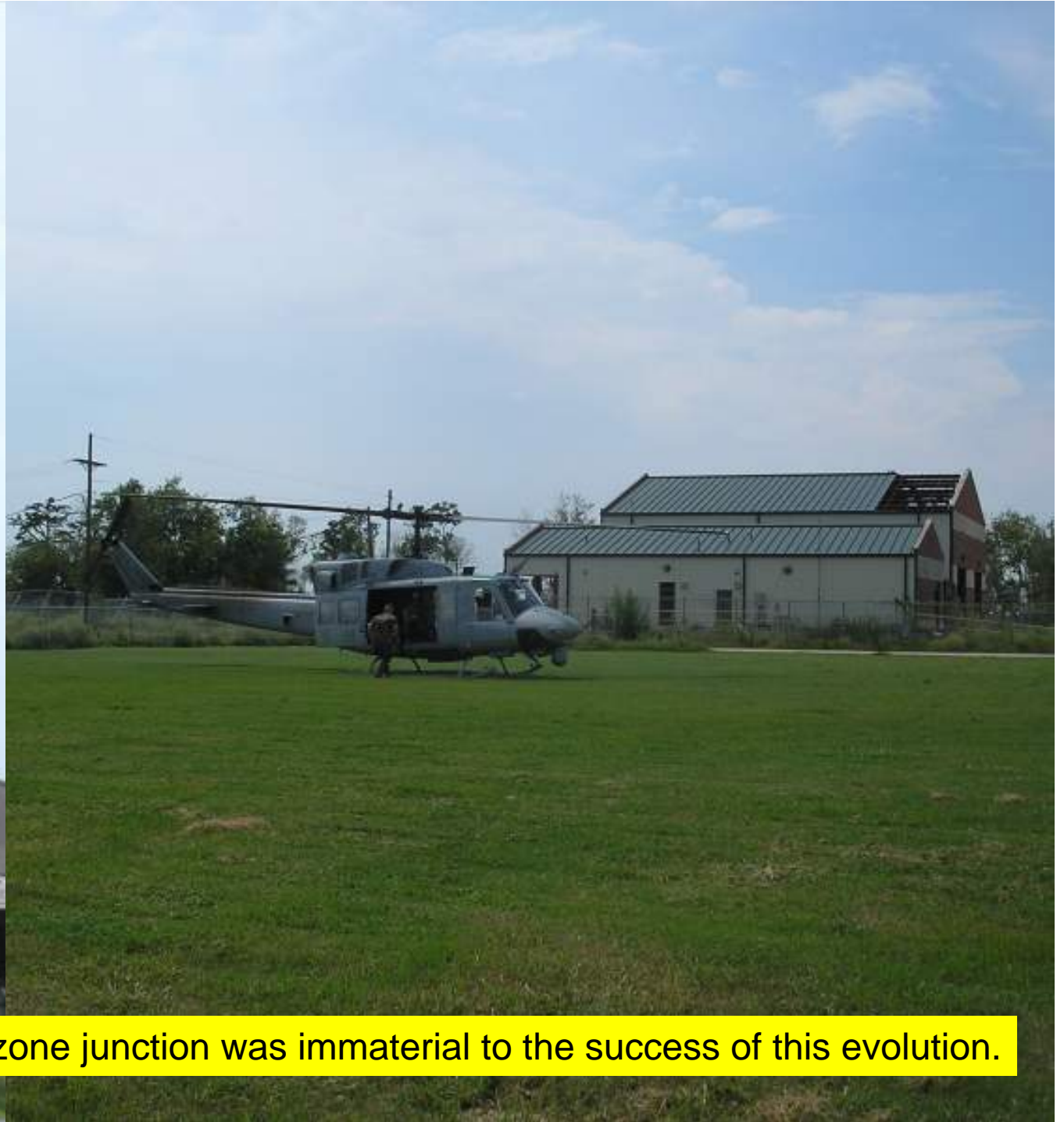
The FLIR can be slaved to the GPS/INS to stare at the point.





The crew looks from big to little features on the map and ground as they orient themselves to the point of interest. The FLIR can aid in situational awareness.

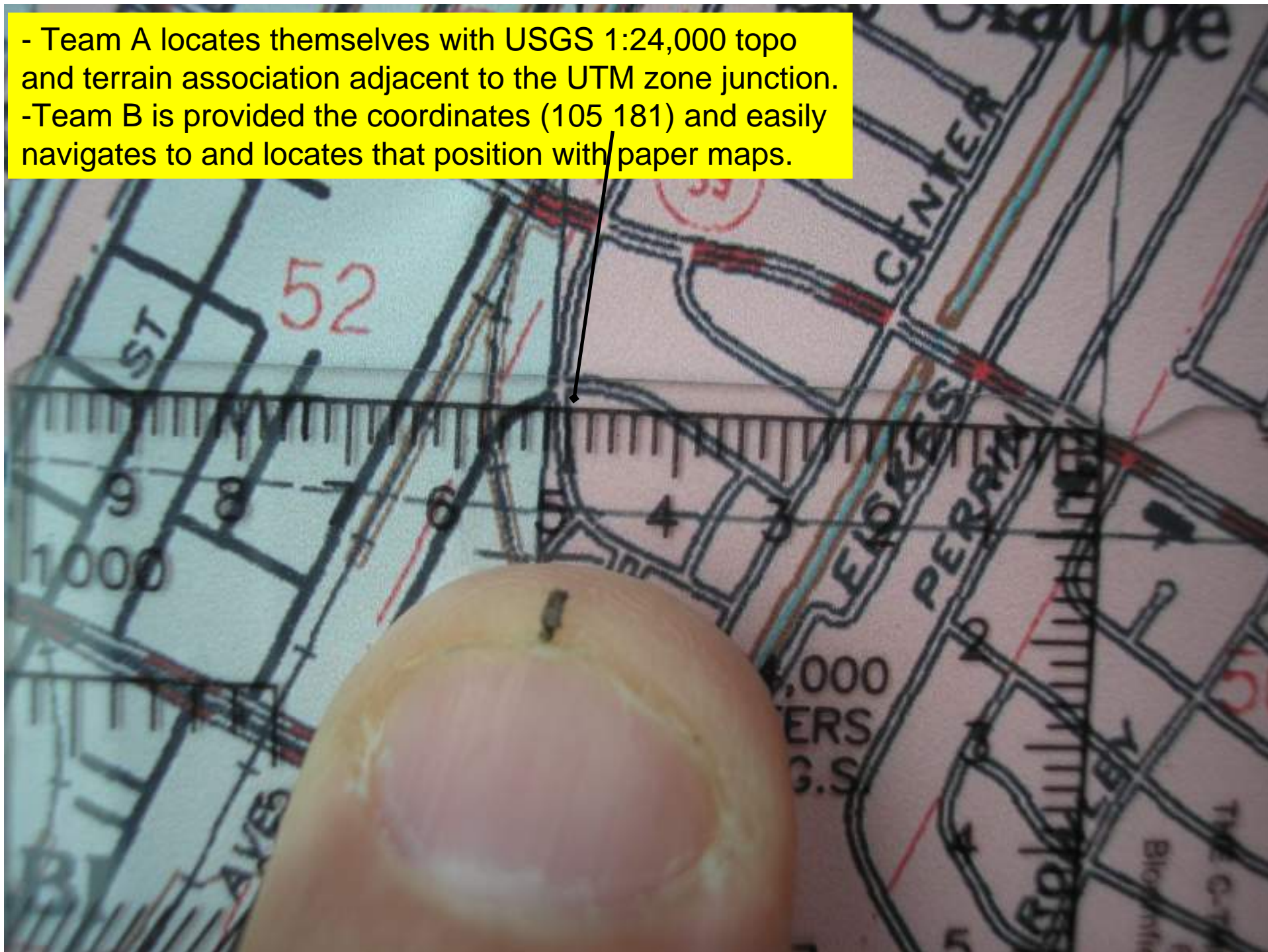




The grid zone junction was immaterial to the success of this evolution.



- Team A locates themselves with USGS 1:24,000 topo and terrain association adjacent to the UTM zone junction.
- Team B is provided the coordinates (105 181) and easily navigates to and locates that position with paper maps.





- DAGR and Garmin GPS receivers confirm coordinates upon arrival.  
Note the lack of street name signs in this area.

# Old Lessons Re-Learned

- The UTM zone junction is functionally a non-issue.
- USNG is user friendly across a wide range of geospatial products – from paper to digital.
- Aircraft supporting the ground... should support ground operations. It's cultural, not technical.

## *Other lessons from this evolution:*

- We need USNG gridded USGS 1:24,000 topos.
- 1:24,000 topos are essential for US operations.
  - Their rich data and features make them operationally essential in the US.
  - Enable successful urban navigation (day and night) without street name signs (and w/ or w/out GPS).
  - *But they must have full grid referenced to NAD-83.*
    - *NOT NAD-27!*



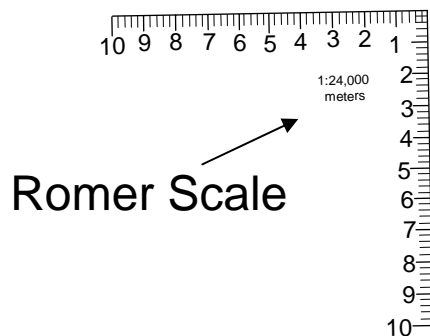
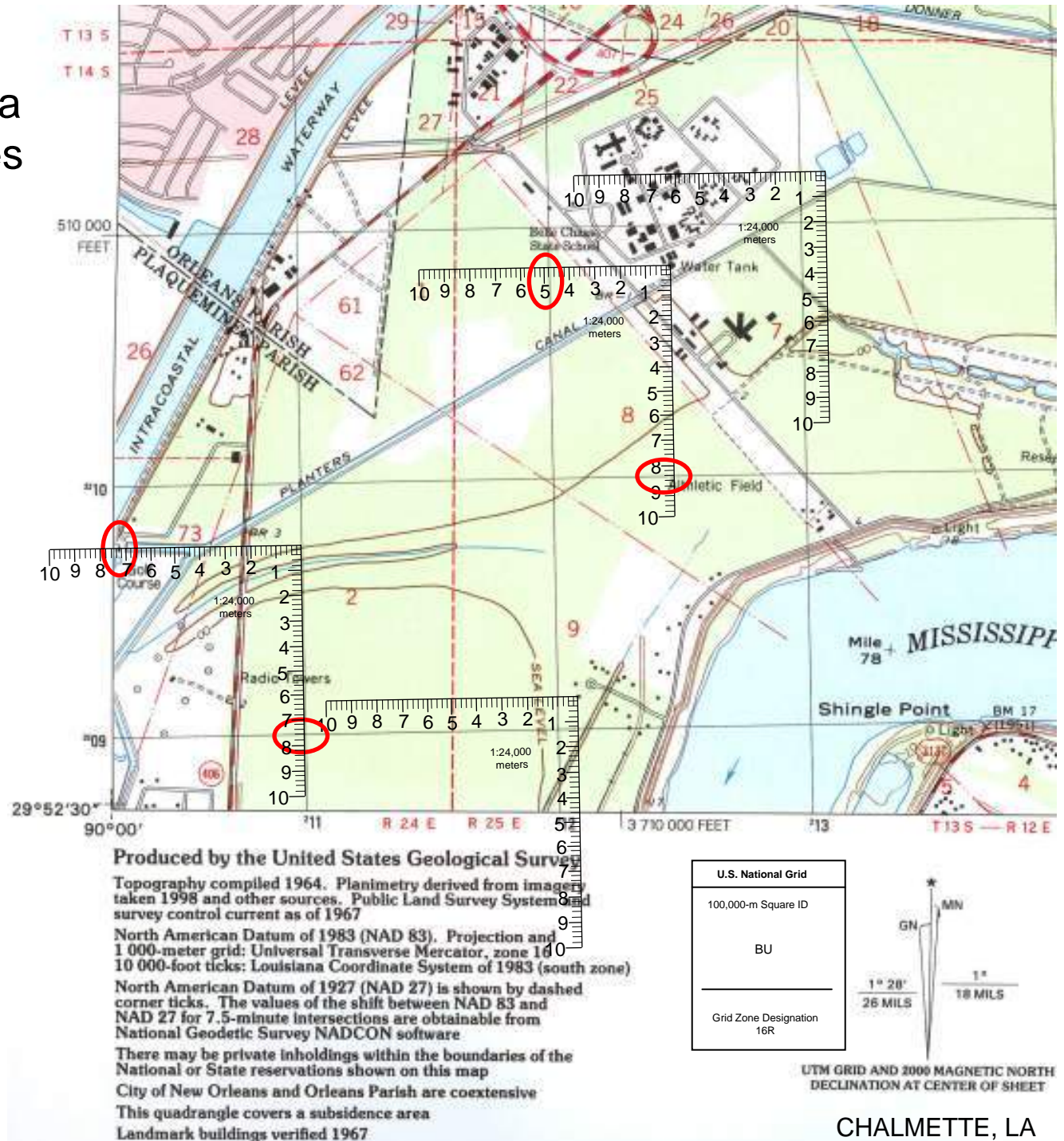
Between two people in a local area these features can be reported as:

“Pond at grid: 131112.”

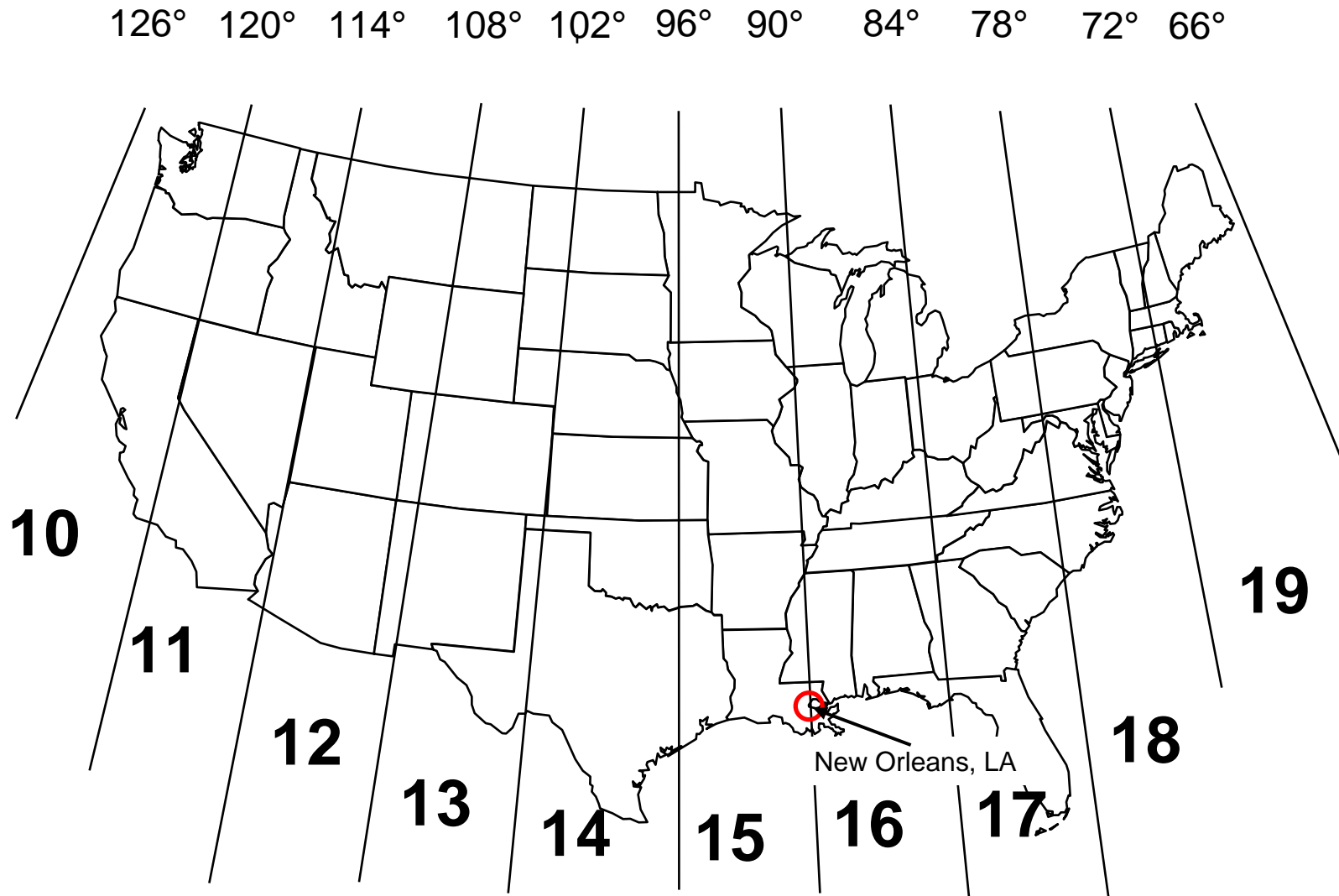
“Water Tank at grid: 1248 1084.”

“Building at grid: 1208 0913.”

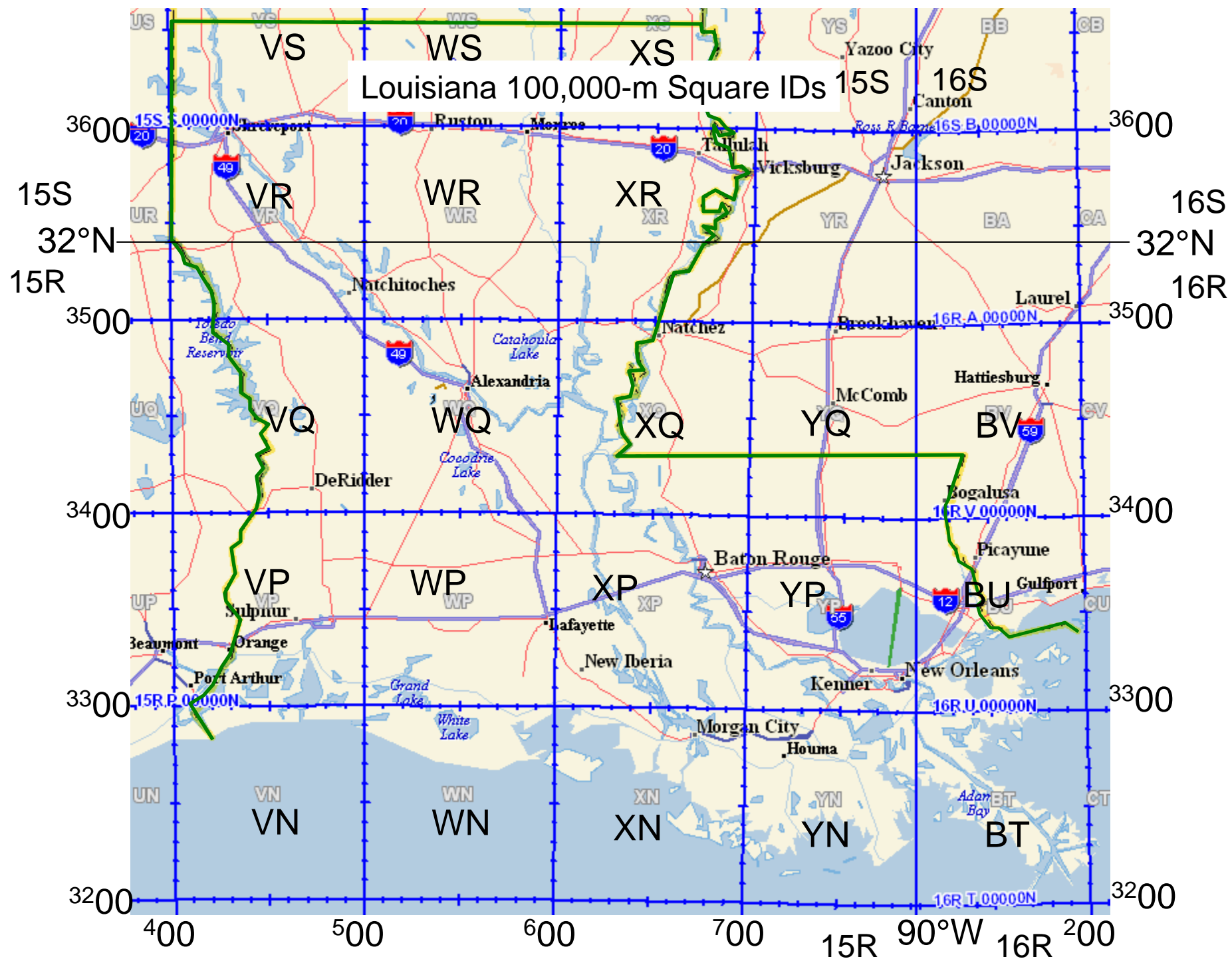
“Building at grid: 1027 0976.”



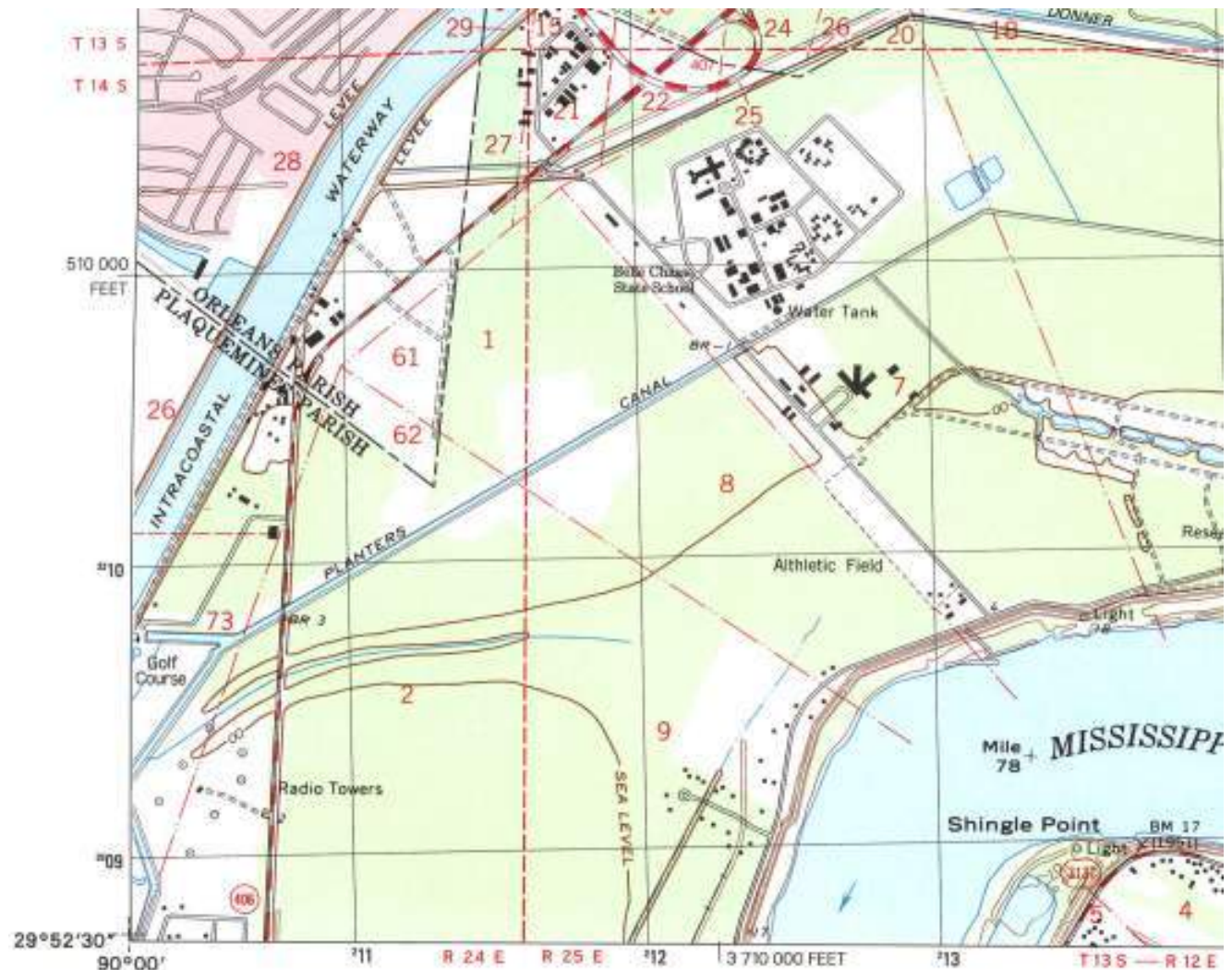
# UTM Grid Zones



All plane coordinate systems have zone junctions. A characteristic of the UTM system is the minimum number of uniform zones that cover the US while retaining desired attributes. The figures in this brief illustrate how zone junctions do not pose a problem to US National Grid users. This is because the grid is overlaid on the lat/long graticule, and while digital systems (i.e. GPS receivers and GIS) display USNG values for our ease of use, the underlying calculations are using lat/long.







### Produced by the United States Geological Survey

Topography compiled 1964. Planimetry derived from imagery taken 1998 and other sources. Public Land Survey System and survey control current as of 1967

North American Datum of 1983 (NAD 83). Projection and 1 000-meter grid: Universal Transverse Mercator, zone 16 10 000-foot ticks: Louisiana Coordinate System of 1983 (south zone)

North American Datum of 1927 (NAD 27) is shown by dashed corner ticks. The values of the shift between NAD 83 and NAD 27 for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software

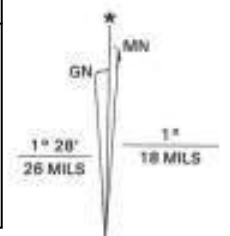
There may be private inholdings within the boundaries of the National or State reservations shown on this map

City of New Orleans and Orleans Parish are coextensive

This quadrangle covers a subsidence area

Landmark buildings verified 1967

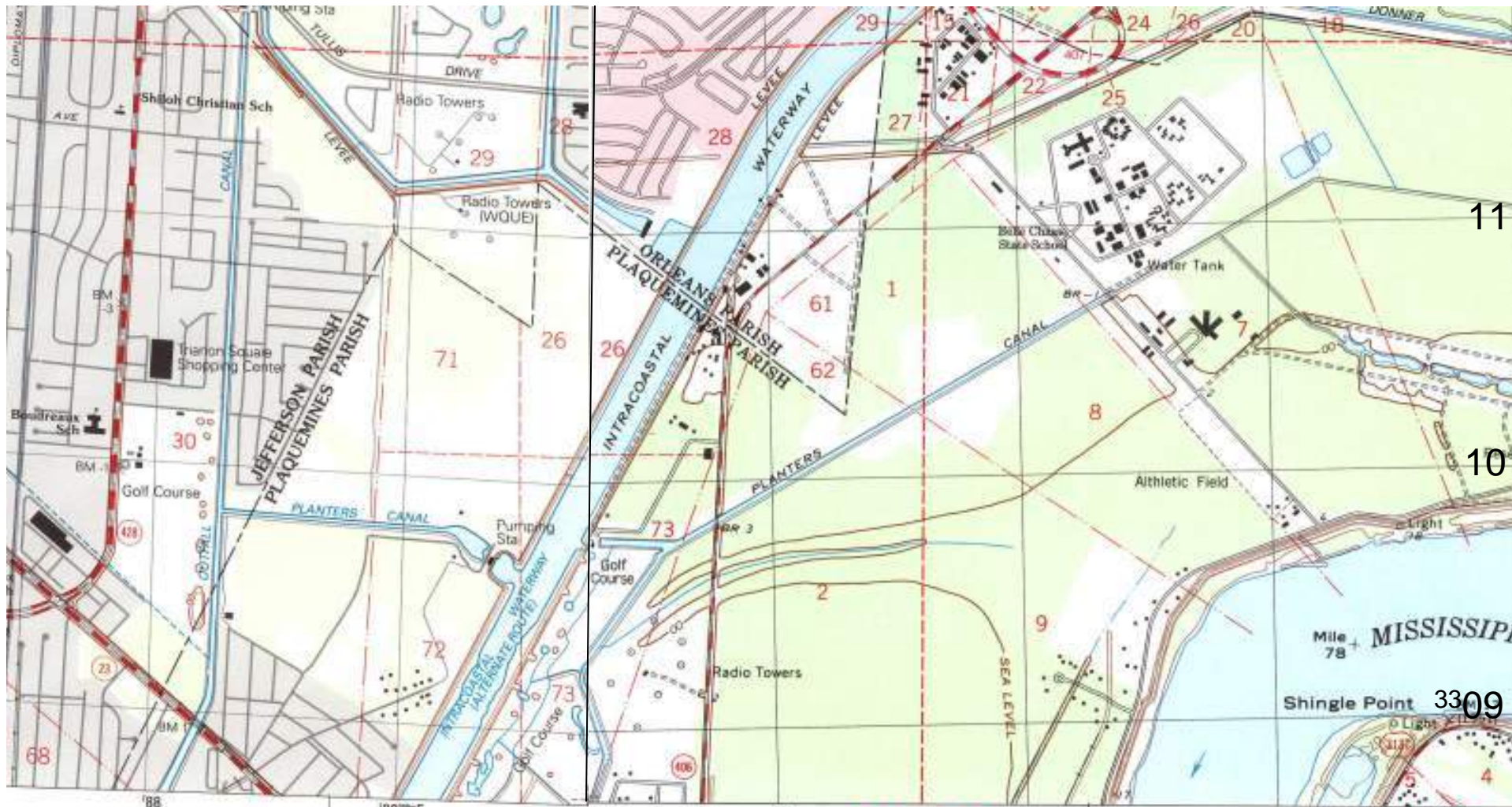
U.S. National Grid
100,000-m Square ID
BU
Grid Zone Designation 16R



UTM GRID AND 2000 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

CHALMETTE, LA





INTERIOR - GEOLOGICAL SURVEY, RESTON, VIRGINIA - 2000

#### ROAD CLASSIFICATION

- |   |  |
|---|--|
| Primary highway<br>hard surface .....   | Light-duty road, hard or<br>improved surface ..... |
| Secondary highway<br>hard surface ..... | Unimproved road .....                              |
| Interstate Route                        | U.S. Route   |
|   | State Route  |

NEW ORLEANS EAST, LA

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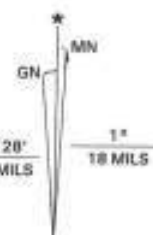
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U.S. National Grid	
100,000-m Square ID	
YP	BU
90° W	
Grid Zone Designation	
15R	16R
90° W	



UTM GRID AND 2000 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

CHALMETTE, LA



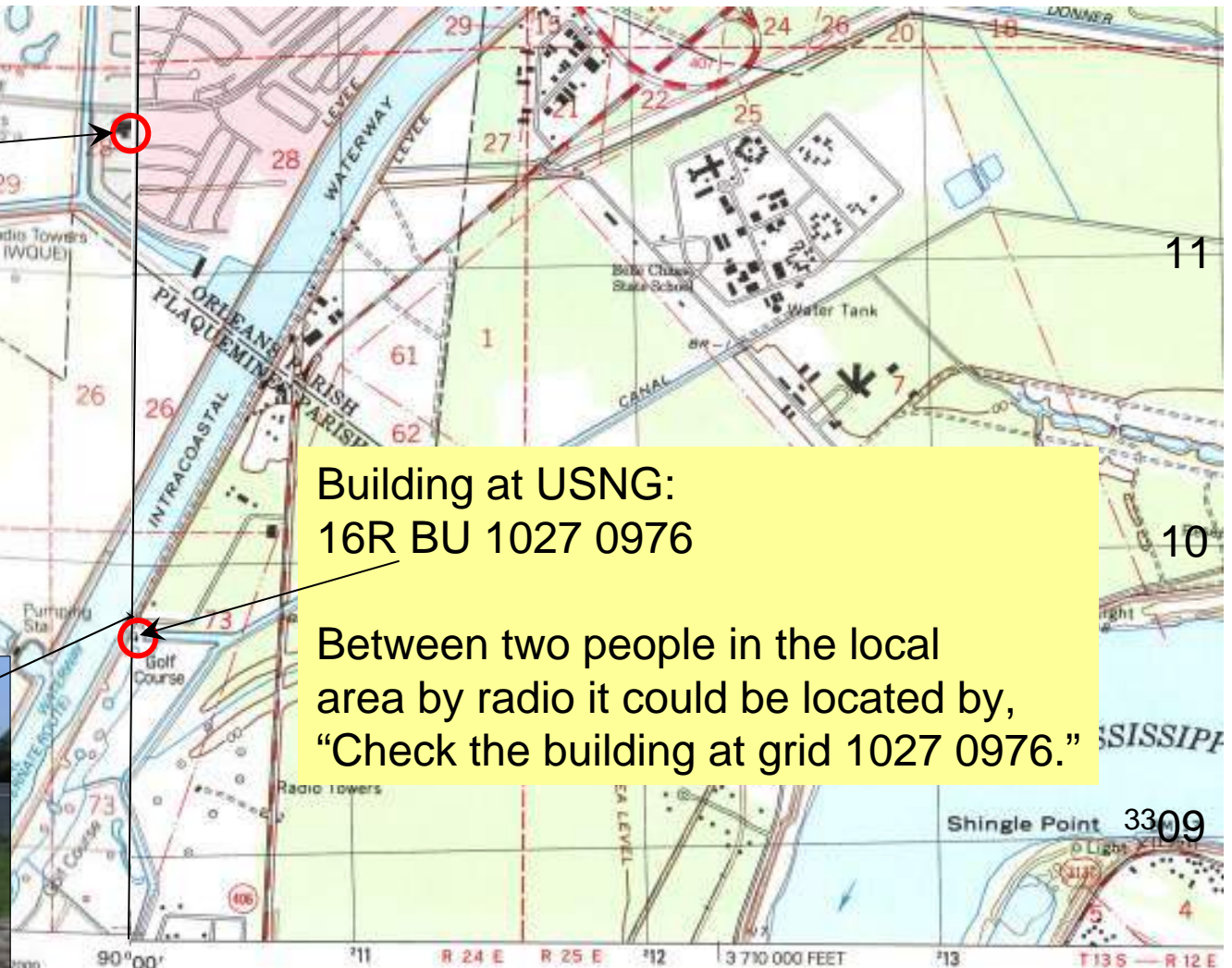
Building at USNG:  
15R YP 8968 1150

Building at USNG:  
16R BU 1027 0976

Between two people in the local  
area by radio it could be located by,  
"Check the building at grid 1027 0976."



NEW ORLEANS EAST, LA



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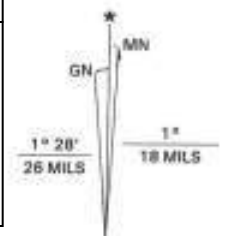
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YP	BU
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UTM GRID AND 2000 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

CHALMETTE, LA





# The National Map Viewer

Overview

Zoom In

Zoom Out

Zoom

Back

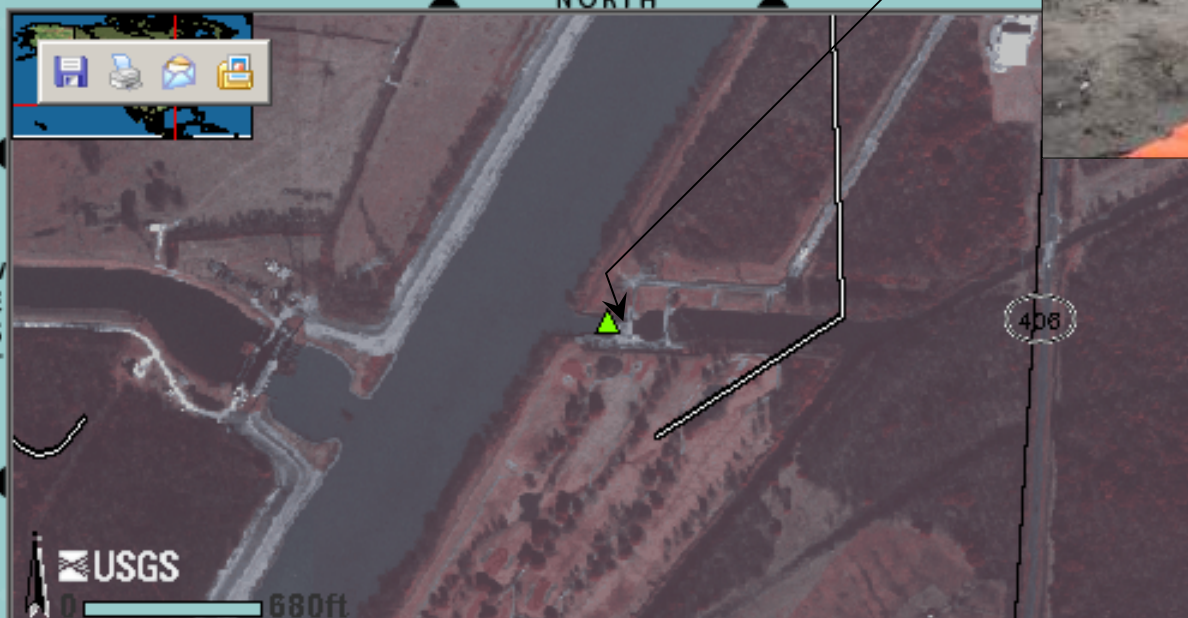
Find Place

Full Extent

Re-center

Identify

Elevation



Lon: -89° 59' 59"

Lat: 29° 53' 04"

USNG: 16R BU 10271 09761 (NAD83)

Partners: U.S. Forest Service | U.S. Fish & Wildlife Service | USGS | NOAA | TerraServer USA | BTS | CENSUS

U.S. Department of the Interior, U.S. Geological Survey | Contact: National Map Team

URL: <http://nmviewwgc.cr.usgs.gov/> | Last modification: 09/14/2005

[Privacy Statement](#) | [Disclaimer](#) | [FOIA](#) | [Accessibility](#)

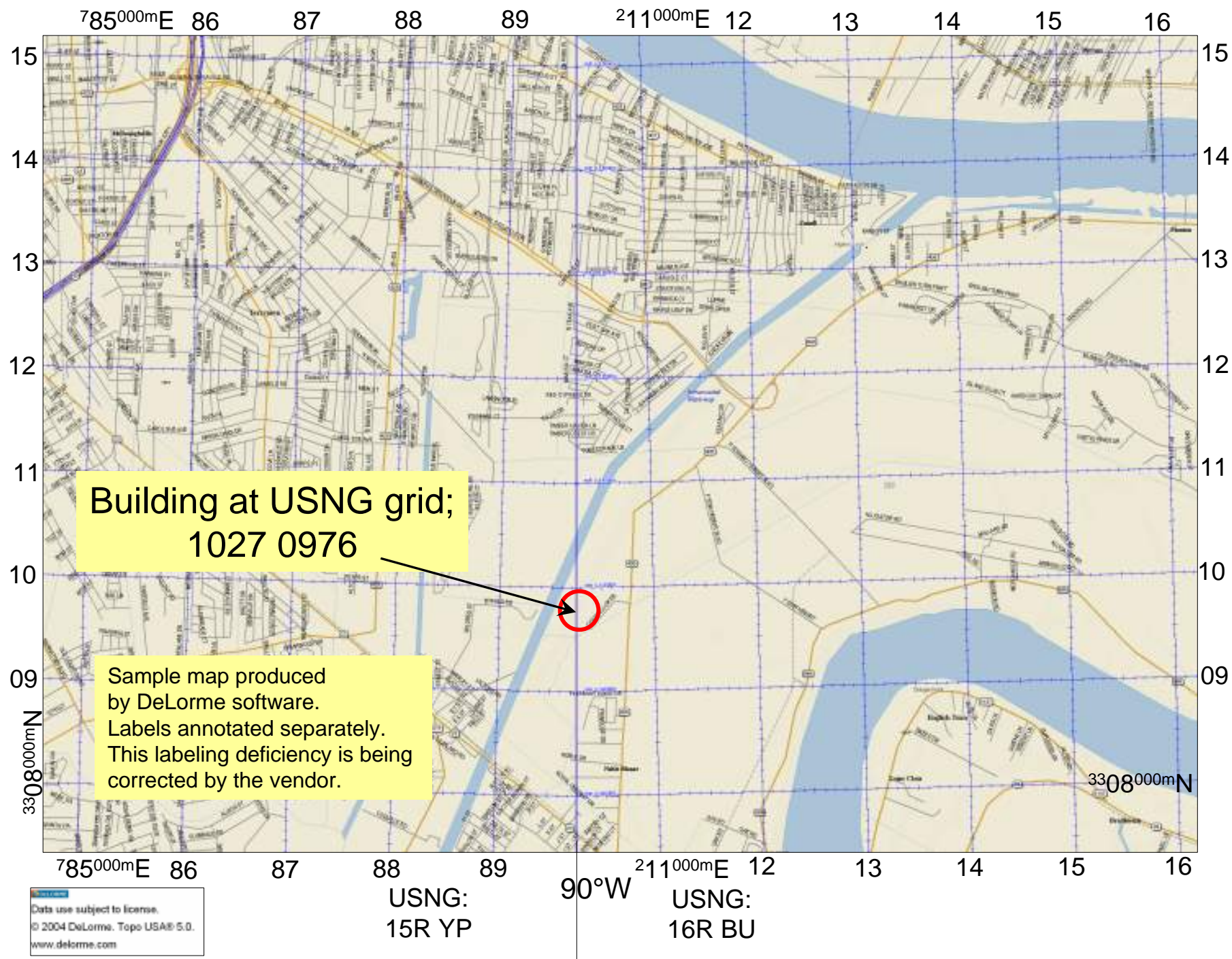


Layers Legend

Imagery

- ☒ DOQ
- ☐ TerraServer USA DOQ
- ☒ USGS DOQ 210 (Color)
- ☒ USGS DOQ 229 (Color)
- ☒ INDEX/STATUS (IMAGERY)
- ☐ NDOP Project Tracking

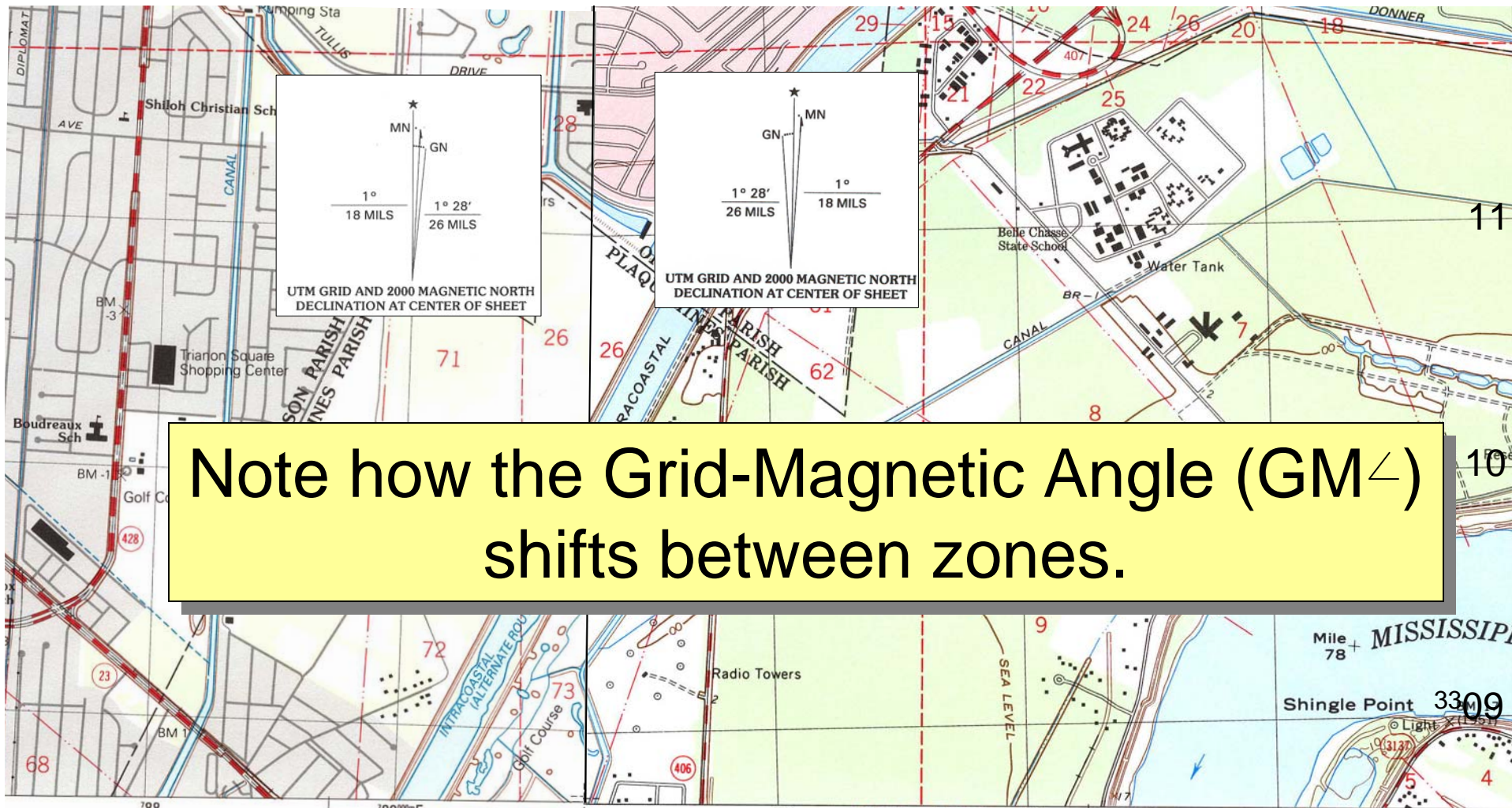
Refresh Map



Back up slides

For information, see:  
[www.fgdc.gov/usng](http://www.fgdc.gov/usng)





Note how the Grid-Magnetic Angle (GMA) shifts between zones.

INTERIOR - GEOLOGICAL SURVEY, RESTON, VIRGINIA - 2000 90°00' 211 R 24 E R 25 E 212 3 710 000 FEET 213 T 13 S — R 12 E

#### ROAD CLASSIFICATION

- |   |  |
|---|--|
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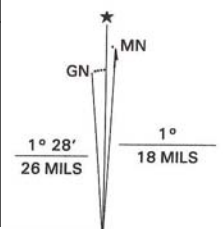
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