

# GPS Efforts in Minnesota

Rick Morey, LS

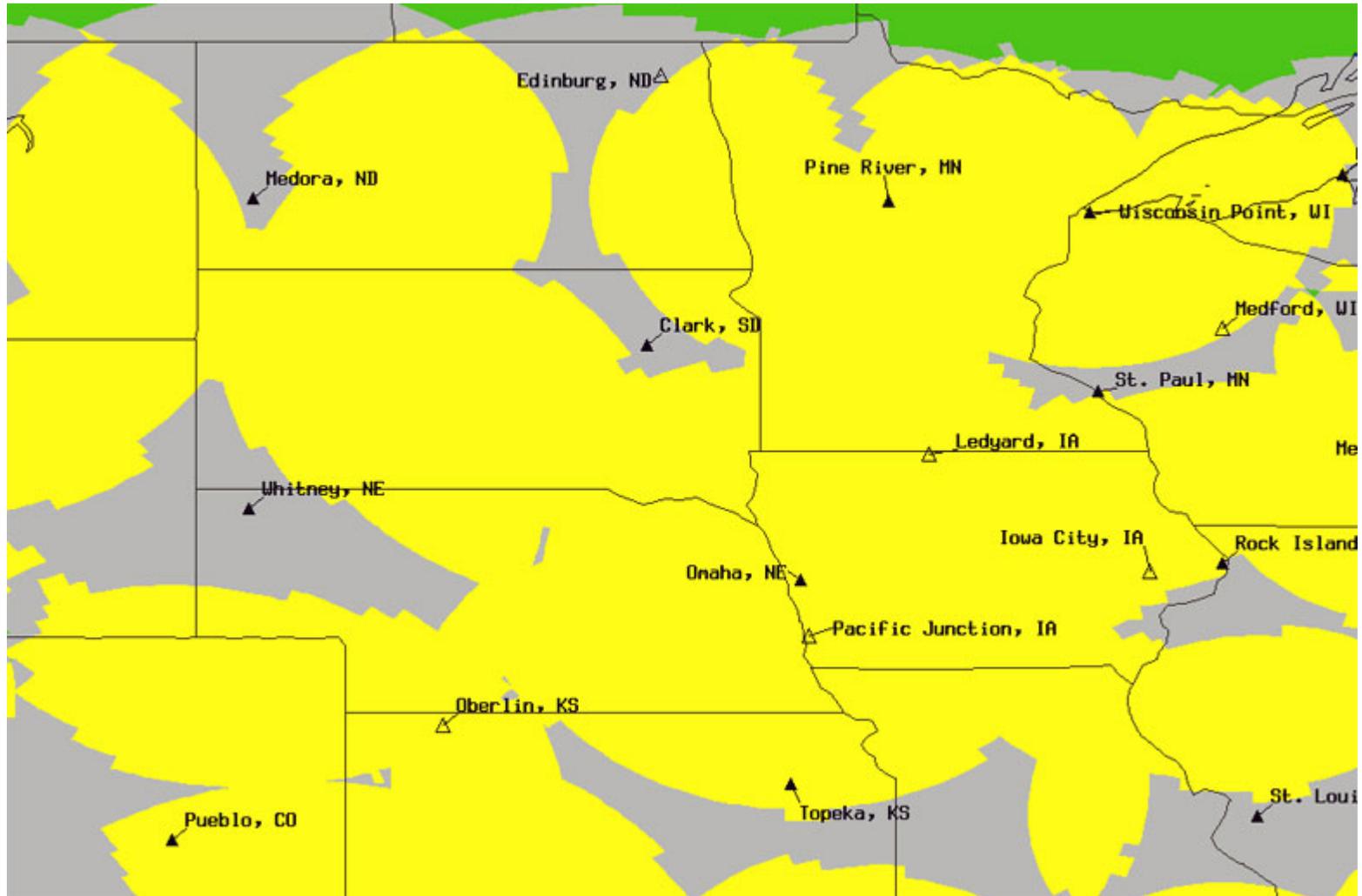
Asst. Dir., Surveying & Mapping

Office of Land Management, Mn/DOT

# Topics

- NDGPS
- NGS CORS
- Mn/DOT CORS/VRS
- Other Uses
- Comments/Questions

# NDGPS



<http://www.navcen.uscg.gov>

# NDGPS

## Users

- State Government
- Local Government
- Education
- Developers
- GIS community
- Survey Community
- Forest Resources Industry

# NDGPS

## Uses

- Asset Management
- Engineering
- Resource Management
- Emergency Management
- Zoning & Planning
- Education

# NDGPS

## Wish List

- Continued Support/Expansion
  - Letter of support
  - Dual coverage statewide
- Integration
  - NTRIP

# NGS CORS

**Operator:**

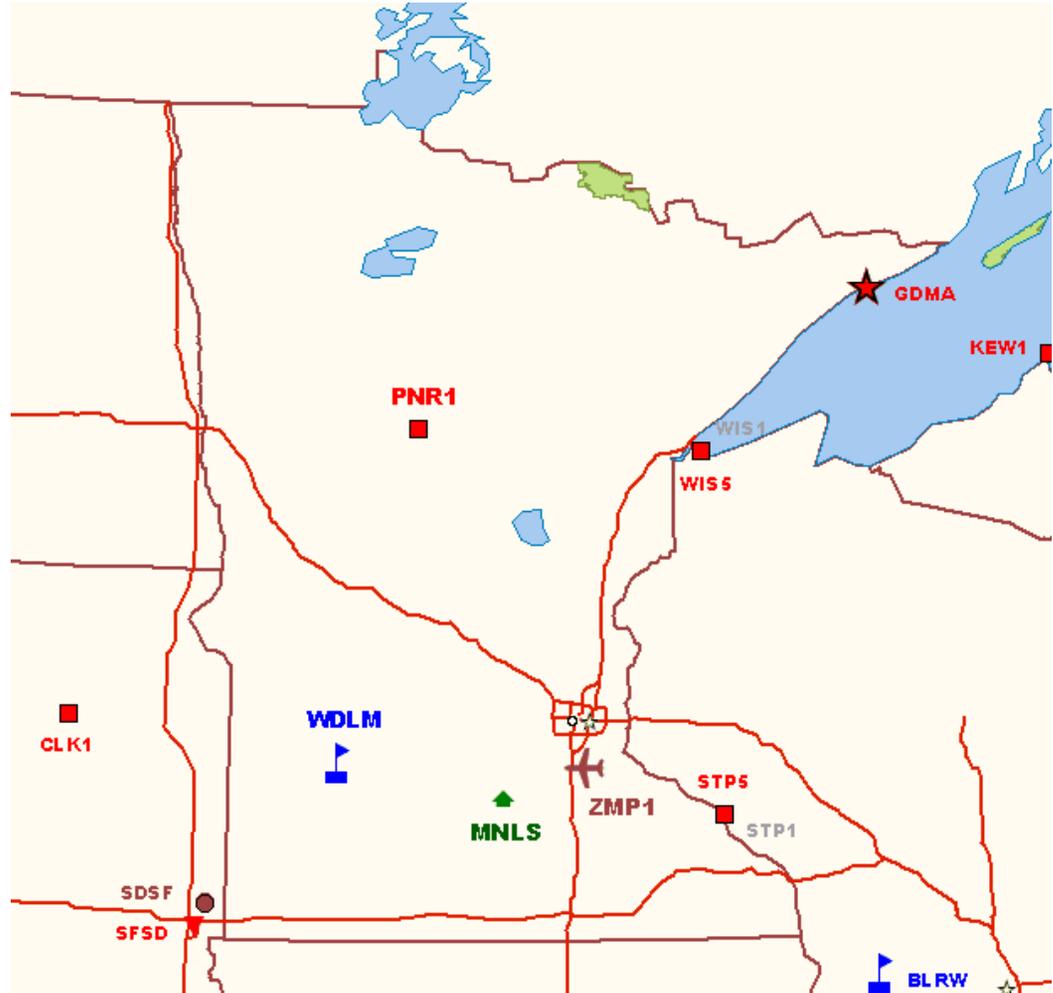
- ★ NOAA/NGS
- 🚧 NOAA/GSD
- ♣ STATE
- NDGPS
- ✈ FAA
- ⦿ PBO
- INEGI
- OTHER
- ▼ COOP

**Original Sampling Rate:**

- 1 second
- 5 seconds
- 10 seconds
- 15 seconds
- 30 seconds

*Decommissioned*

Data are decimated to 30 sec rate after 30 days



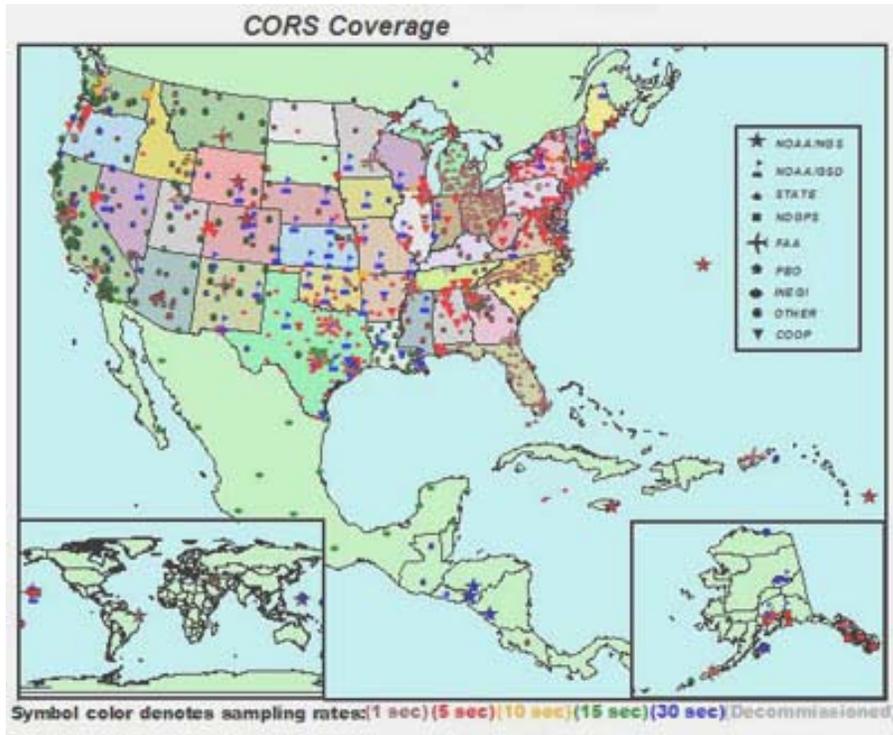
<http://www.ngs.noaa.gov/CORS/>

# NGS CORS

## Users/Uses

- State Government
- Local Government
- Private Surveying Community
- OPUS
- Mn CORS Adjustments

# NGS CORS

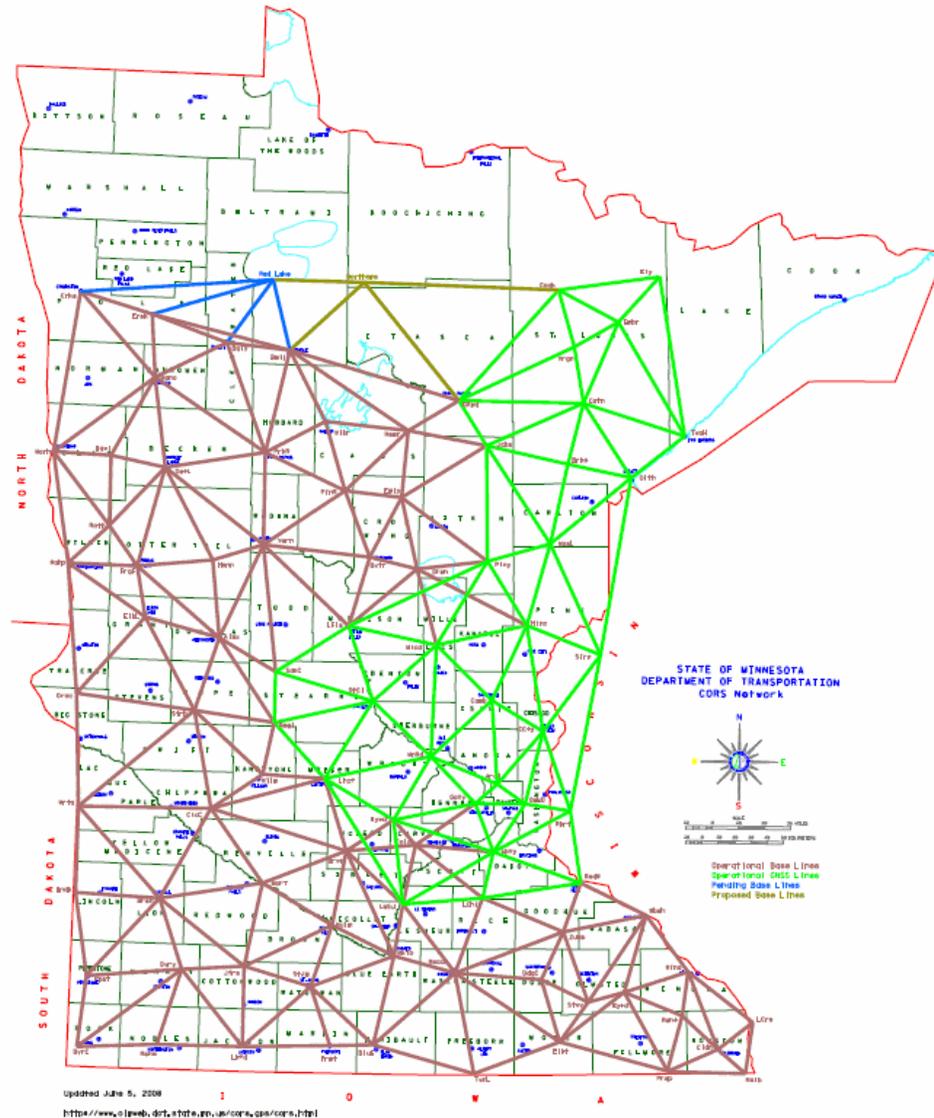


## Integration

1500 stations/6 in MN  
80 submitted over 2 yrs  
25 more coming  
NTRIP  
Common Adjustment

<http://www.ngs.noaa.gov/CORS/>

# MN CORS/VRS



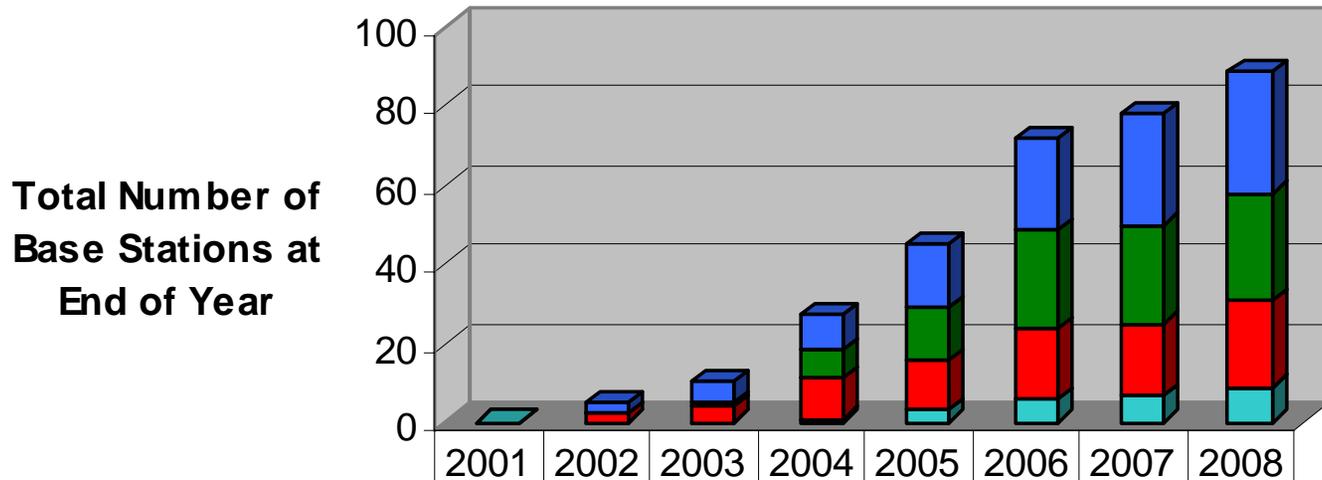
<http://www.olmweb.dot.state.mn.us/CORS.GPS/cors.html>

# MN CORS/VRS

- 89 Stations
- 24/7
- Post Process (Rinex)
- RTK (cell phone modem, CMR+ or RTCM)
- Free
- CM Accuracy

# MN CORS/VRS Stations

Base Station Locations



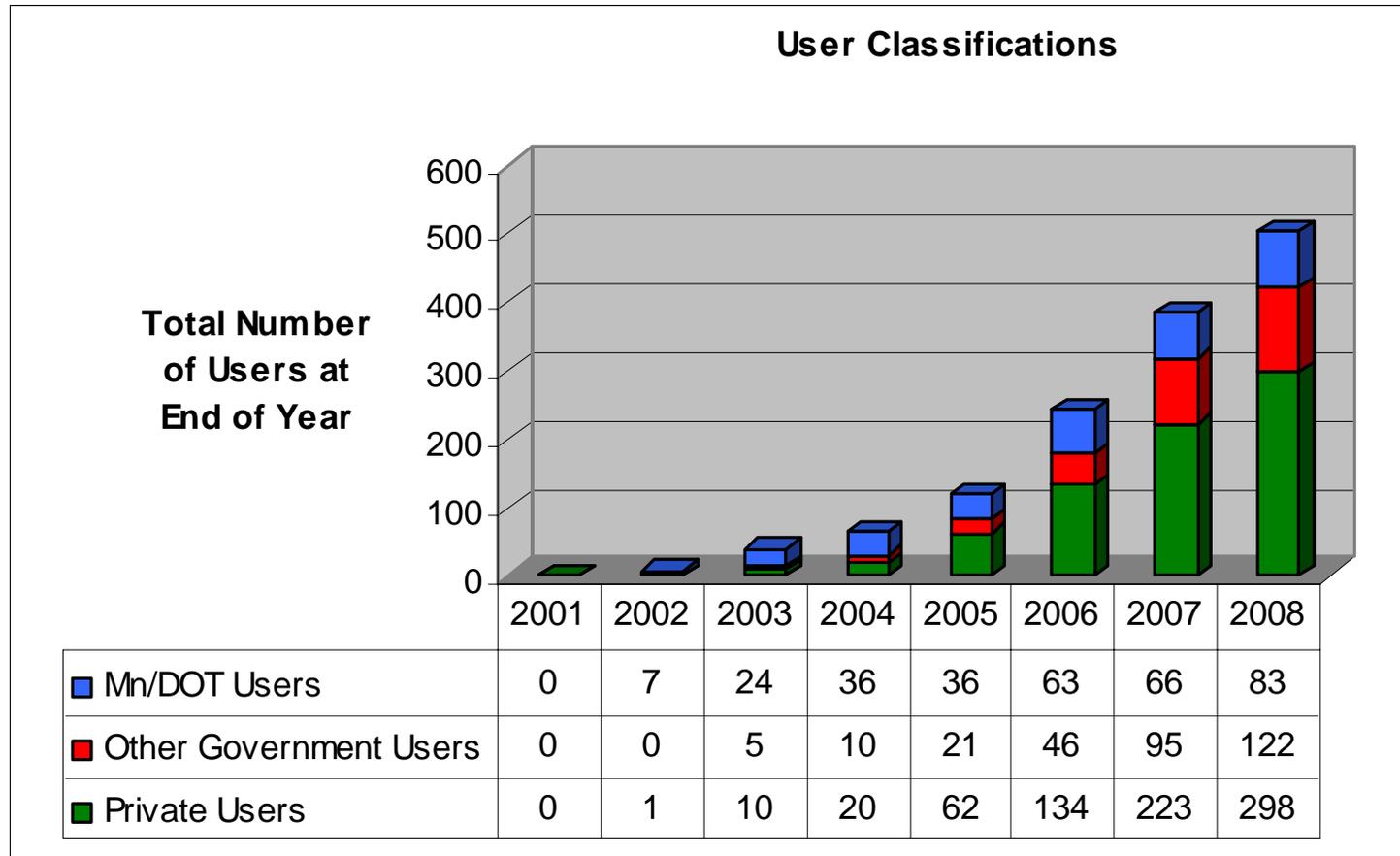
■ Mn/DOT Building	0	3	5	9	16	23	28	31
■ Mn/DOT RWIS	0	0	1	7	13	25	25	27
■ County Building	0	2	4	10	13	18	18	22
■ Other	0	0	0	1	3	6	7	9

# MN CORS/VRS



# MN CORS/VRS

## Users



# MN CORS/VRS

## Uses



# MN CORS/VRS

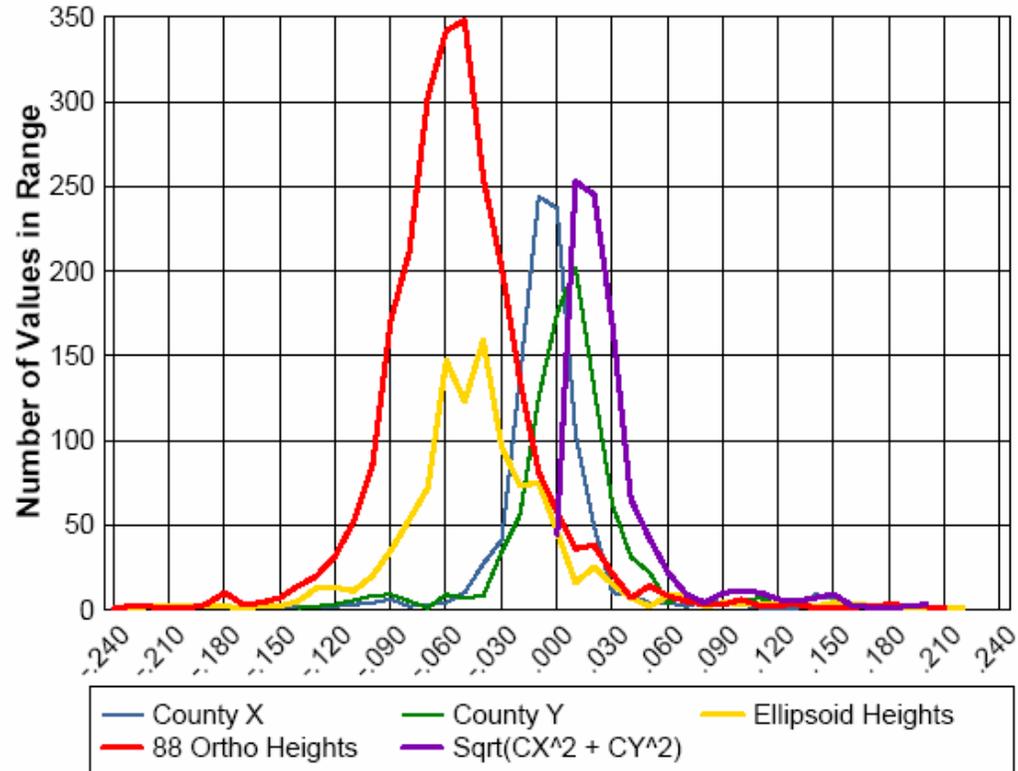
## Limitations

- Support
- Geographic Coverage
- Cell Phone Coverage
- Bias

# MN CORS/VRS

NAD 96

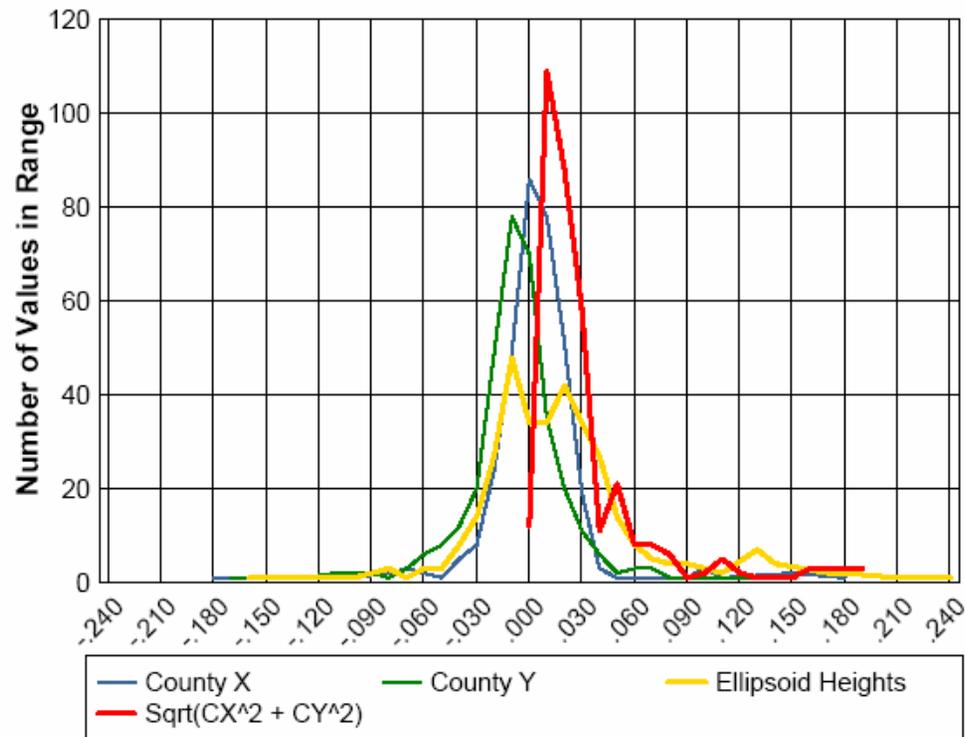
## Coordinate Differences (Meters)



# MN CORS/VRS

TRS 2007

## Coordinate Differences (Meters)



# MN CORS/VRS

## Future Plans

- Geographic Expansion
- GNSS
- Cross Border

# Soapbox

- Ownership
- Access
- Obligation
- National Network

# Comments/Questions

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