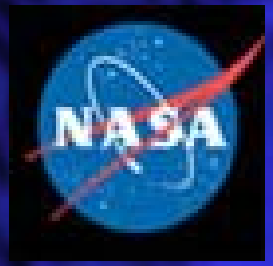
Spatially constant trends among GPS ground control points within Southeastern Idaho

Chris Moller, Luke Sander & Thomas K. Windholz

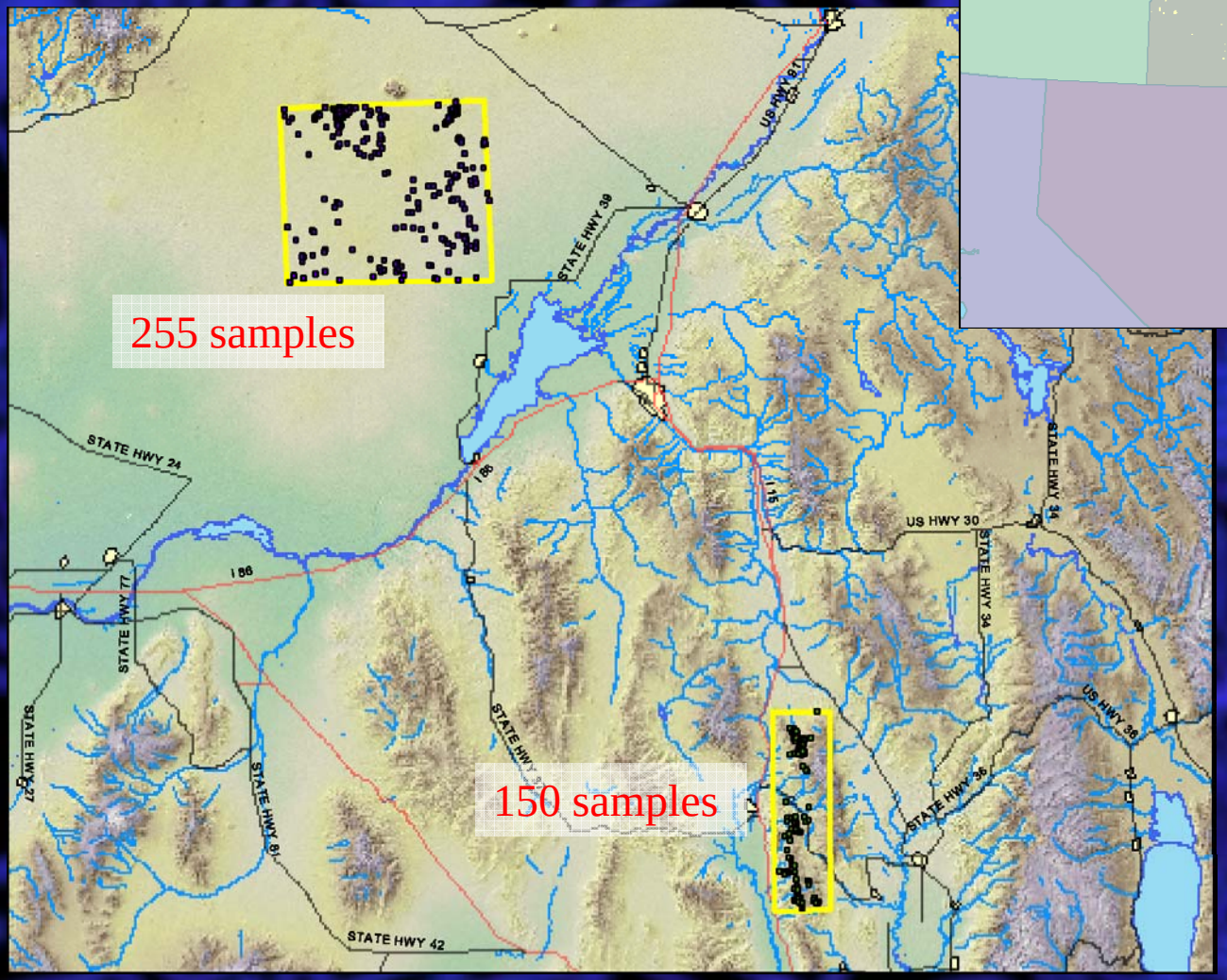
Idaho State University GIS Training and Research Center

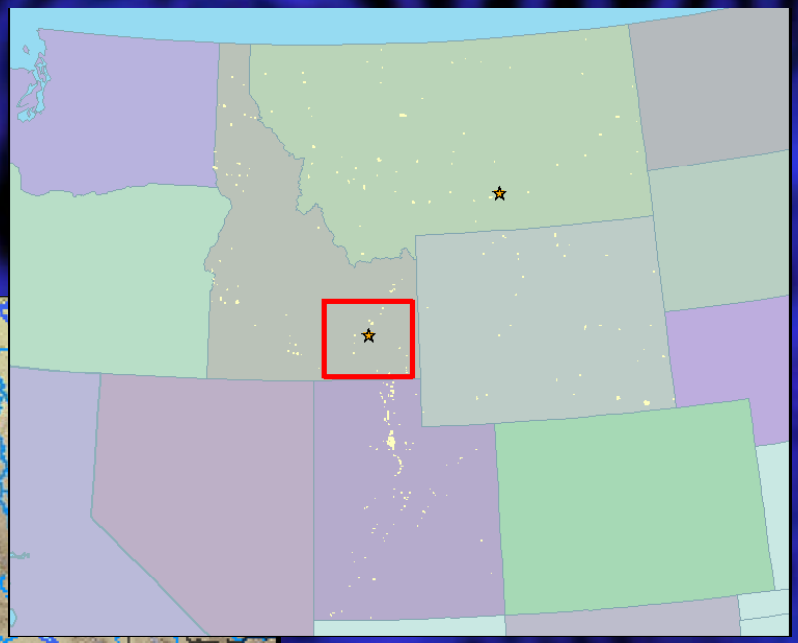


Outline

- Study area
- Project background
- Goals
- Methods
- Analysis
- Results
- Discussion/Conclusions

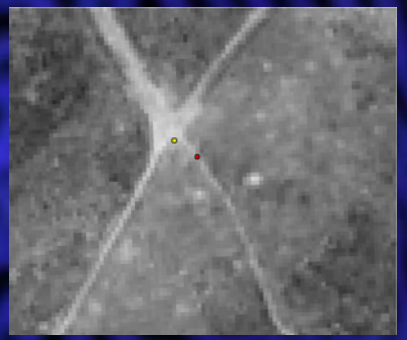
Study Area


255 samples
150 samples
STATE HWY 24
STATE HWY 77
STATE HWY 27
STATE HWY 81
STATE HWY 42
STATE HWY 38
US HWY 91
I 86
I 15
US HWY 30
STATE HWY 34
US HWY 36
STATE HWY 36



Project Background

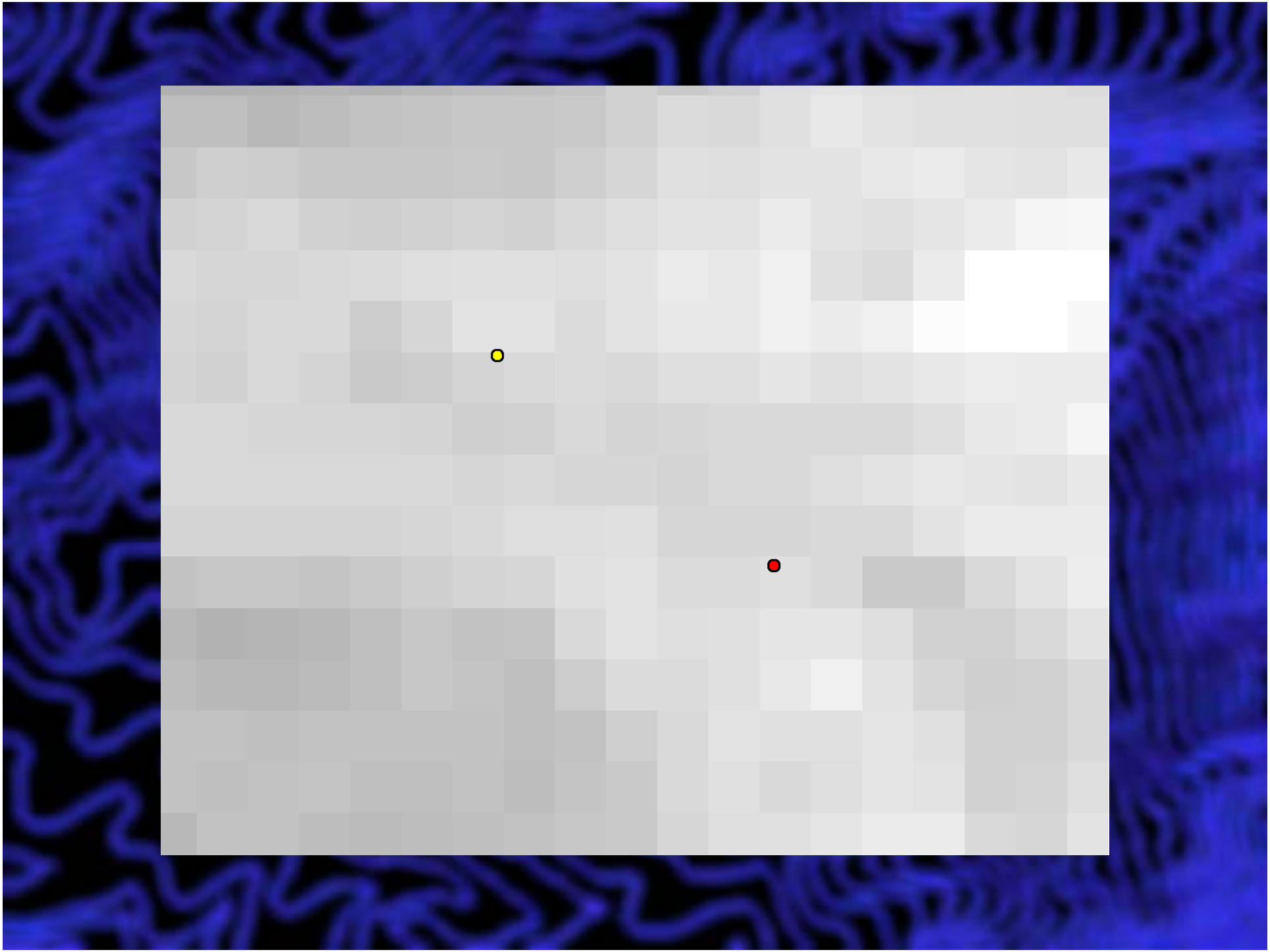
- Over 400 sampling points collected
- ArcPad transformed (WGS84 to NAD27)
- Observed 17 meter data offset
- Could not undo offset/error
- Time constraints produce field work
- Too much error for high resolution imagery
- (Need to quantify offset spatial behavior)
- investigate



Project Goals

- Determine what spatial dependencies exist in spatial errors introduced by ArcPad datum transformation

- Transform data points to represent the observed trends between datums



Methods

Points collected in WGS84

Transformed into NAD27 (Arc)

17 meter observed offset

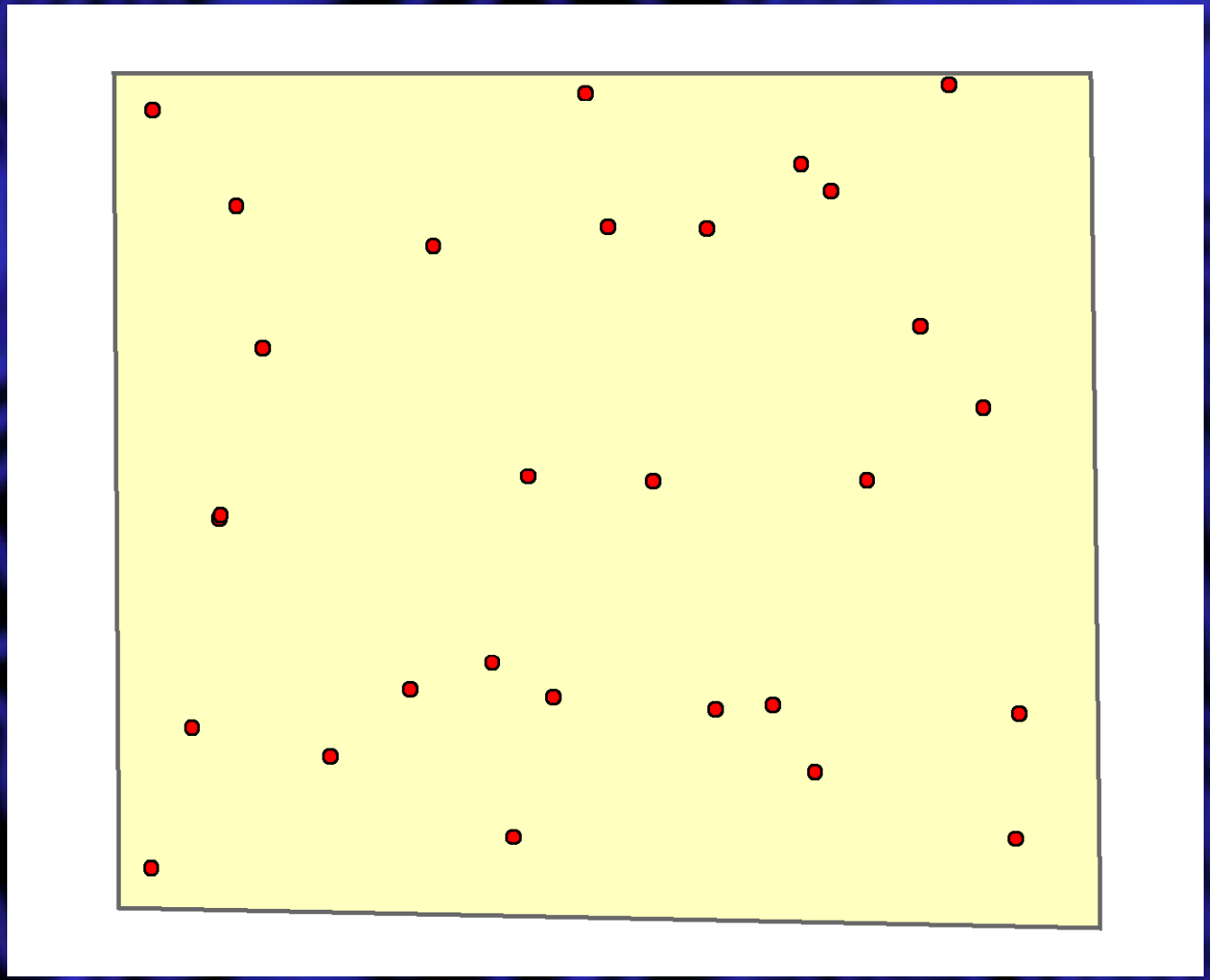
Points collected in WGS84

Transformed into NAD27 (Pathfinder Office)

No detectable offset

Methods

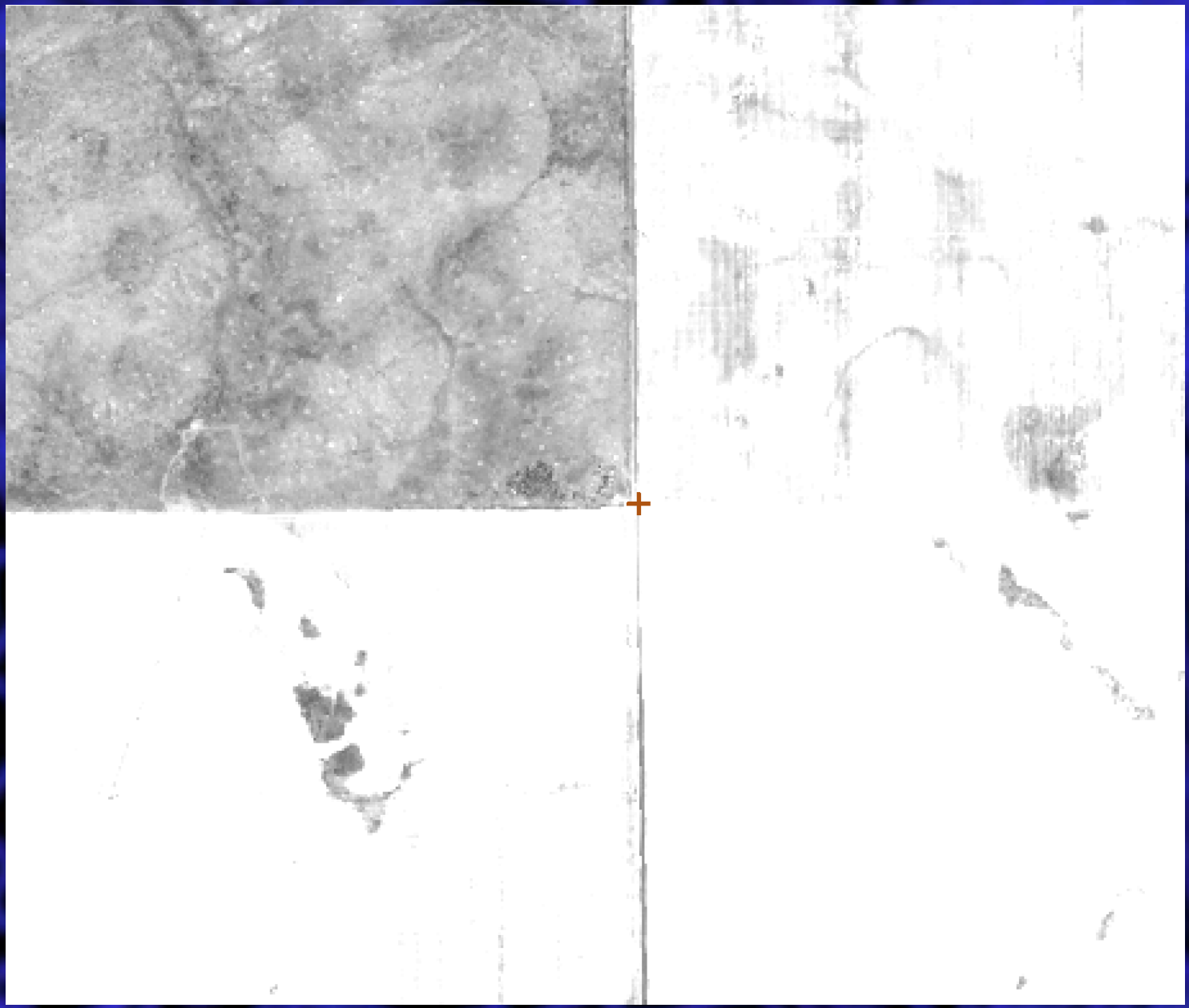
Distribution of GCPs within Big Desert



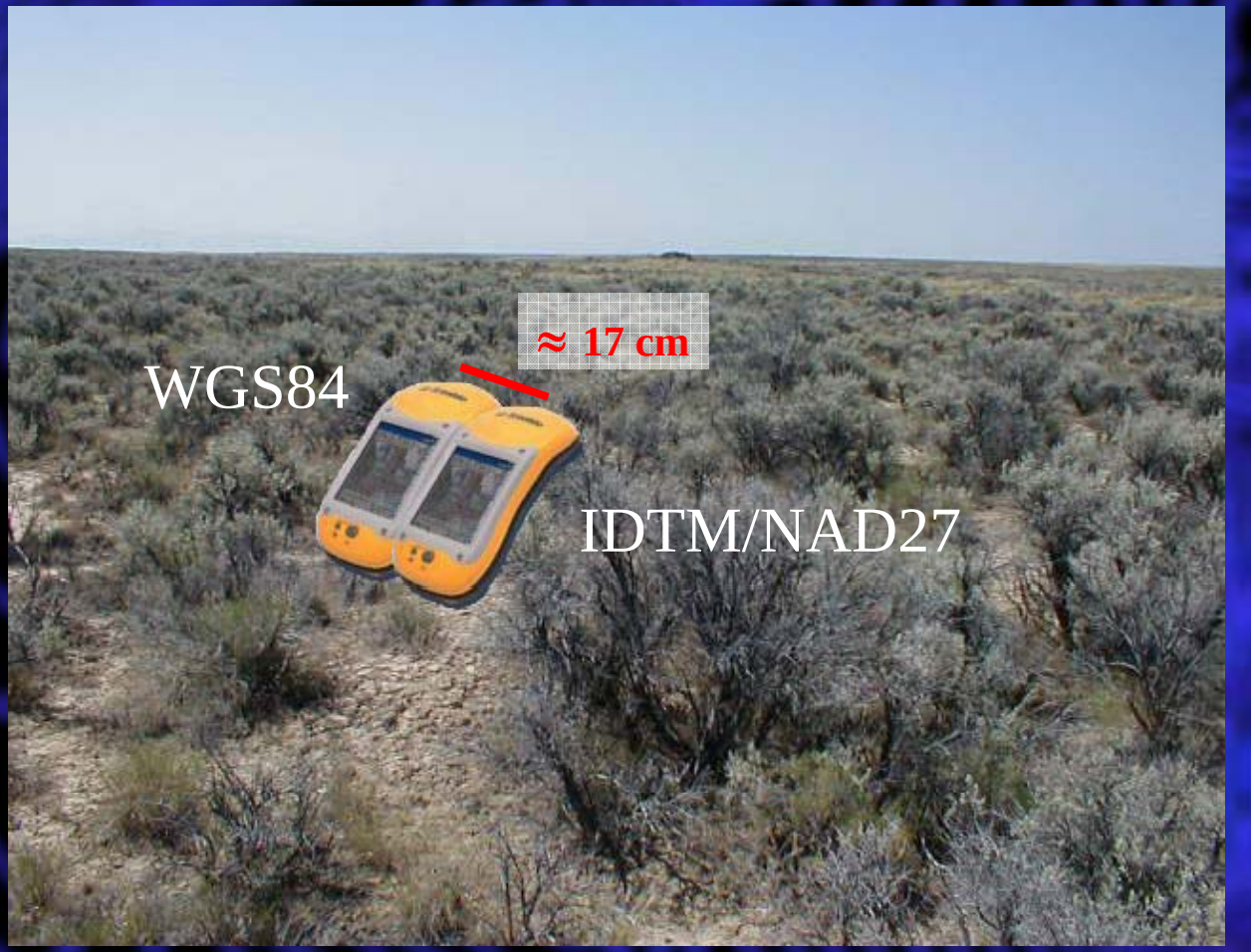
Methods

Methods

Methods



Methods



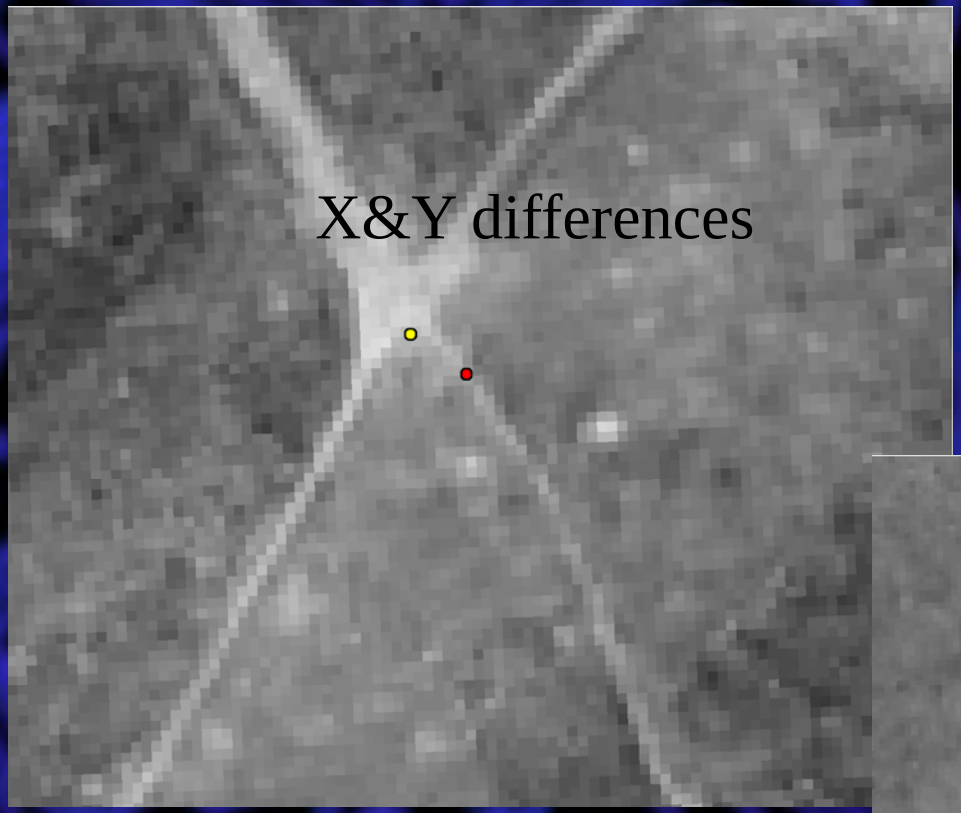
Two GeoXTs with ArcPad 6.0.2—One collected native (WGS84) the other collected in IDTM (NAD27)

Analysis

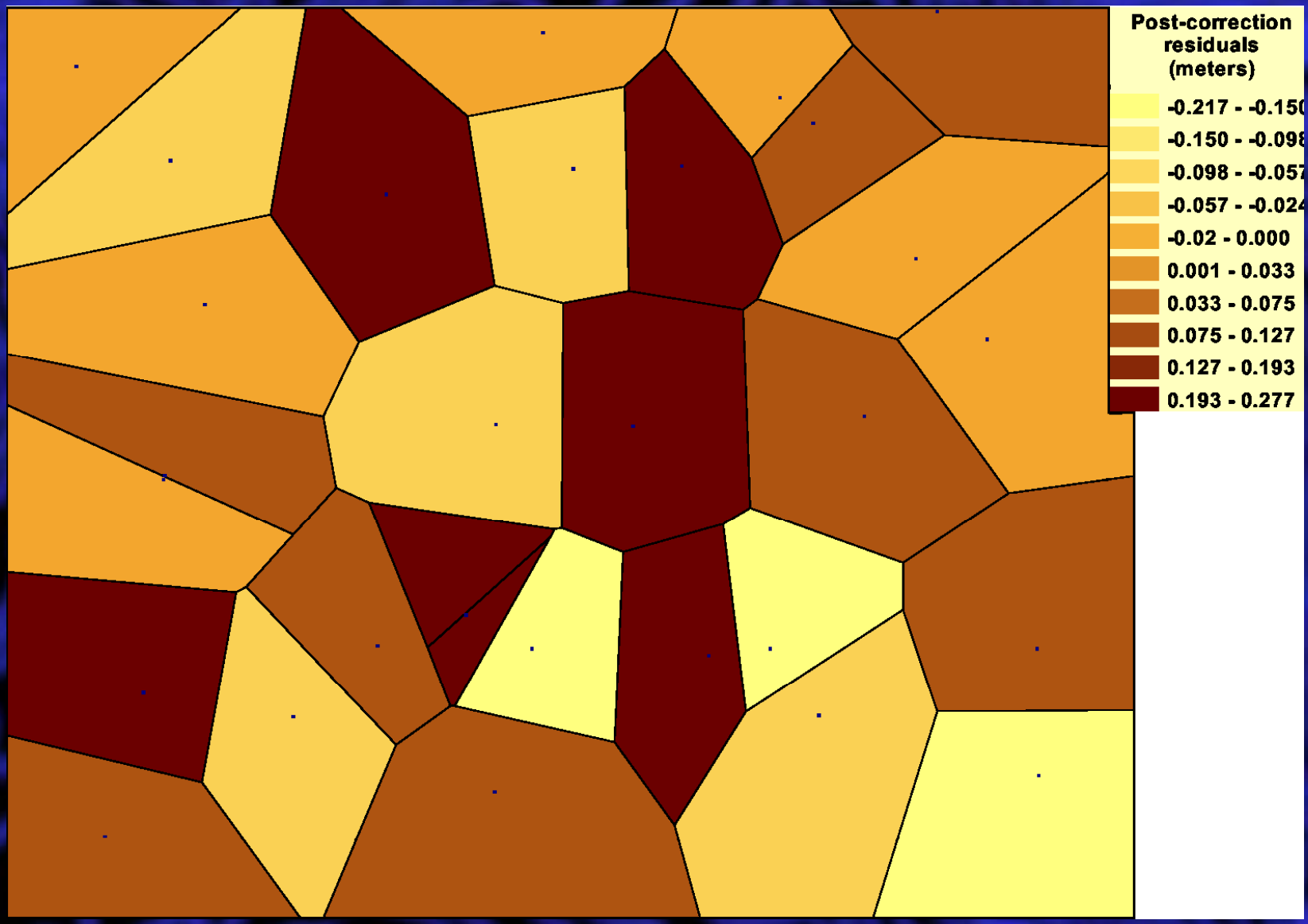
Pre-analysis steps:

- All GCPs were post-process differentially corrected
- WGS84 GCPs transformed with Pathfinder Office (NAD27)
- X and Y differences determined between datasets

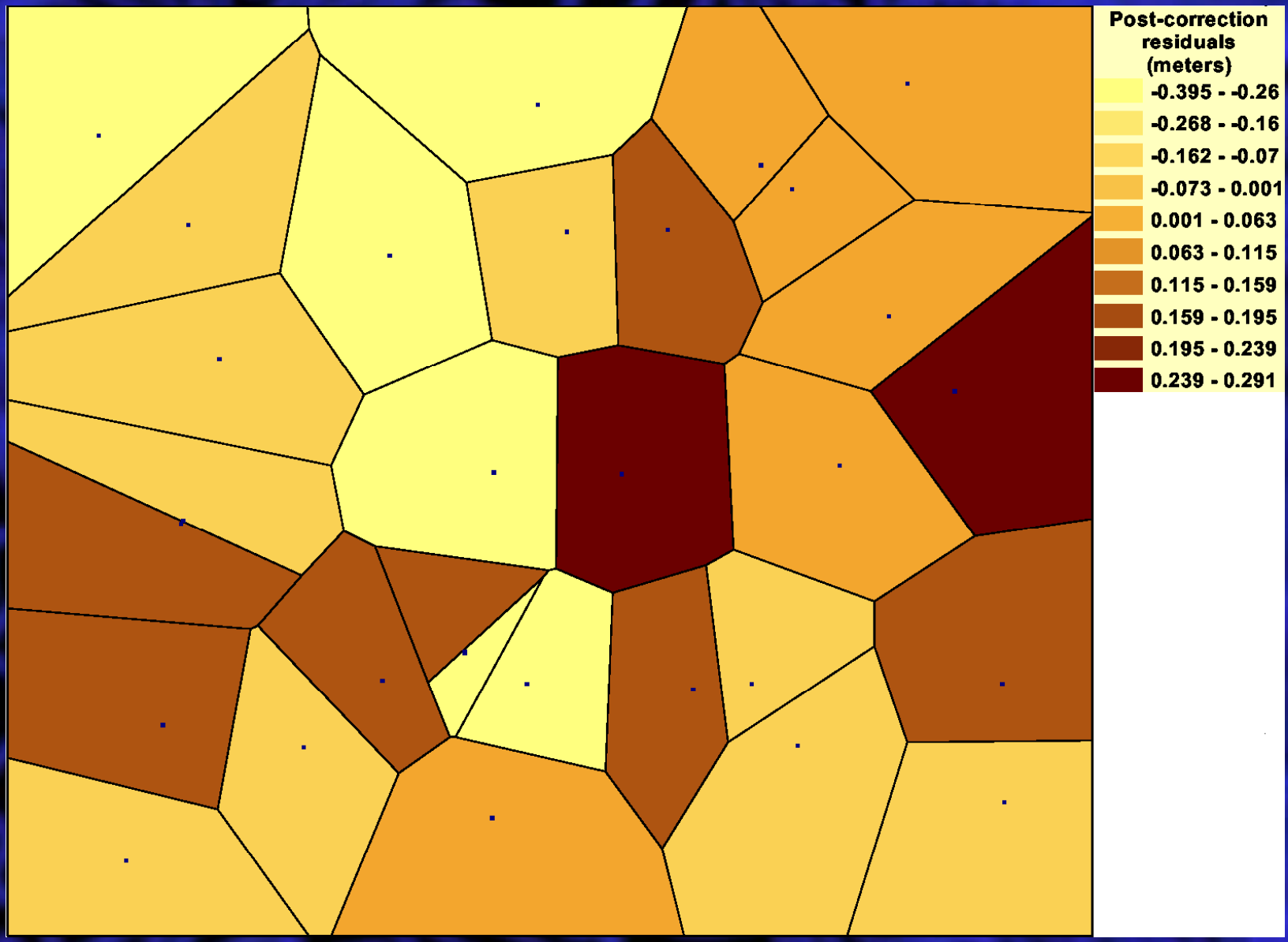
Results



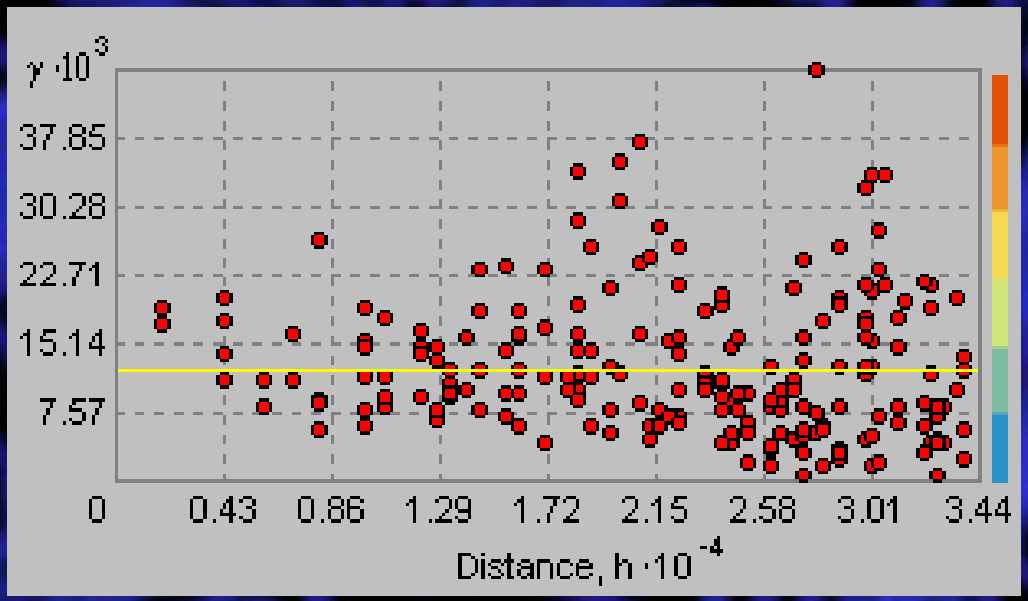
Analysis


Post-correction residuals (meters)
-0.217 - -0.150
-0.150 - -0.098
-0.098 - -0.057
-0.057 - -0.024
-0.02 - 0.000
0.001 - 0.033
0.033 - 0.075
0.075 - 0.127
0.127 - 0.193
0.193 - 0.277

Analysis

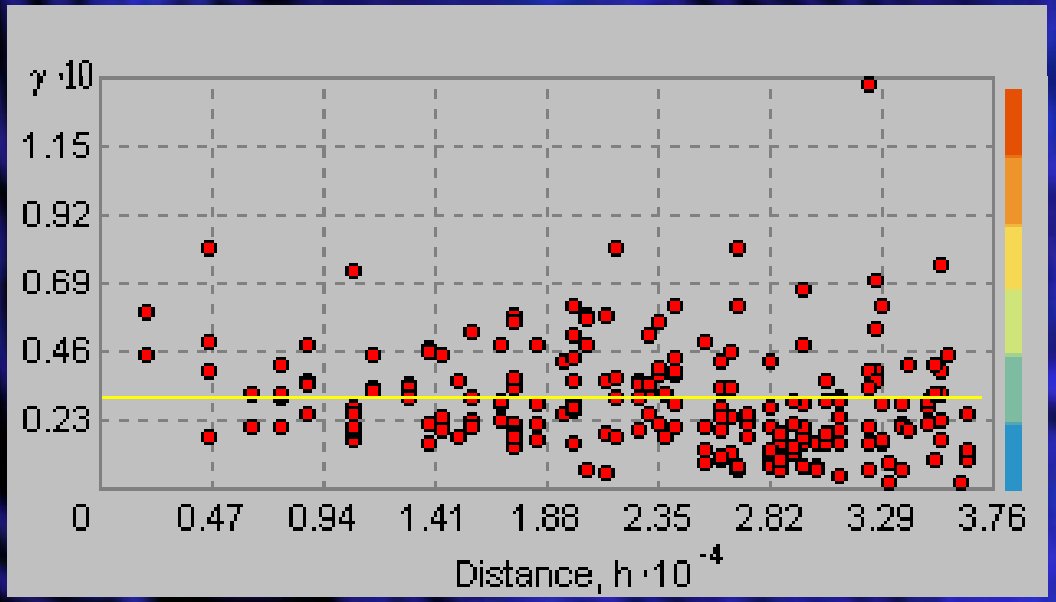

Post-correction residuals (meters)
-0.395 - -0.26
-0.268 - -0.16
-0.162 - -0.07
-0.073 - 0.001
0.001 - 0.063
0.063 - 0.115
0.115 - 0.159
0.159 - 0.195
0.195 - 0.239
0.239 - 0.291

Analysis



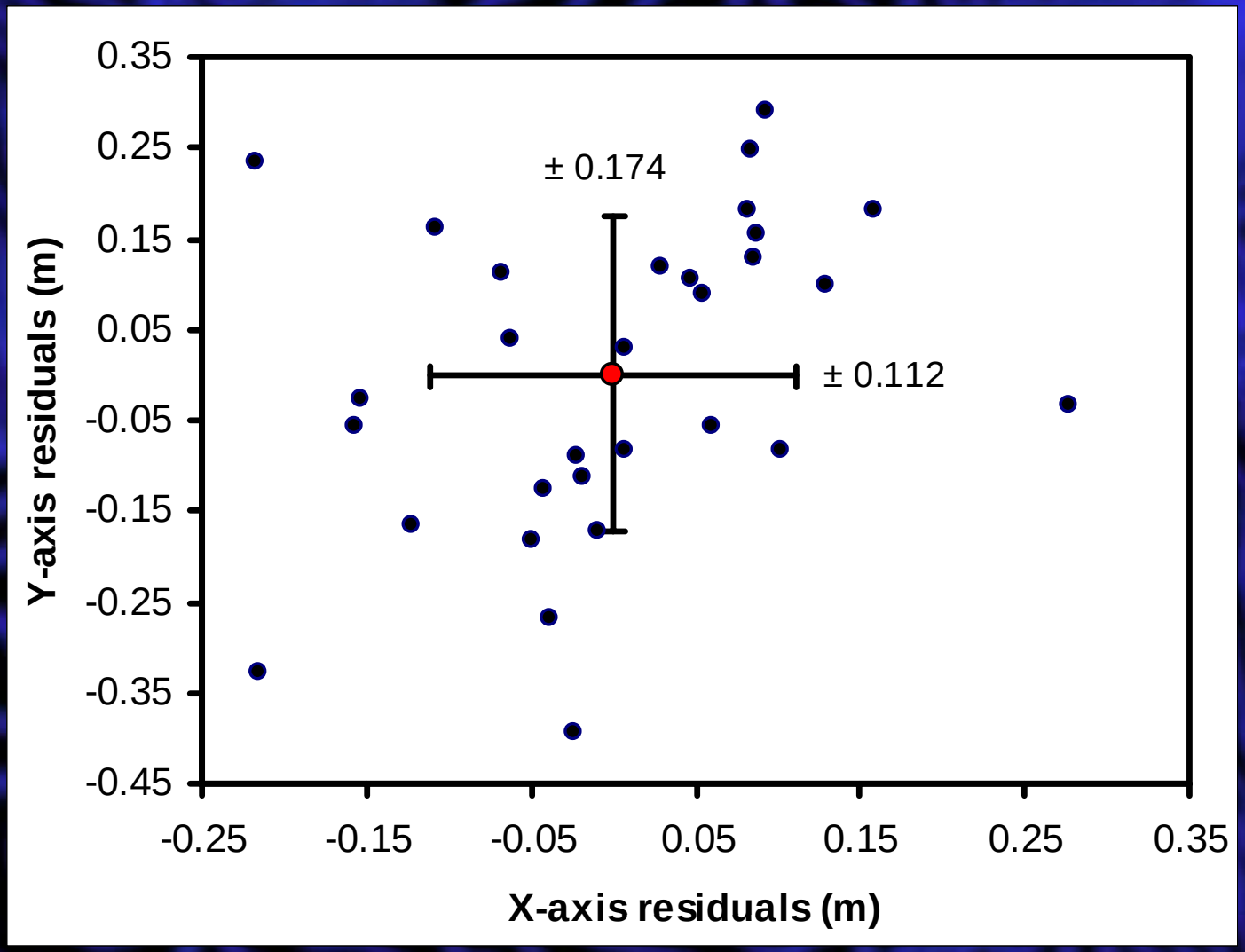
X residual variogram

Y residual variogram

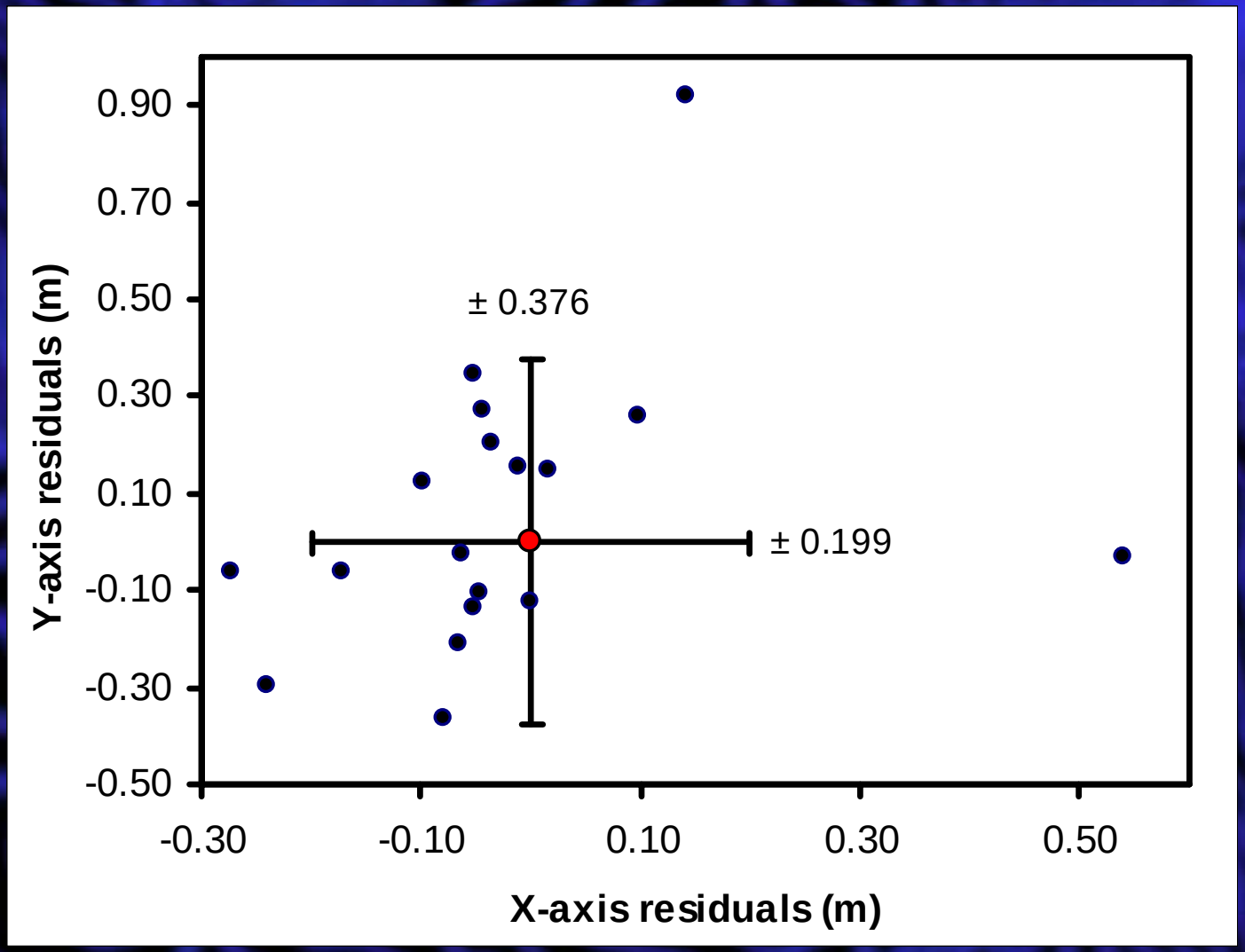


Results

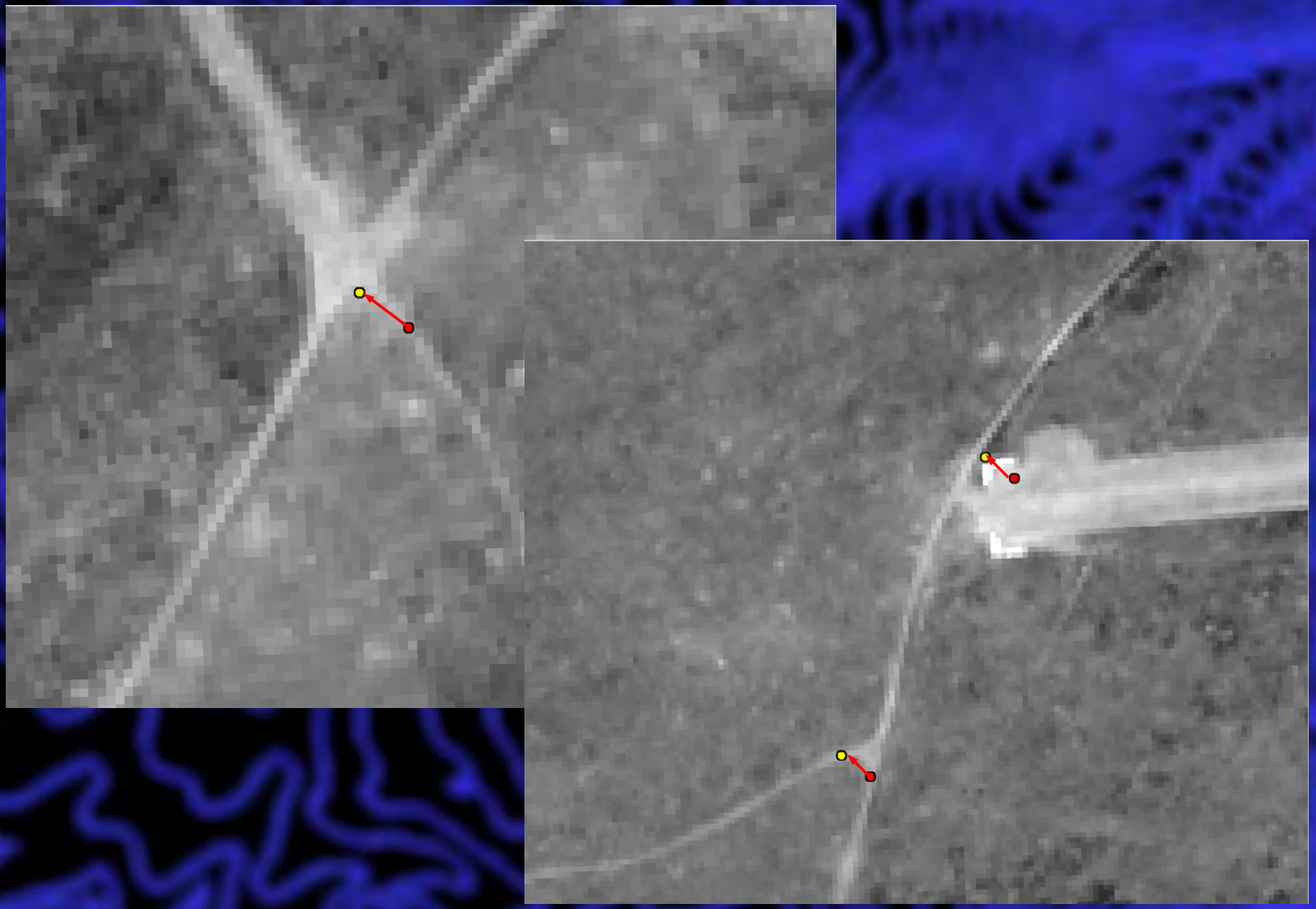
Results


0.35
0.25
0.15
0.05
-0.05
-0.15
-0.25
-0.35
-0.45
± 0.174
± 0.112
Y-axis residuals (m)
-0.25
-0.15
-0.05
0.05
0.15
0.25
0.35
X-axis residuals (m)

Results


0.90
0.70
0.50
0.30
0.10
-0.10
-0.30
-0.50
Y-axis residuals (m)
± 0.376
± 0.199
-0.30
-0.10
0.10
0.30
0.50
X-axis residuals (m)

Results



Discussion/Conclusions

- Check transformations and projections
- Collect GPS data in native WGS84
- Use verified software for datum transformation
- Collect GCPs in study areas to compare transformations
- Accuracy/imagery co-registration

Questions

- Questions
- Comments
- Suggestions

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