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# **Watershed Sciences 4930 & 6920**

## **GEOGRAPHIC INFORMATION SYSTEMS**

BLIMP LAB

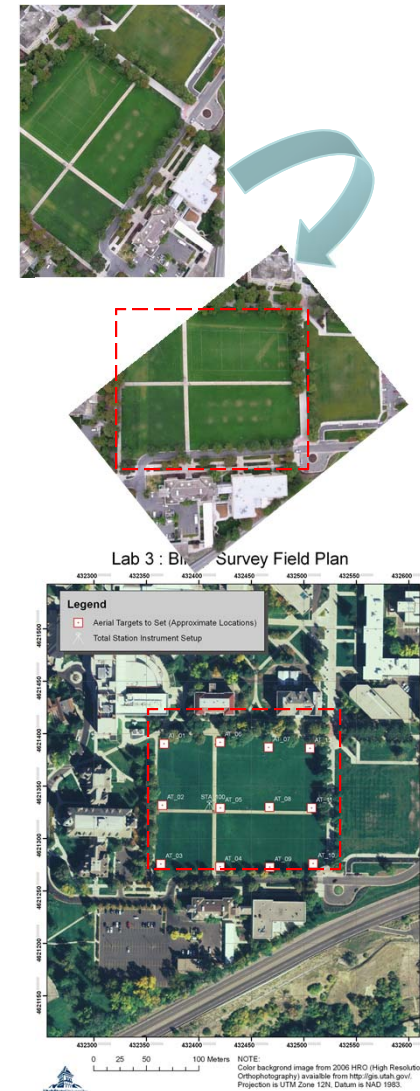
### **GEOREFERENCING BLIMP IMAGERY**

Joe Wheaton

# TASK 1 – SOME COMMON PROBLEMS

*Georeference a blimp image with full coverage of quad to 2006 HRO*

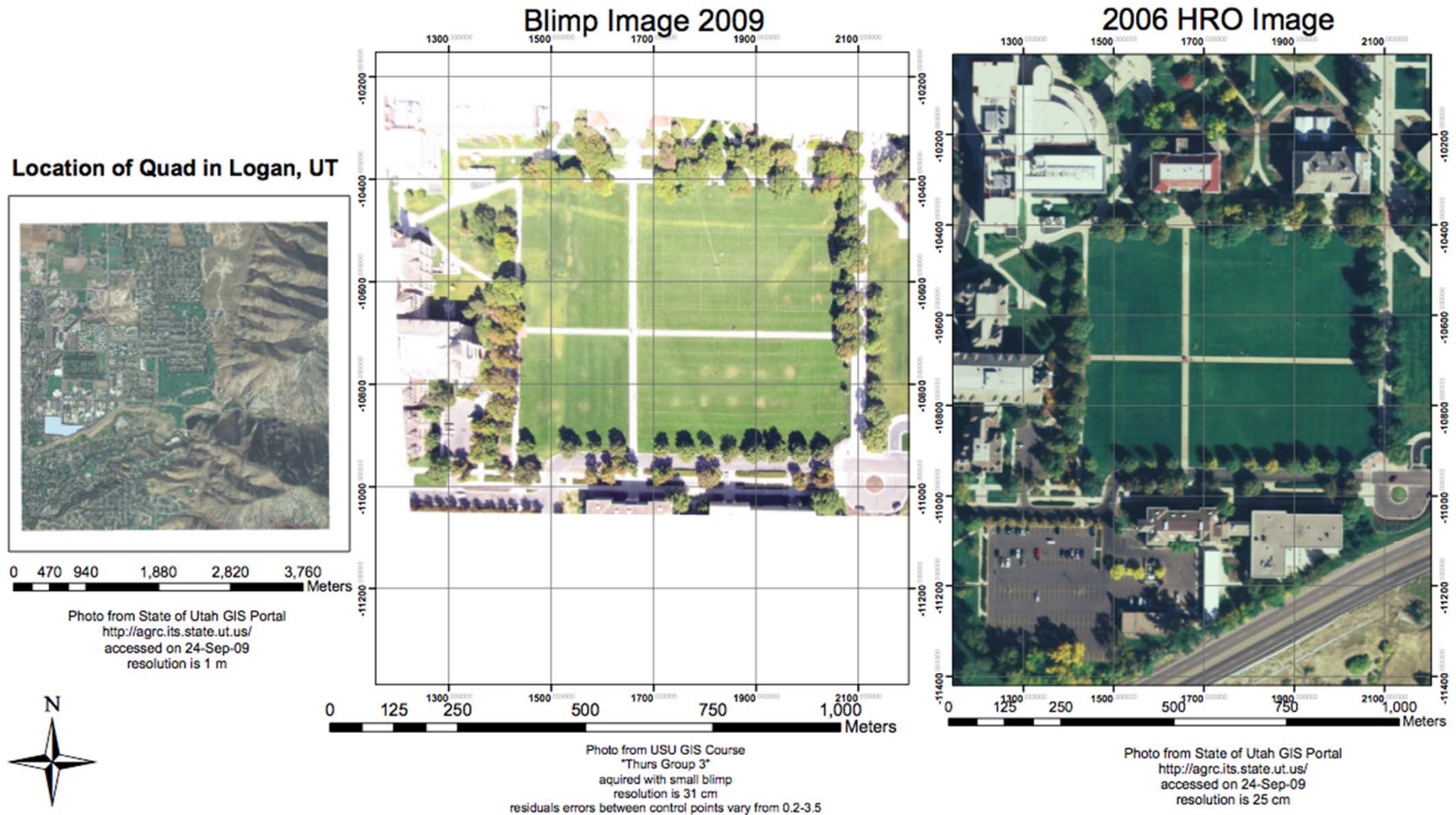
- Finding a photo with full coverage of quad
- Downloading the wrong size image from Picasa and getting a coarser resolution than 2006 HRO
- Not enough context text! Err on side of verbosity...
- Distortion.... Why does it occur and how can you improve it?



# TASK 1 – Example 1 of 3

## Georeferenced Images of the USU Quad

Lab 3, task 1  
24-Sept-09





# TASK 1 - Example 2 of 3

## Georeferencing a Blimp Photo of the USU quad using the 2006 HRO Imagery



a) the Georeferenced Blimp Photo



b) the 2006 High Resolution (1-foot) Orthorectified Aerial Imagery

Spatial Reference: Datum: NAD 1983  
Projection: UTM; Zone: 12N (in meters)  
Image Source: Blimp: Acquired by USU students of WATS 4930/6920 Thursday lab. group  
2006 HRO: Utah GIS portal (<http://gis.utah.gov/aerial>)  
Estimated Error of Blimp rectification: Total RMSE of 0.16295 with 20 points  
Transformation: 3rd order polynomial

0 3 6 12 18 24 Meters



# TASK 1 - Example 3 of 3

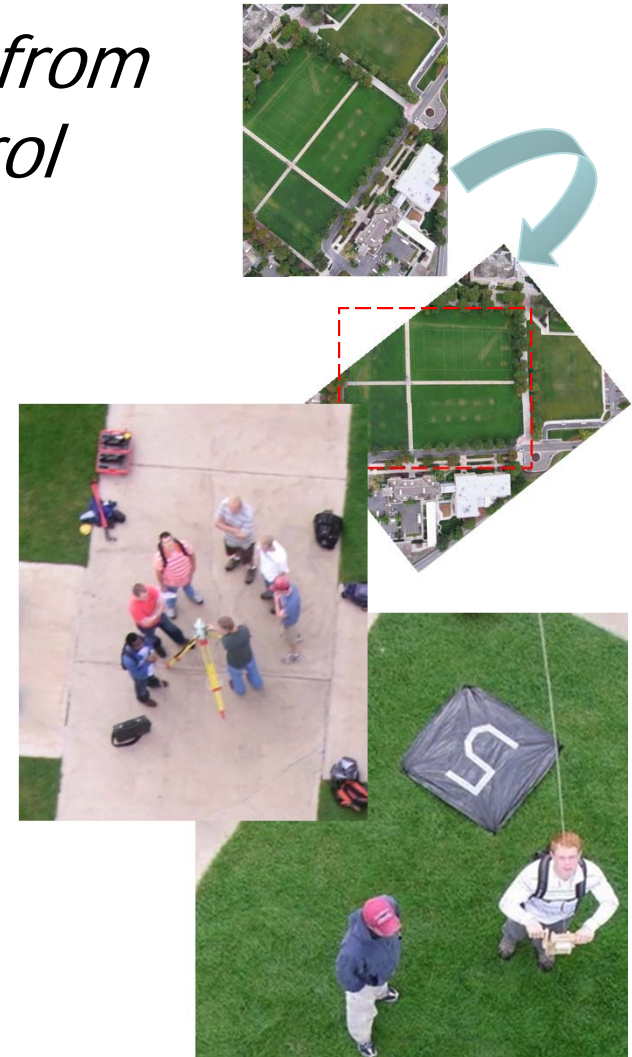




# TASK 2 – SOME COMMON PROBLEMS

*Georeference same blimp image from Task 1 using total station control collected from garbage bags*

- Choosing an image that although it had full coverage of quad was too oblique
- Didn't report rectification errors (clearly enough or at all)
- No comment on qualitative goodness of fit
- No grid shown... Not recognizing assumed coordinate system
- No explanation to Facilities...

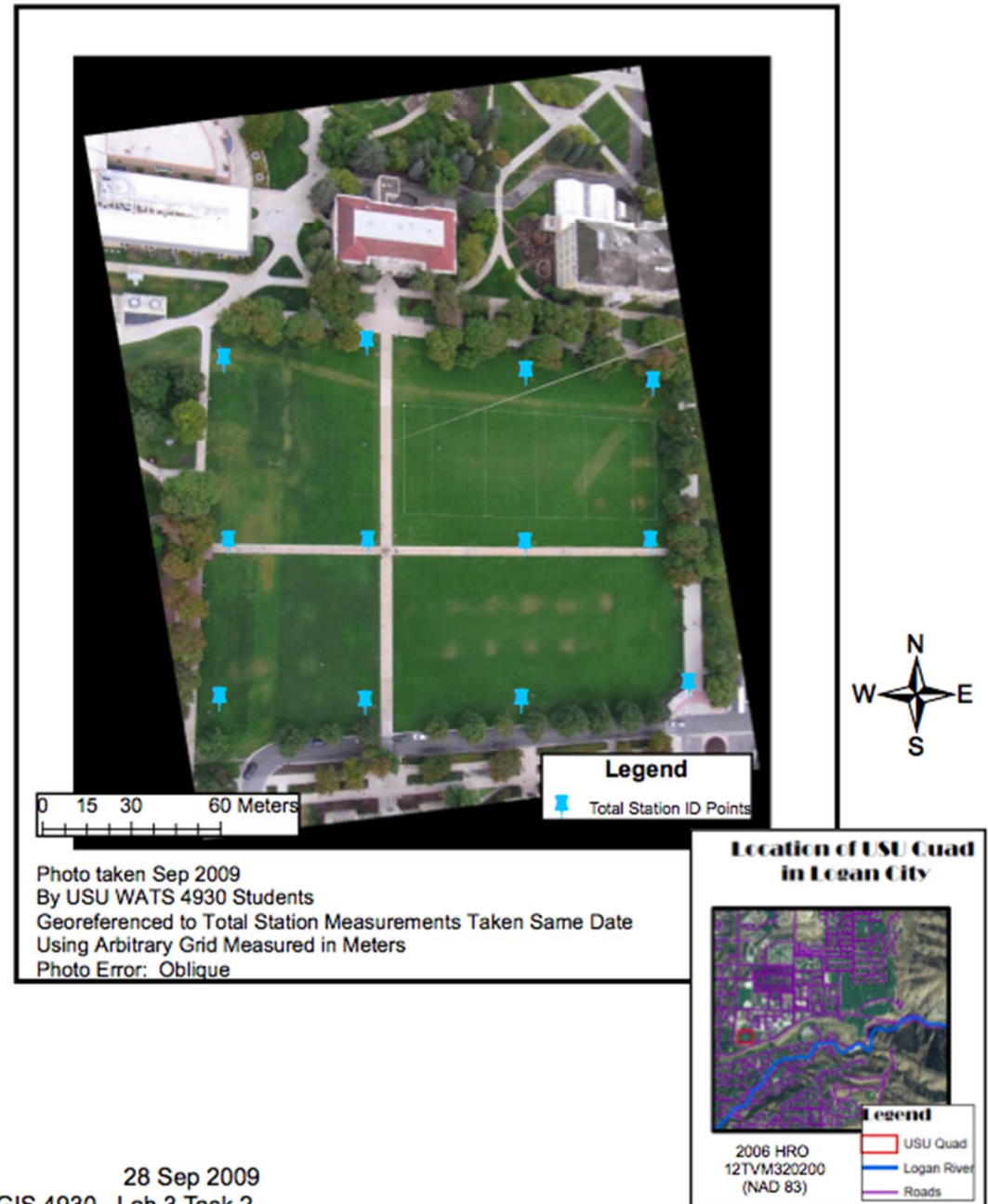


# TASK 2

Questions:

- Is this done correctly?
- Why is background black?
- Does it need a grid to be correct?

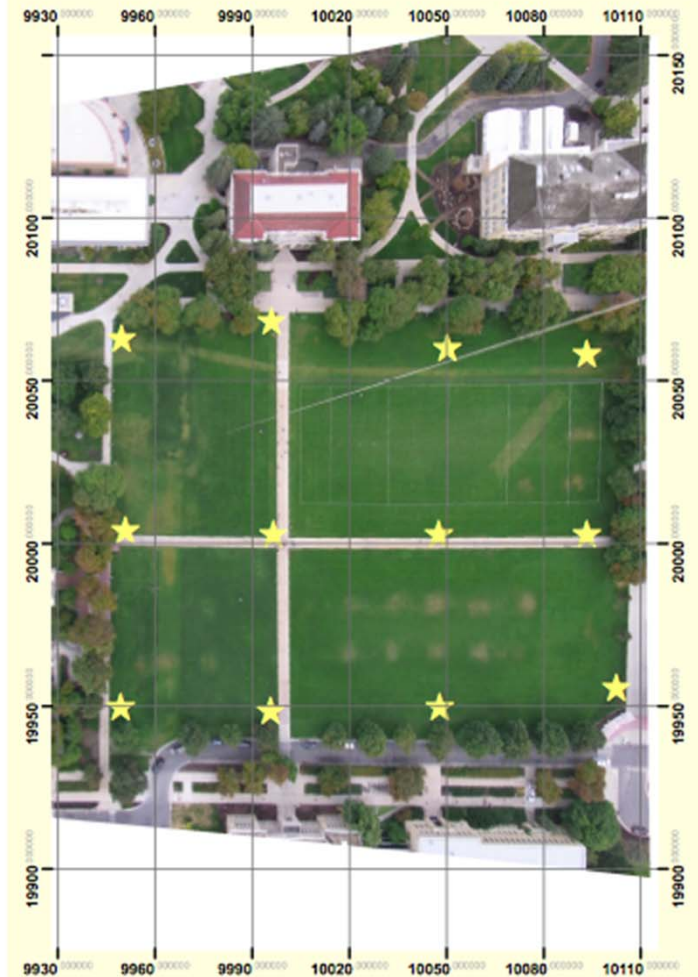
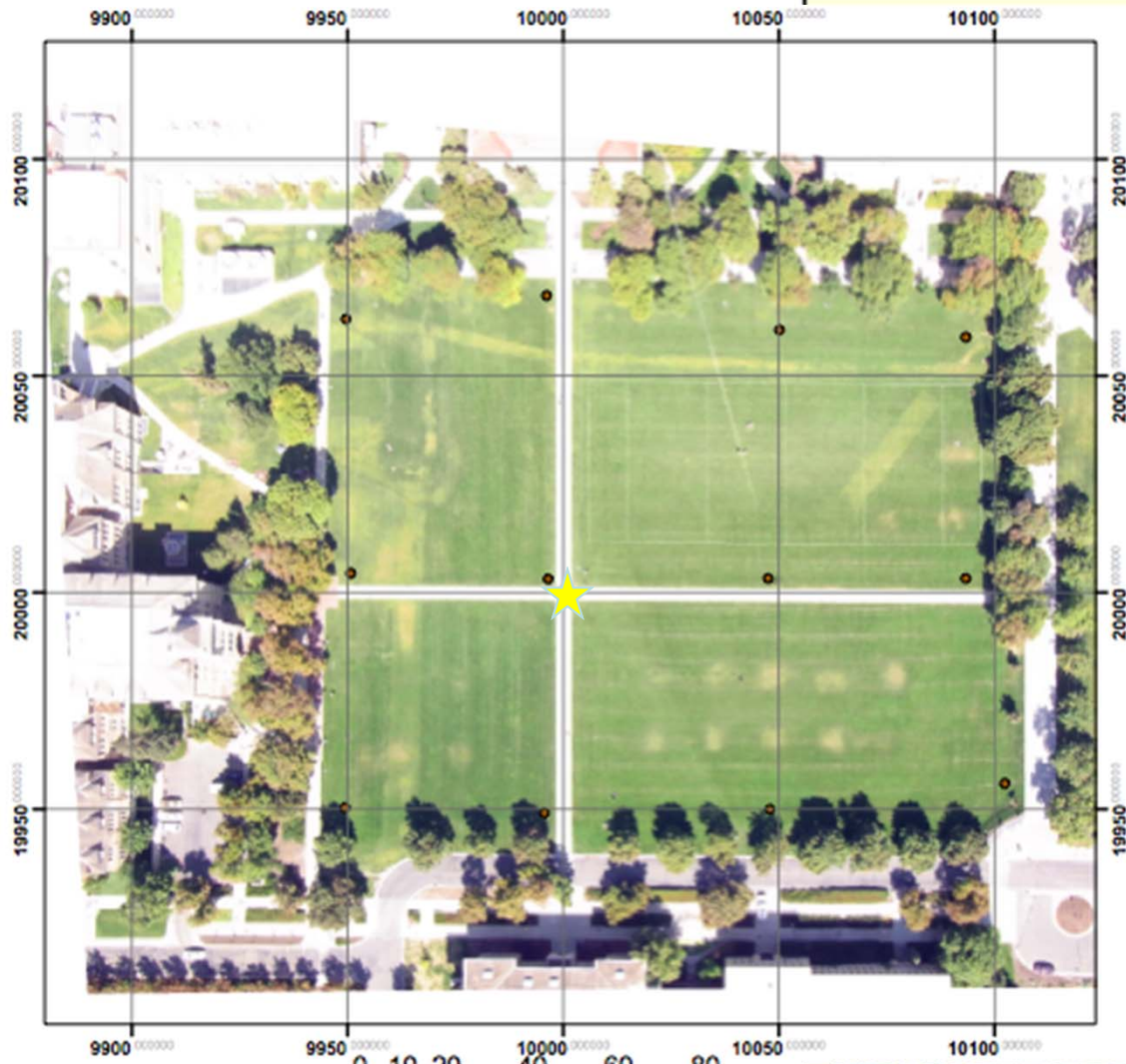
## Blimp Aerial Photo USU Quad





# TASK 2

Utah State University



Georeferenced Image

Aerial image taken from Blimp 9/15/2009  
Projection: NAD 1983 UTM Zone 12N  
Information received via total station survey  
7.5 cm Resolution  
RMS error: 1 cm

Lab 3, task 2  
October 1, 2009

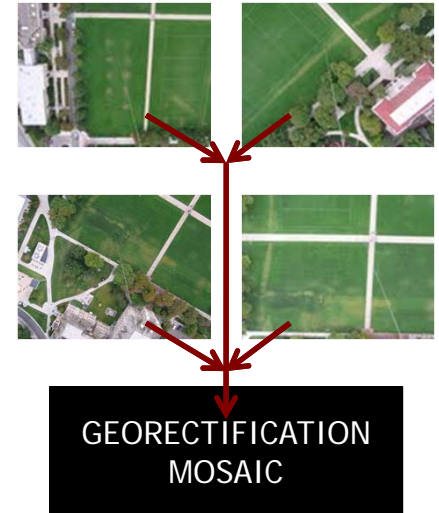
0 25 50 100 Meters



# TASK 3 – SOME COMMON PROBLEMS

*Georeference 2 to 6 higher resolution blimp images using total station control, which collectively cover quad*

- Finding the 'right' images
- 'I georeferenced each image correctly but they don't line up' – GEOMETRY!!!!
  - What could I do to fix that?
- Confusion over mosaicing...



# TASK 3

- How could error be estimated and reported?

## Garbage Bag Targets Blimp Photos Overlay 2009



LAB 3 TSK 2  
10-1-09

Data Source:  
2009 Blimp Georeferenced image  
2009 Total Station Data



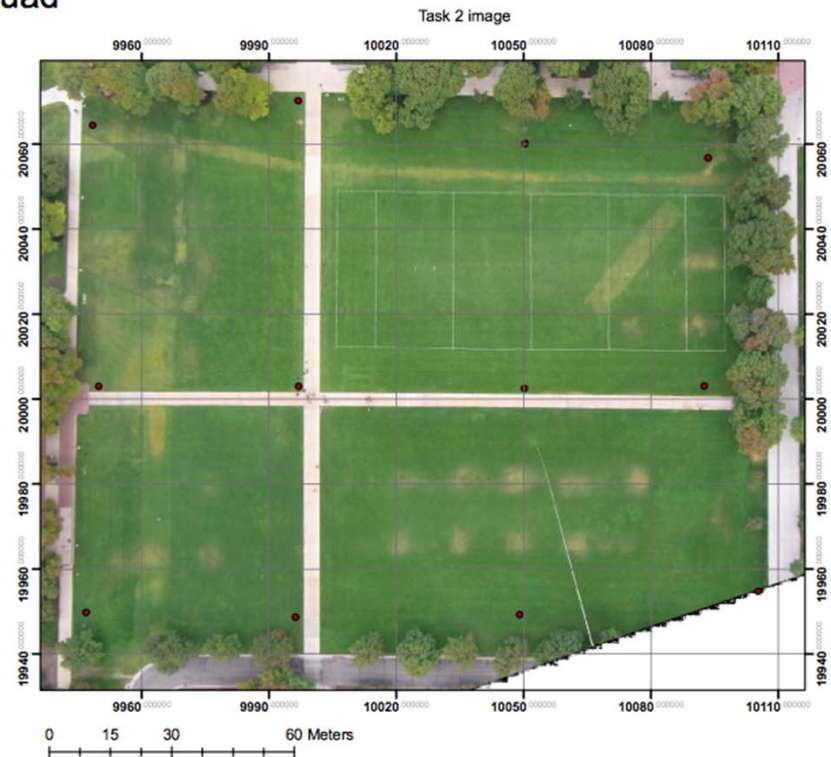
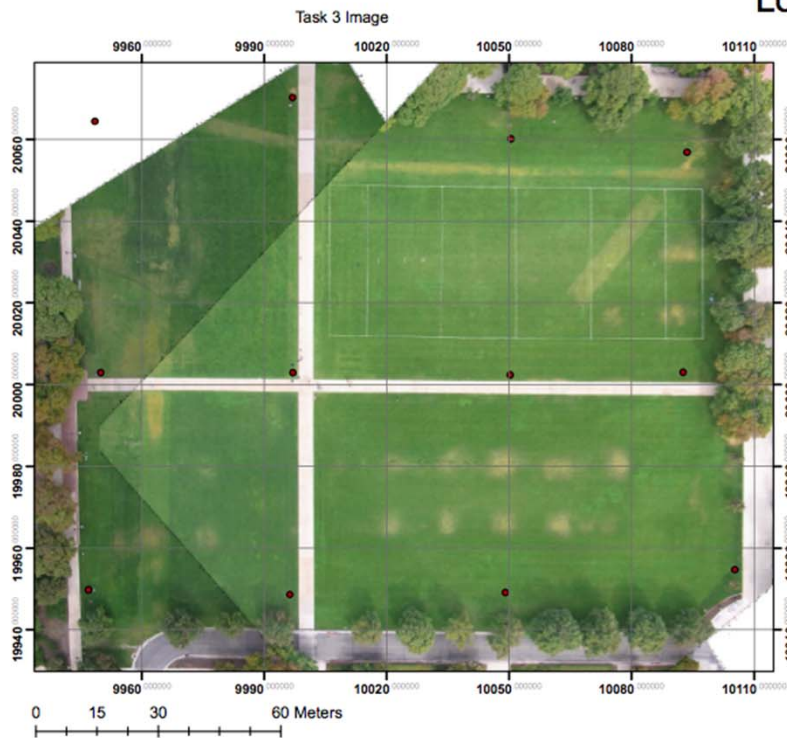
Resolution:  
Low Resolution Camera

Estimated Errors:  
There may have been  
some operator error  
when placing the prism  
to take the measurement.



# TASK 3 – PART II

## Logan, UT: Quad



### Task 3 Image

Georeferenced 2 photos using the control points found using total station and control points marked on the ground by garbage bags with numbers on them. Resolution of 2 photos 8 cm

### Task 2 Image

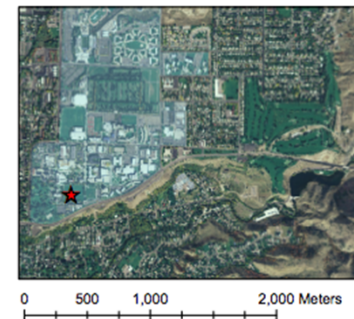
Georeferenced using 12 total stations for control on points marked on the ground by garbage bags with numbers on them. Applied a 2nd order transformation which gave a total RMS error of 0.26277. Resolution 8.2 cm

Projections are UTM Zone 12N, Datum is NAD 1983 (meters)

Inset: HRO Image 2006  
NAD 1983 UTM, Zone 12 N (meters)  
Transverse Mercator  
Resolution 25 cm  
Utah GIS Portal (<http://gis.utah.gov/sgrid>)

### Legend

- ★ quad
- usucampus

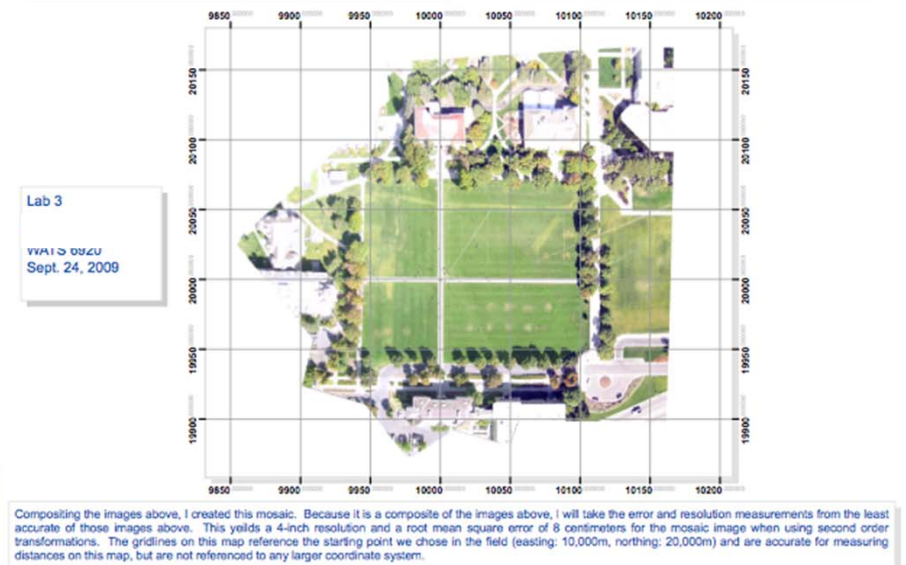
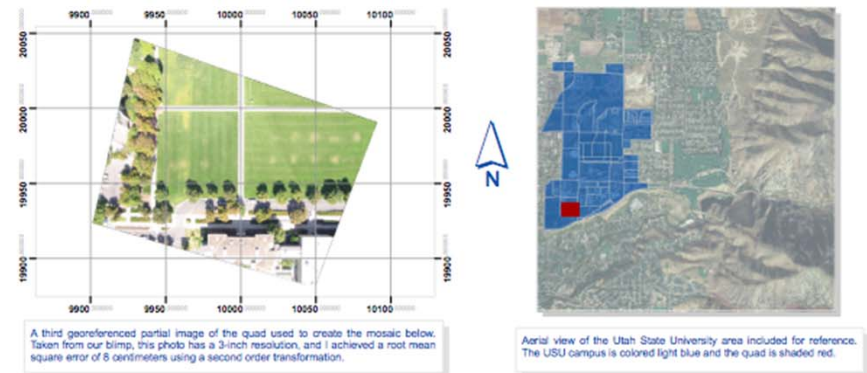
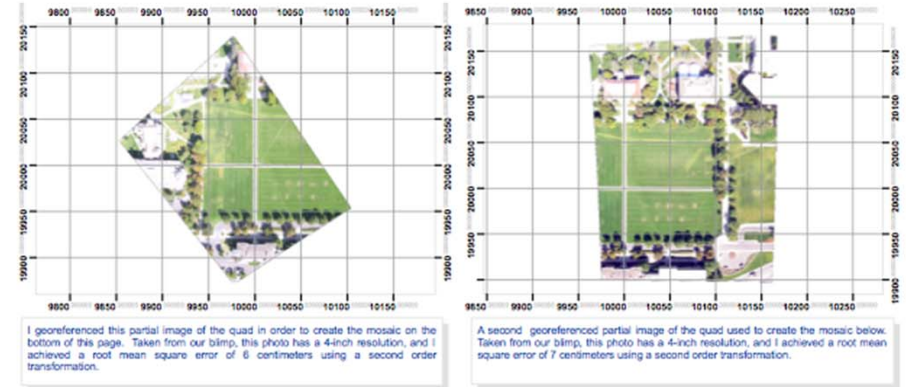


Blimp photos taken on 9/15/2009 using a blimp flown over the quad for class WATS 4930. Tues group 7-8  
Camera used was RICOH model CX1, took a picture every 3 seconds.

# RICH CONTEXT

- This student chose to show the steps leading up to construction of mosaic

## Using Georeferenced Images to Create a Mosaic Image





# MOSAIC (BY OVERLAY OR COMMAND)

- Yours' isn't as easy as the textbook help example

