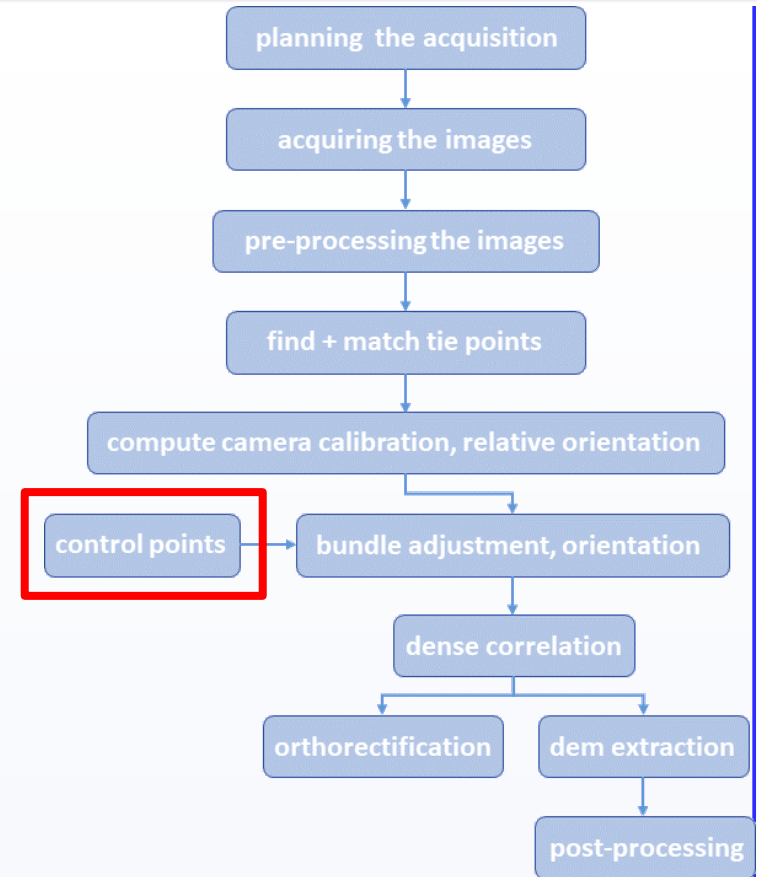


EGM702 – Photogrammetry and Advanced Image Analysis

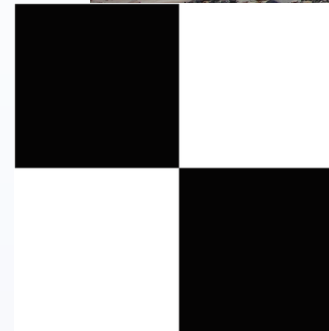
Week 1, Part 4: Selecting control points

Basic photogrammetry workflow

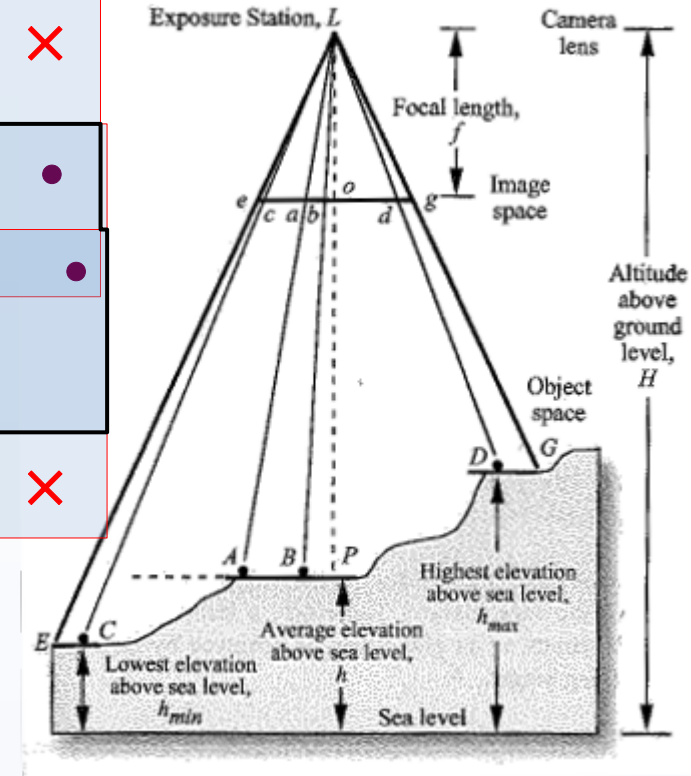
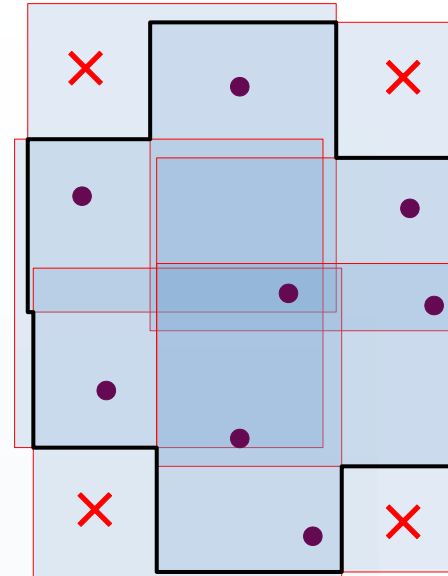
- Everything covered in Part 3 can be done in relative geometry
- To relate relative geometry to real world, need **control points**:
 - Points whose exact* location is known



- Used for:
 - Transforming relative to absolute coordinates
 - Estimating scale
- Determine accuracy of final scene
- Best case (most accurate):
 - Artificial targets with GPS/GNSS survey
- Less-good case:
 - Natural points, found using to maps, existing orthophotos, DEMs
- Remember: **you have to see them in the images!**

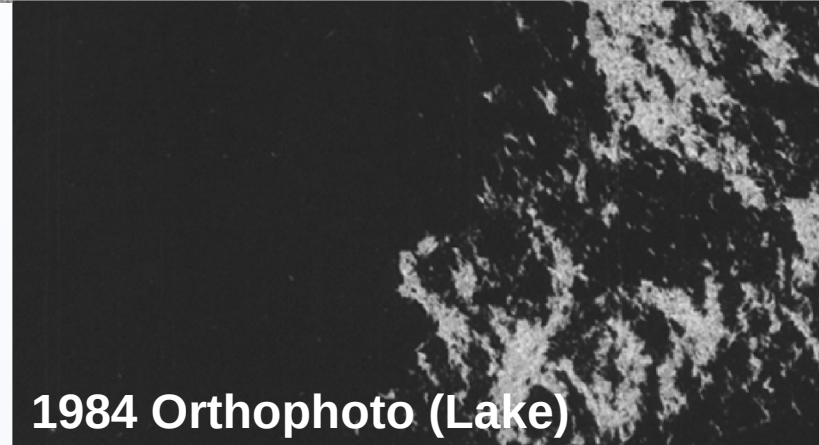
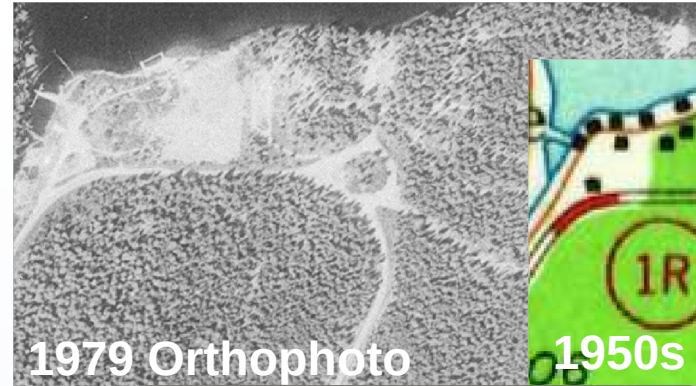


- Typically, 5-10 GCPs are sufficient
- Well-distributed throughout survey area
 - Both x, y and z
- Typically need more with more varied terrain



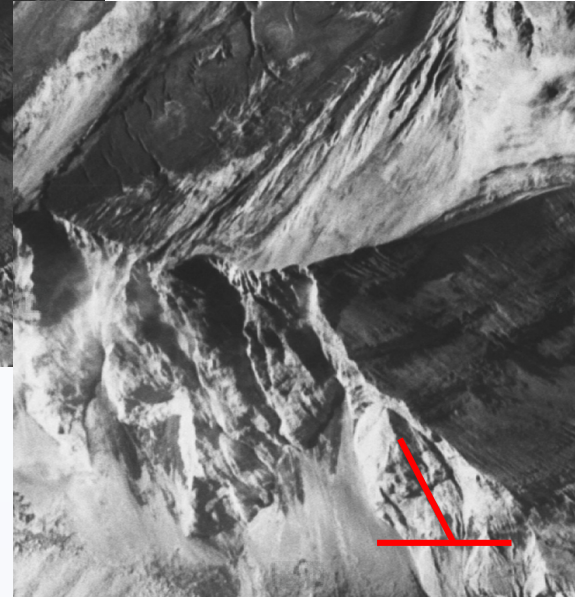
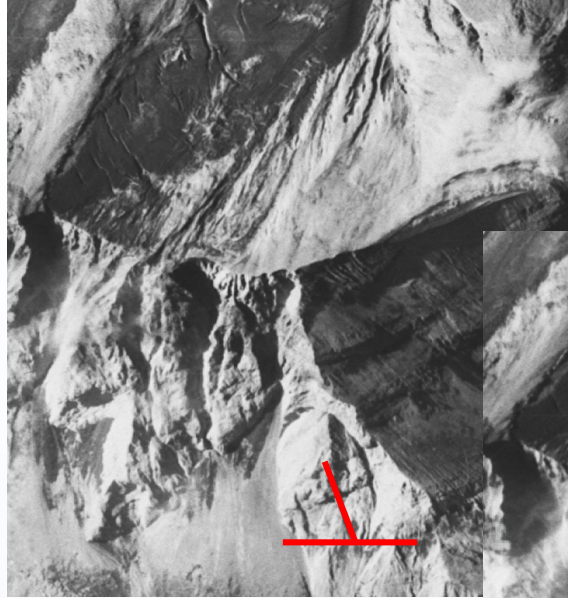
Strategies (less-good case)

- Look for easy-to-identify, **unique** features:
 - Road intersections
 - Bridges
 - Buildings
 - Peaks/crests
- **Don't** assume features are static (check dates)
- Use the most accurate, best-resolution DEM available



Changing topographic shapes

- Remember: foreshortening (relief displacement) exists
 - Tall features, such as peaks, will look different in different images
 - Depends on height, location in image
- May have to use trial-and-error



- (Ground) Control Points help fix our images to the real-world
- Typically need at least 5 points:
 - each point visible in at least 2 images
 - well-distributed in x , y , and z
- Finding ‘natural’ control points in images can be difficult (so bring your own if you can)