Glacier Mass Balance Studies

- ASTER data being used to predict response of glacier systems to climate change
- Glacier boundary outlines (using GLIMSView) combined w/ ASTER-derived DEM to get hypsography
- Hypsography plus measurements from benchmark glacier used to define mass balance as function of ELA for entire glacier system

- Editing has been performed to remove artifacts and interpolate over failed regions.
- DEM used to orthorectify image bands
- False color VNIR composite draped over DEM for 3-D visualization
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• Mask DEM using ice outlines
• Compute histogram of elevations
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- Digitizing outlines w/ GLIMSView
- Exports data in format specified for ingest into GLIMS database at NSIDC
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Hypsography compared to previous field survey (Kuzmichenk, 1977)
The “Template” Method

• Field measurements of benchmark glacier used to find annual mass balance as function of accumulation area ratio (AAR)
  – This relationship is assumed to apply to all glaciers in a region sharing similar climate, terrain, etc.
• Integral of area vs. elevation curve gives AAR as function of equilibrium line altitude (ELA)
• Thus, we can get mass balance as function of ELA for any glacier, using its hypsography