

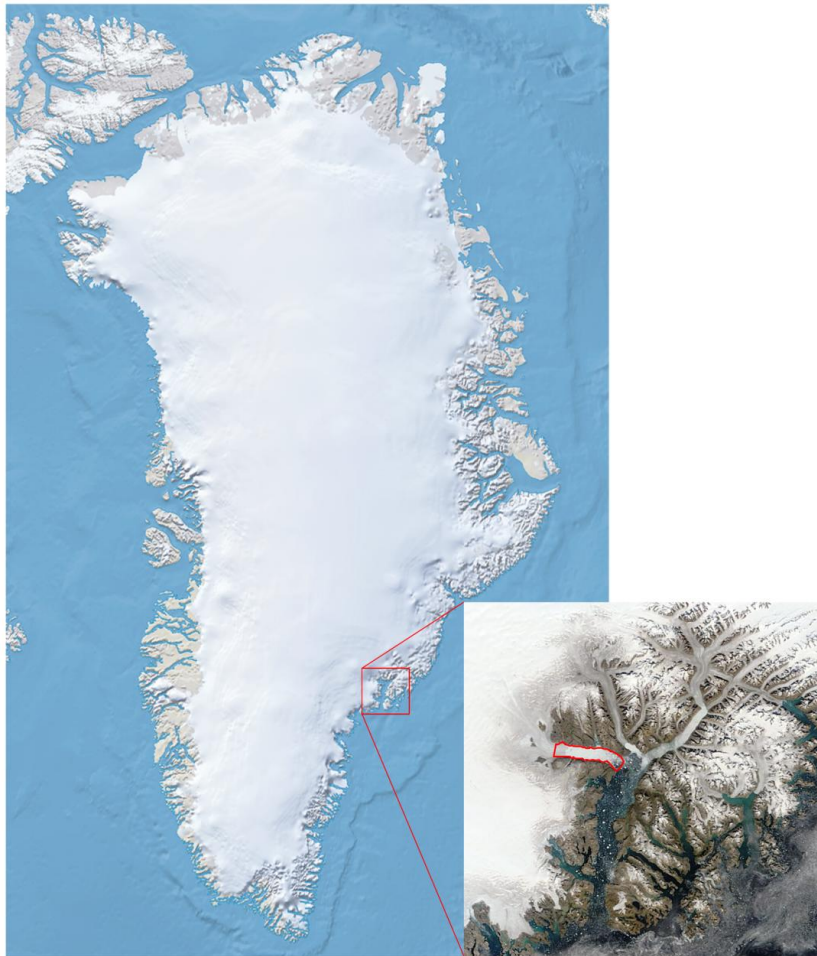


# Measuring Greenland Glacier Dynamics with Remotely Sensed Data

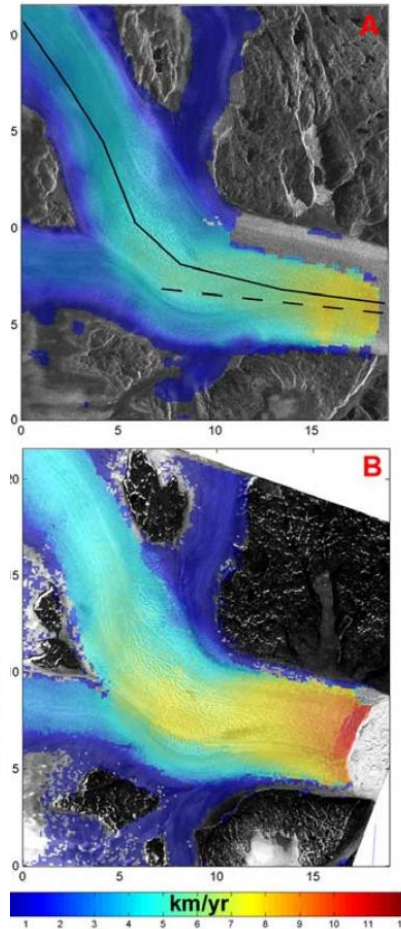
Steve Foga

University of Kansas, Geography M.A. Student

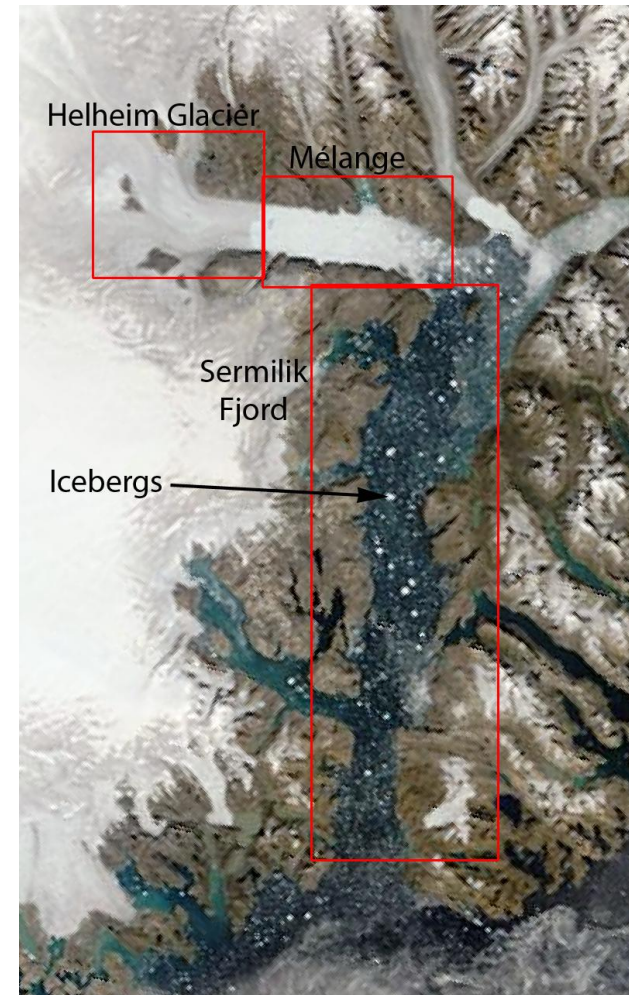
# The importance of studying glacier ice



Study area

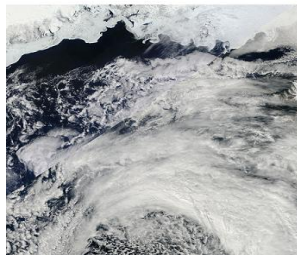
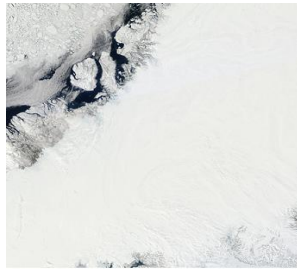


Difference in ice velocity of Helheim Glacier in 2000 [A] and 2004-5 [B]. [Howat et. al., 2005].

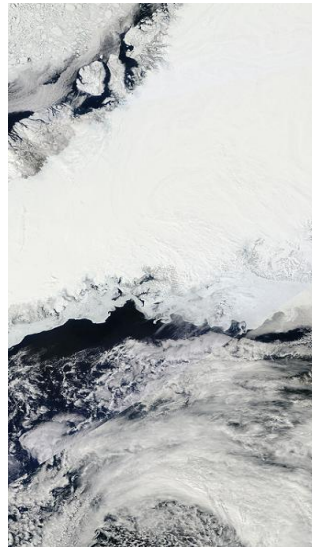


Helheim Glacier System

# GIS Workflow



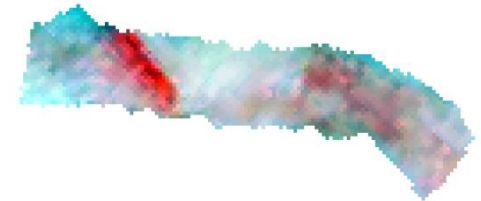
1. Download



2. Mosaic



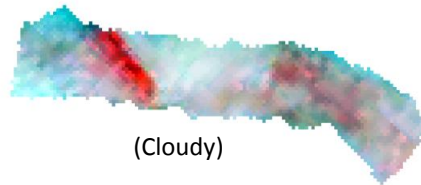
3. Project  
4. Subset (or clip)



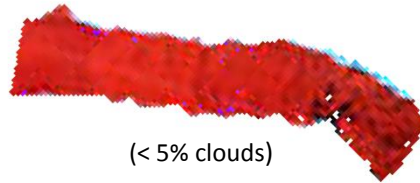
5. Repeat 1-4 for NIR



6. Perceived Brightness Transformation

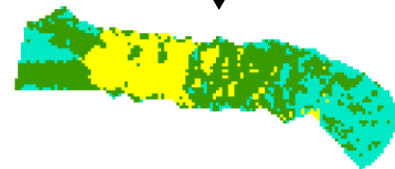


(Cloudy)

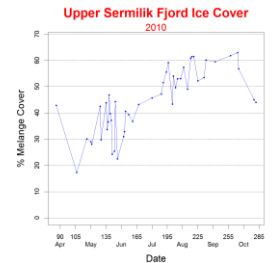
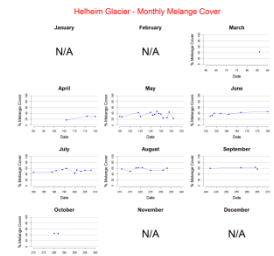


(< 5% clouds)

7. Detect Cloud Cover



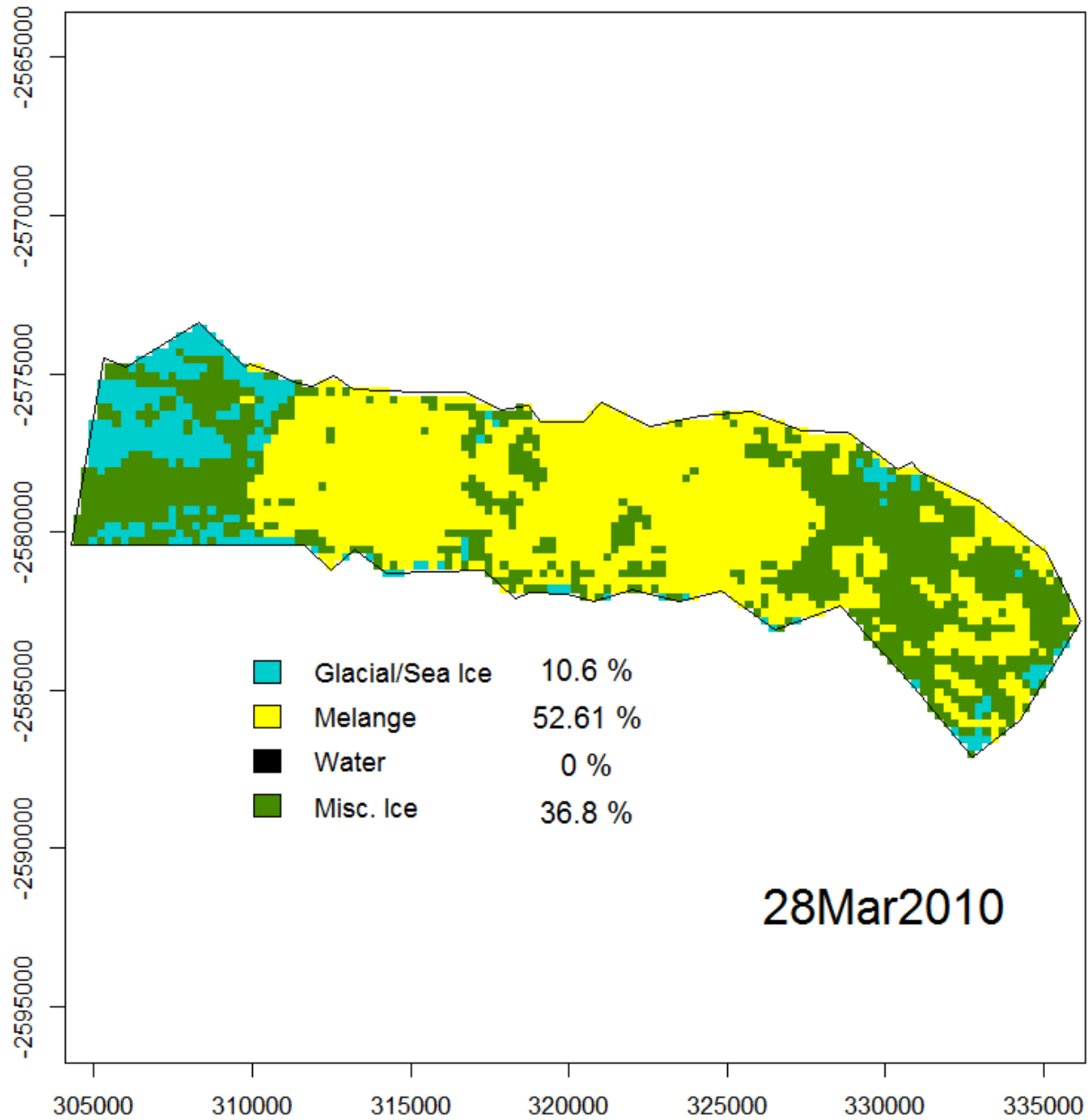
8. Classify Images



9. Compute Statistics & Output Graphics

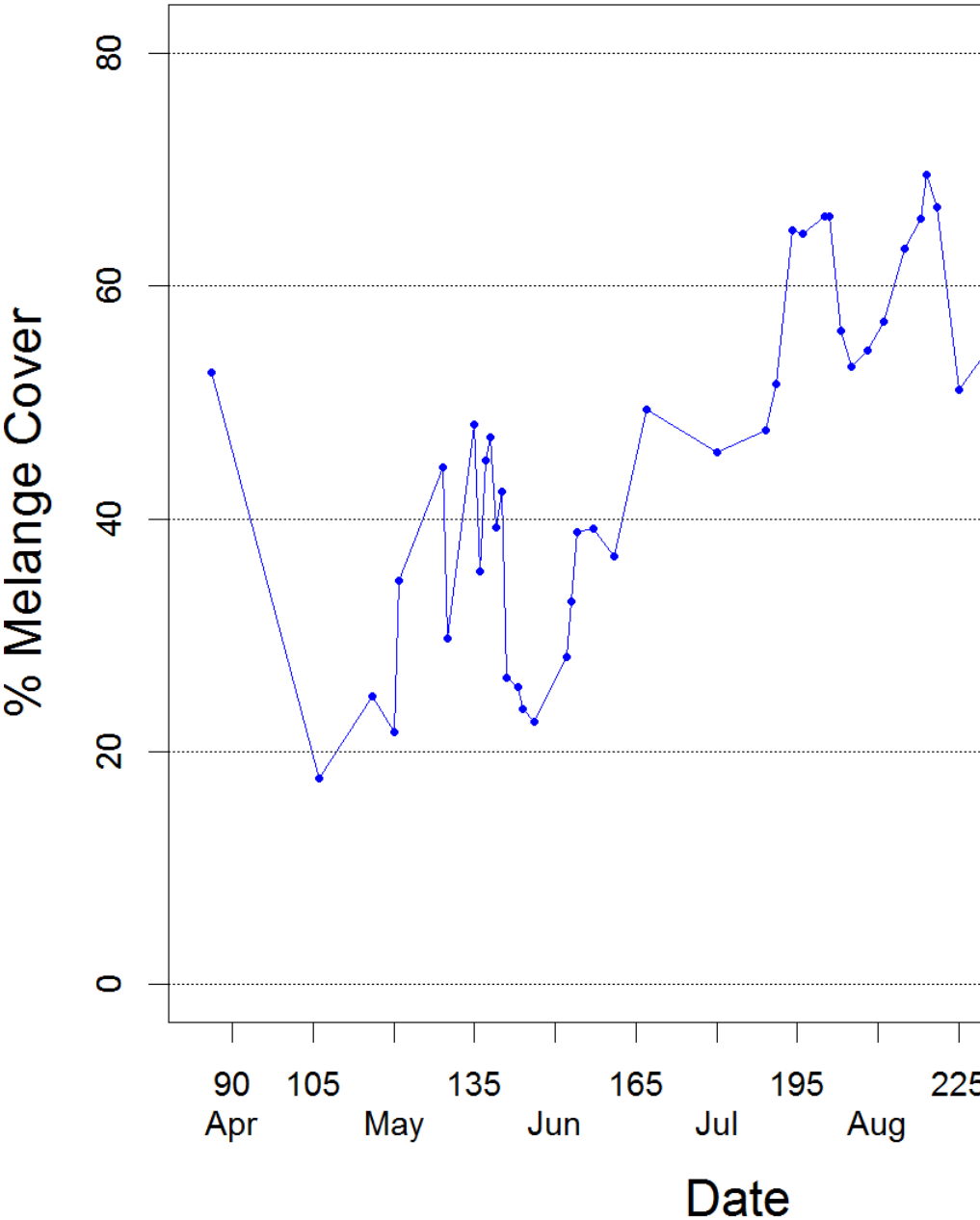


# K-means Clustering Helheim Glacier



# Helheim Glacier & Fjord Ice Cover

2010



Helheim Glacier - Monthly Melange Cover

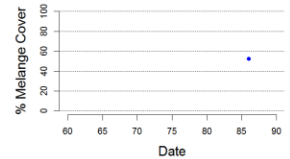
January

February

March

N/A

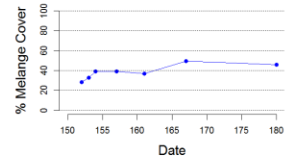
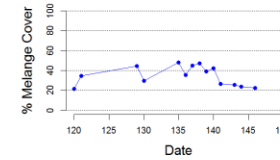
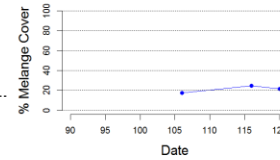
N/A



April

May

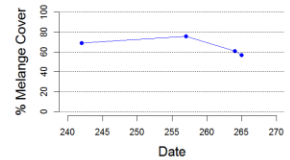
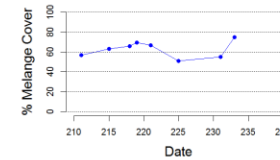
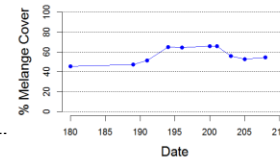
June



July

August

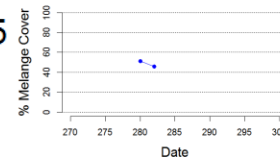
September



October

November

December

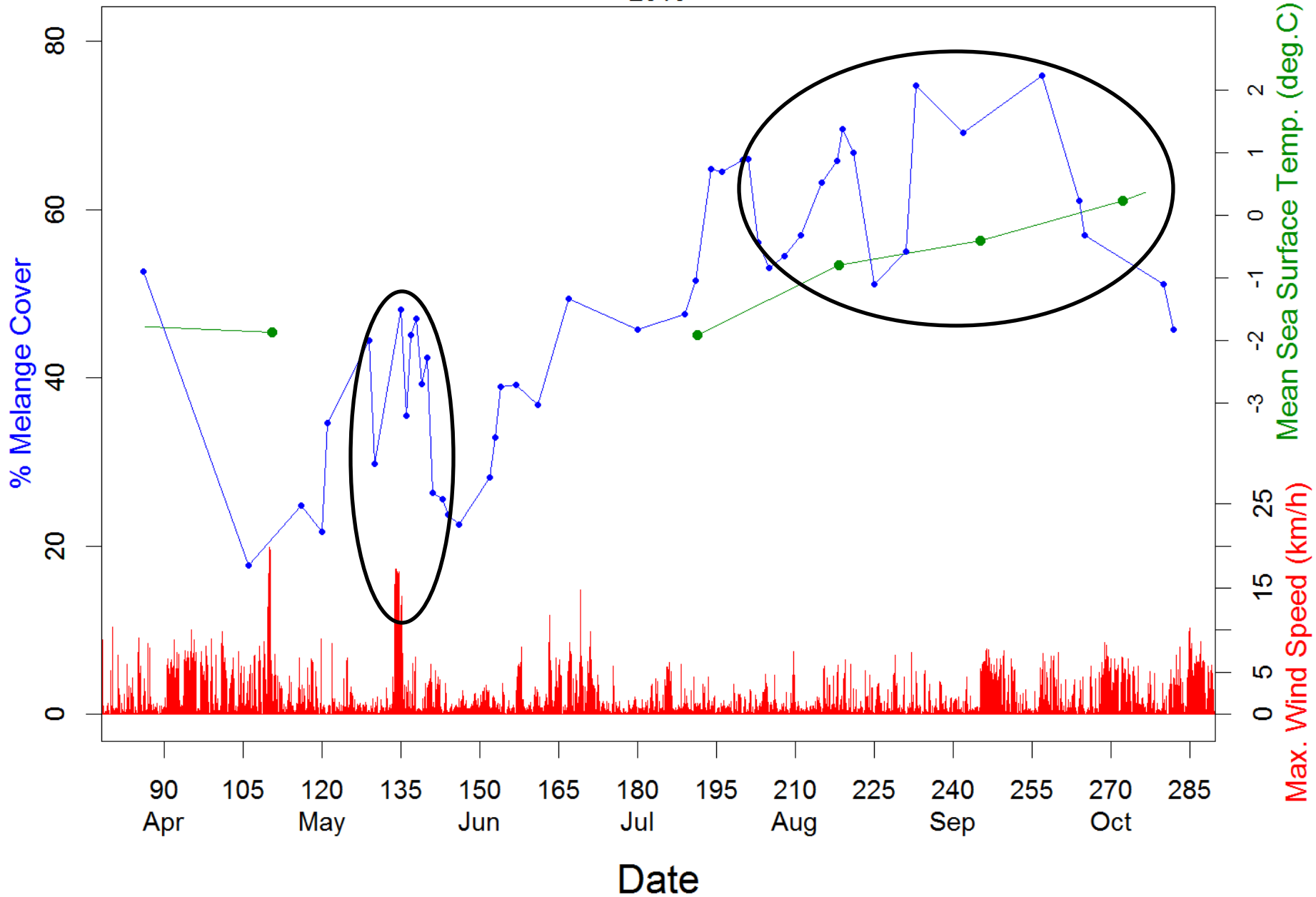


N/A

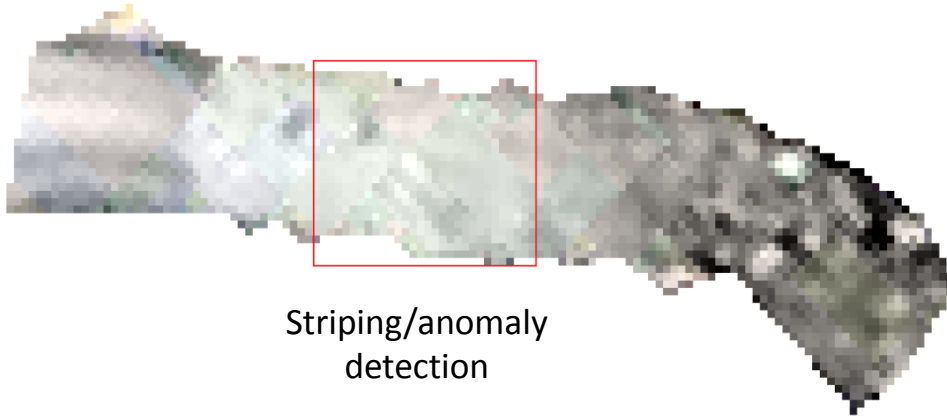
N/A

# HHG Melange Cover, Wind Speed, Sea Surface Temp.

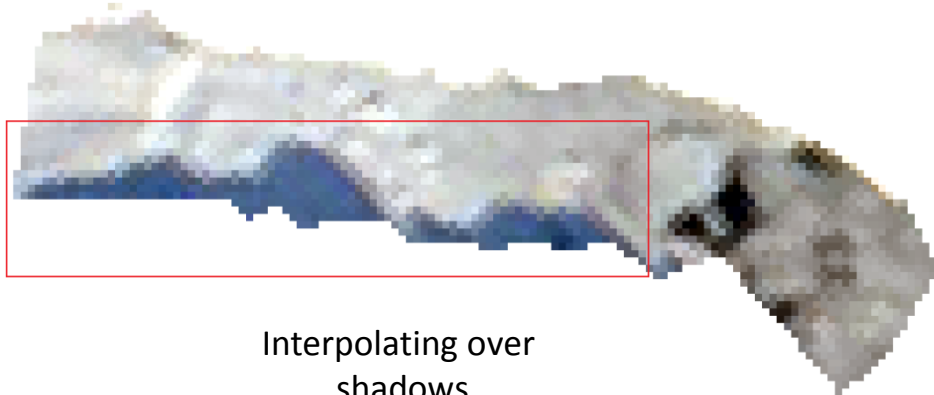
2010



# Current/Future Work

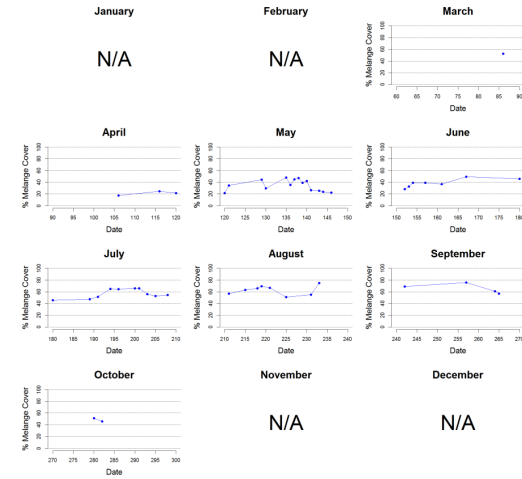


Striping/anomaly  
detection



Interpolating over  
shadows

Helheim Glacier - Monthly Melange Cover



**2002-2012**

Expand temporal  
coverage

# Acknowledgments

**Leigh Stearns** – Dept. of Geology – Project  
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Academic adviser

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