



LARES

Recent vegetation - temperature trends on arctic tundra using MODIS data

C. Mattar^{1,2}, J.C. Jiménez-Muñoz², J.A. Sobrino², C. Durán¹

1. Laboratory for Research in Environmental Science, University of Chile, Chile (cmattar@uchile.cl).
2. Global Change Unit, Image Processing Laboratory, University of Valencia, Spain.

ABSTRACT: In this work we investigate the feasibility of using MODIS global products to analyze the feedback between surface temperature and vegetation indices over arctic tundra classes. Recent trends (2001 – 2011) in NDVI and LST over arctic tundra were estimated using MODIS LST and NDVI products. Preliminary results show a significant positive trend for LST in all tundra classes, whereas trends in NDVI were not statistically significant probably due to cloud contamination. Further analysis is being conducted to assess the MODIS data quality over this biome (**Keyword: Tundra, LST, NDVI, trends**)

INTRODUCTION

- Arctic tundra is the most important biome in the world.
- Sensible to global warming and therefore global change.
- Positive feedback between snow melting – growing vegetation.

DATA

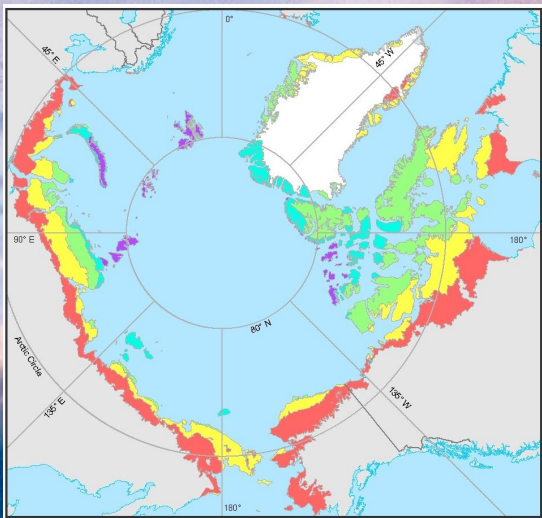
- **MODIS PRODUCTS**
 - MODIS (MOD11) LST monthly mean at 5 km spatial resolution.
 - MODIS (MOD13) NDVI monthly mean at 5 km spatial resolution.
- **CAVM LAND COVER**
 - Tundra areas.

METHOD

Non parametric Statistical Test

- Mann - Kendall Trend Significance
- Sen Slope Trend estimation

STUDY AREA

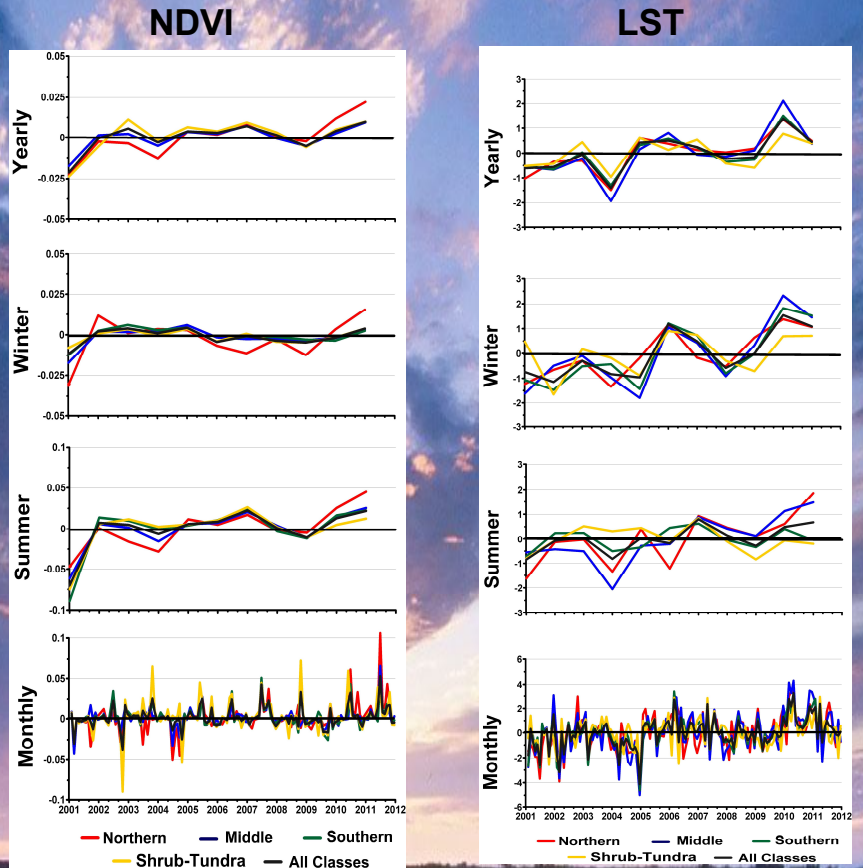


CLASS

Area

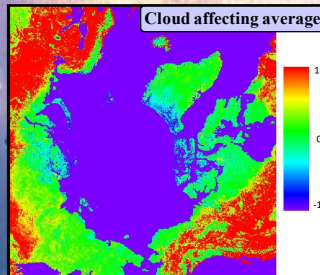
Arctic Polar desert	195x10 ³ km ²
Northern Arctic tundra	512x10 ³ km ²
Middle Arctic tundra	1301x10 ³ km ²
Southern Arctic tundra	1576x10 ³ km ²
Arctic shrub-tundra	1842x10 ³ km ²
Glaciers	1697x10 ³ km ²
Non Arctic	

Yearly, Winter (DJF), Summer (JJA) and Monthly Anomaly trends

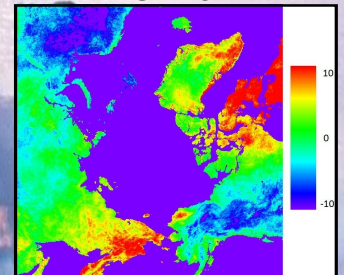


Cloud mask is the main factor for NDVI quality data. During the Last decade positive and significant statistical trends ($p < 0.001$) for LST were estimated for each arctic tundra class. Spatialized anomalies for LST and NDVI for summer (JJA) and winter (DJF) during 2011 are presented in the following figures.

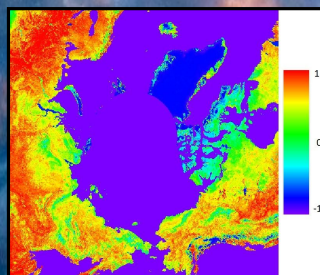
NDVI DJF



LST DJF



NDVI JJA



LST JJA

