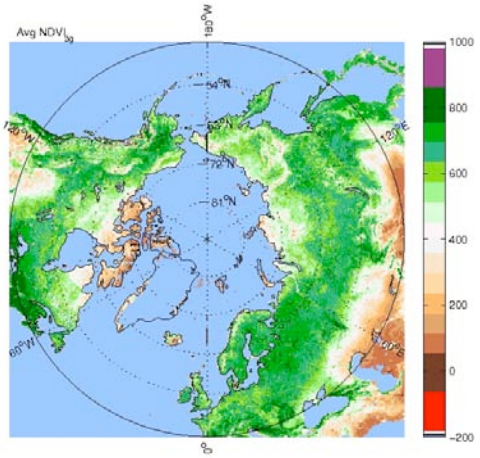
# GIMMS 3g NDVI set and global NDVI trends

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# New GIMMS-$NDVI_{3g}$ for Arctic Regions

- Data continuity AVHRR-MODIS-VIIRS
  - Quantify photosynthesis on the land
  - MODIS substantial improvement over AVHRR
  - Through scientific analysis, AVHRR and MODIS can be combined
  - VIIRS follow-on instrument (NPP – Sep 2011)
- Comprehensive analysis of NDVI trends in the High Arctic – Other presentations

# Requirements of NDVI data for monitoring vegetation dynamics

- Reliable sources of consistent long time series data: the continuum of AVHRR and MODIS data provide a nearly 30-year product of global land photosynthesis
- Effective temporal and spatial scales: bimonthly 8km data.
- Repetitive automated measurements: data updated every quarter
- Continuity: methodology can be adapted to add VIIRS into the continuum

# Can NDVI- AVHRR and MODIS be combined? VIIRS?

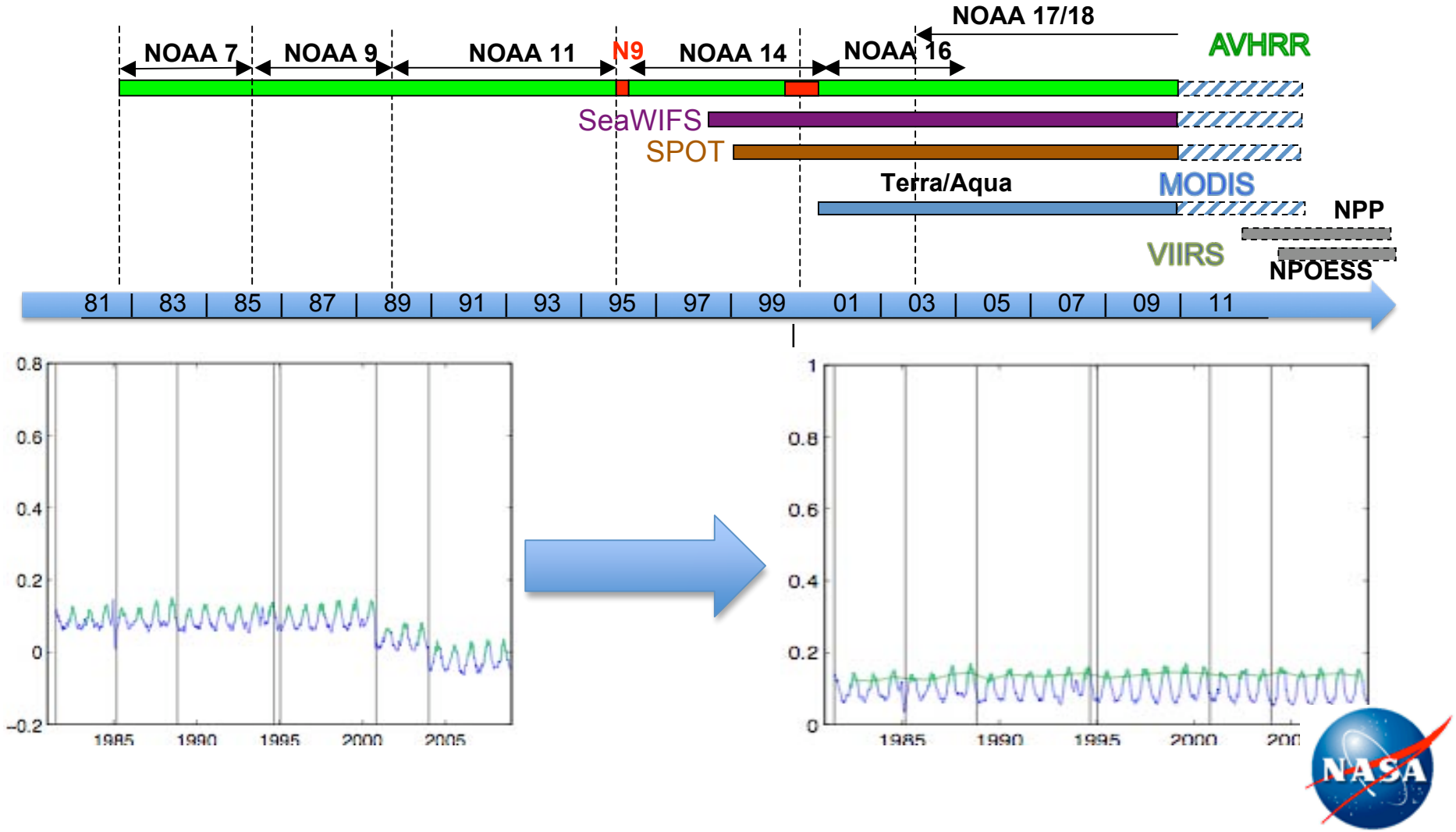
| Sensor | VIS (nm) | NIR (nm) | Radiometric | Spatial |
|---|---|---|---|---|
| AVHRR | 580-680 | 725-1100 | 0-1023 | 8km (1.1km) |
| MODIS | 620-670 | 841-876 | 0-4095 | 250m |
| VIIRS | 600-680 | 846-885 | 0-1023 | 375m |

$$NDVI = (NIR-VIS)/(NIR+VIS)$$

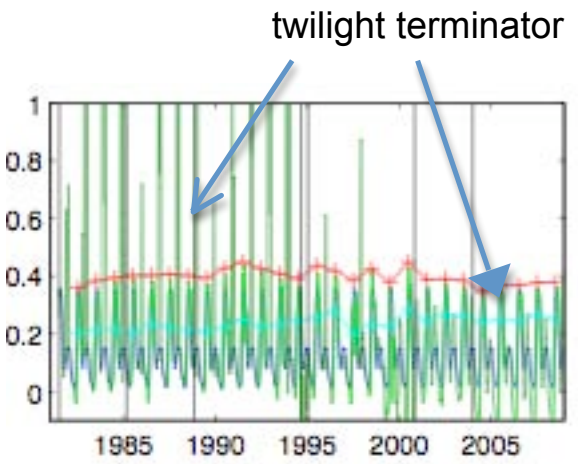
Recalibration through histogram regularization

$$(X- m1)*s2/s1 + m2$$

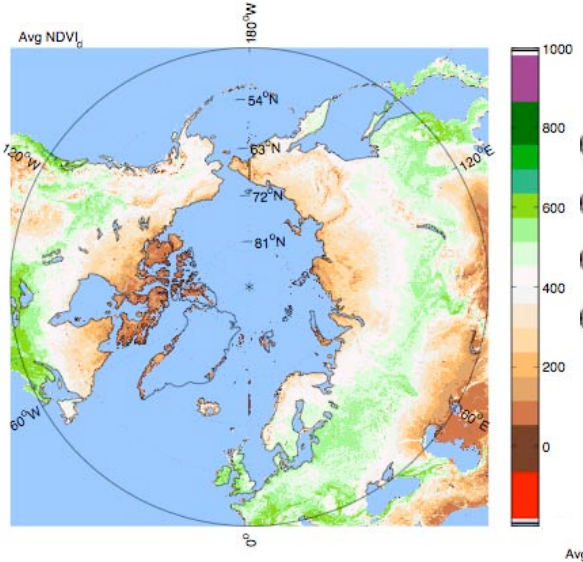
# Improving spectral sensitivity and temporal discontinuities

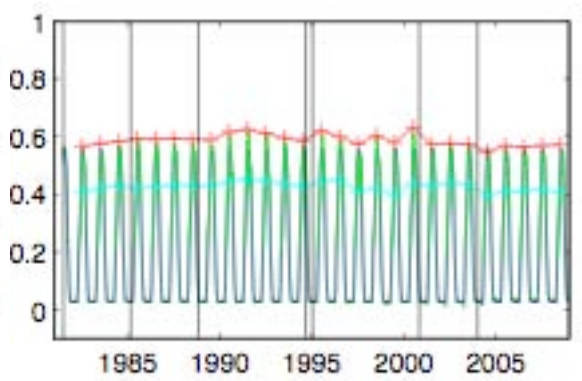


- Improving AVHRR spectral sensitivity and artifacts

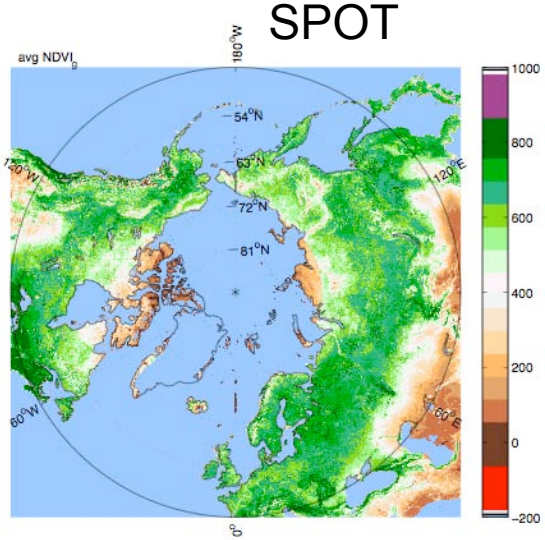


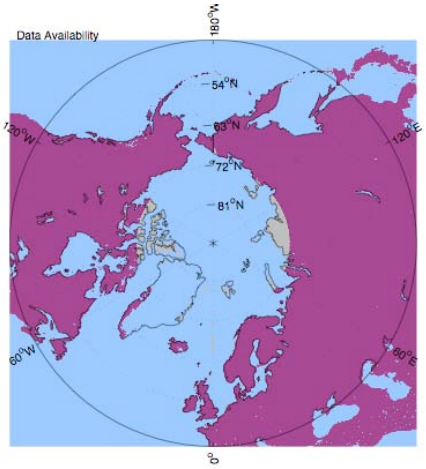

SPOT

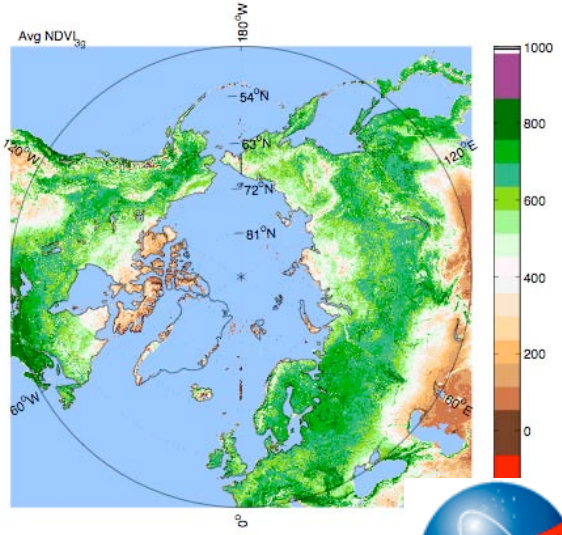


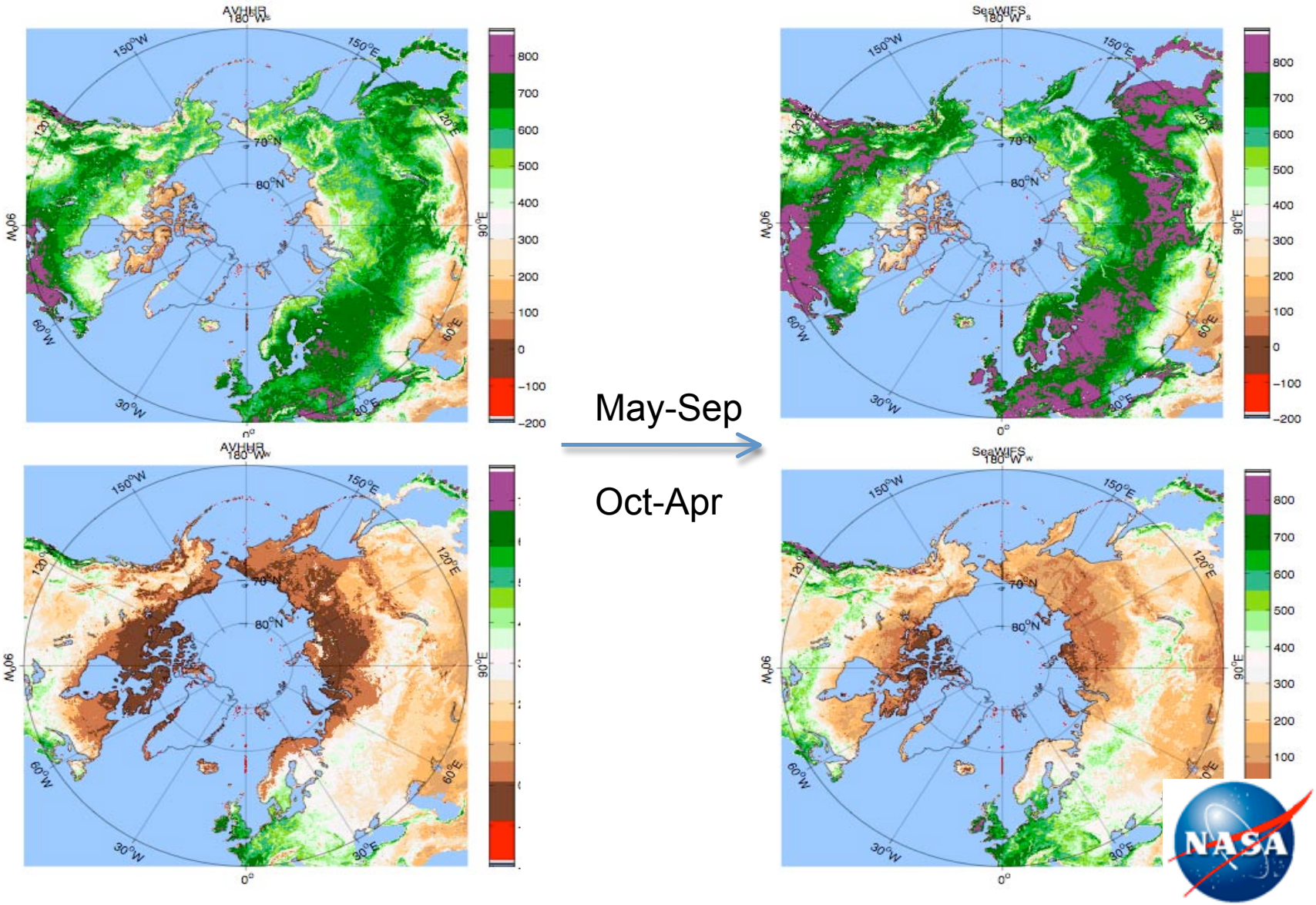

SeaWIFS



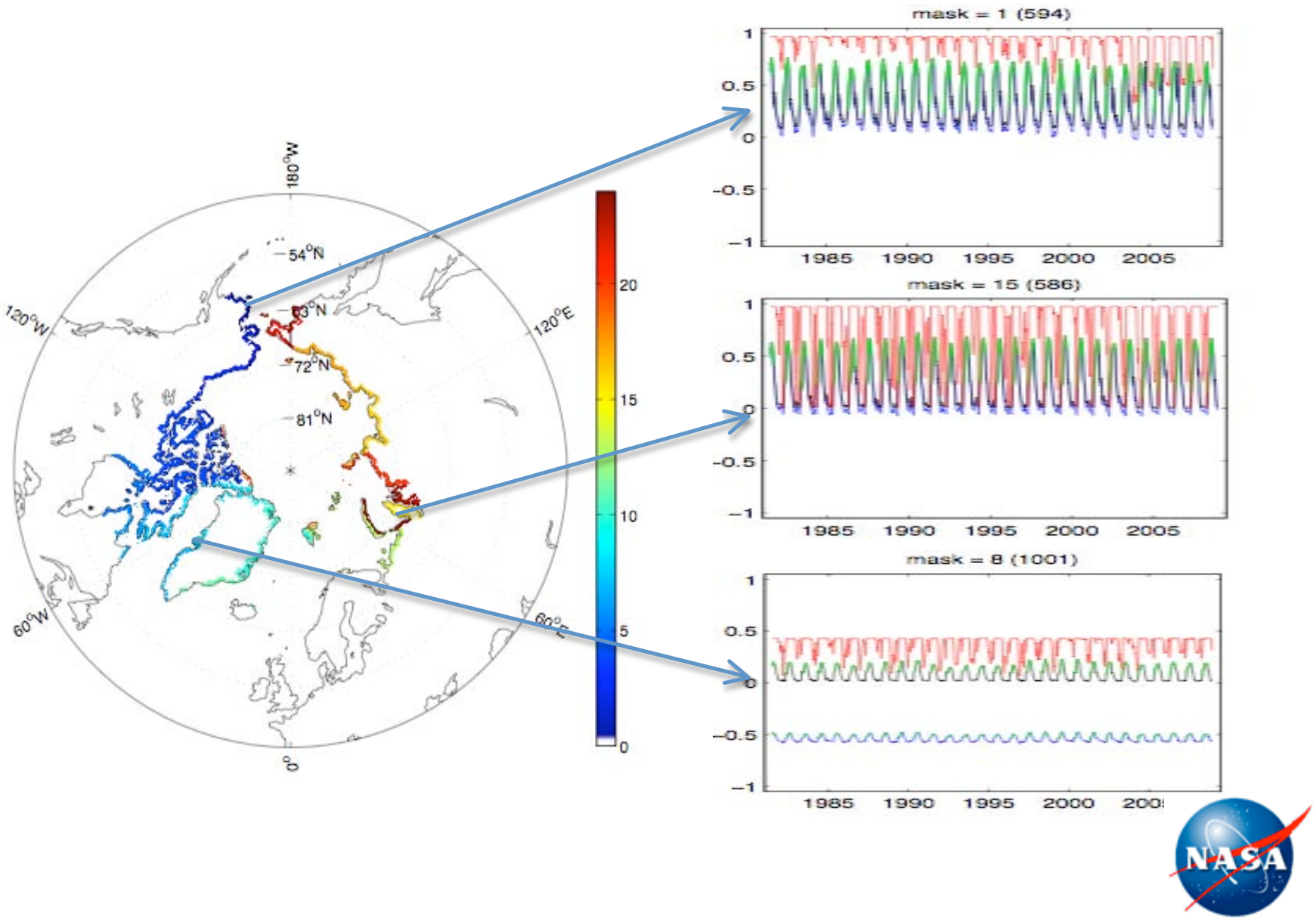



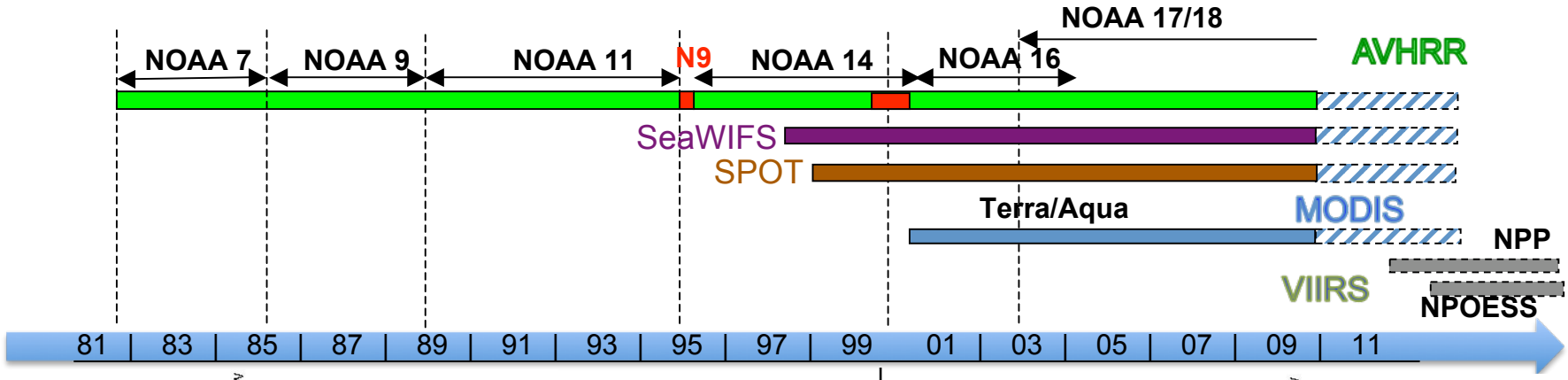
# New spectral sensitivity May->Sep-based

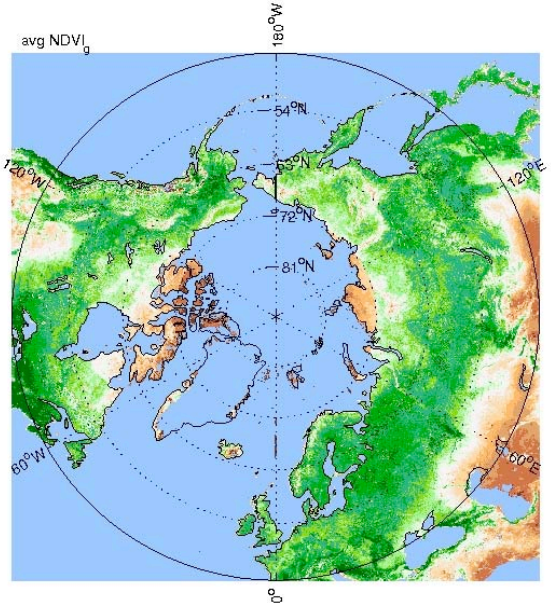


# Time series from High Arctic



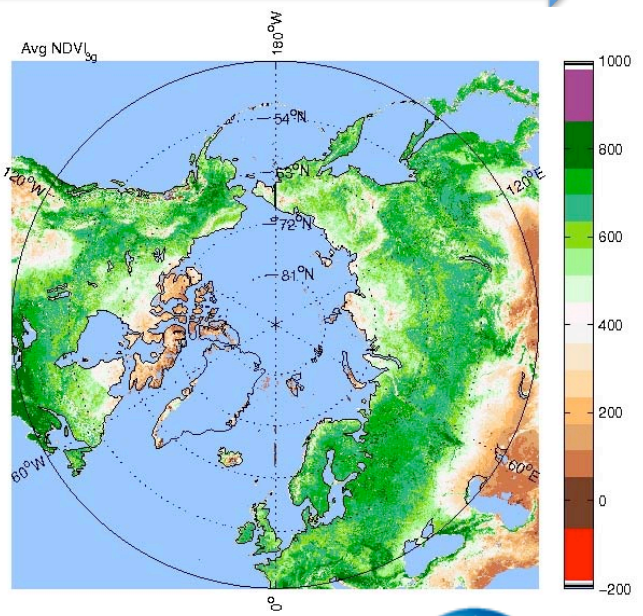
# Conclusion New GIMMS-NDVI$_{3g}$ for Arctic Regions




## Calibration Parameters

| NDVI$_g$ | NDVI$_{3g}$ |
|---|---|
| SPOT-based | SeaWIFS- based |
| Jan->Dec based<br>Terminator effects leaks | May->Sep based |
| NOAA 17<br>Missing data in summer | NOAA-17&18<br>Integration |
| 72$^0$N spatial discontinuity<br>Snow-melting detection | Fixed<br>Improving in process |




**NDVI$_g$** → **NDVI$_{3g}$**

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