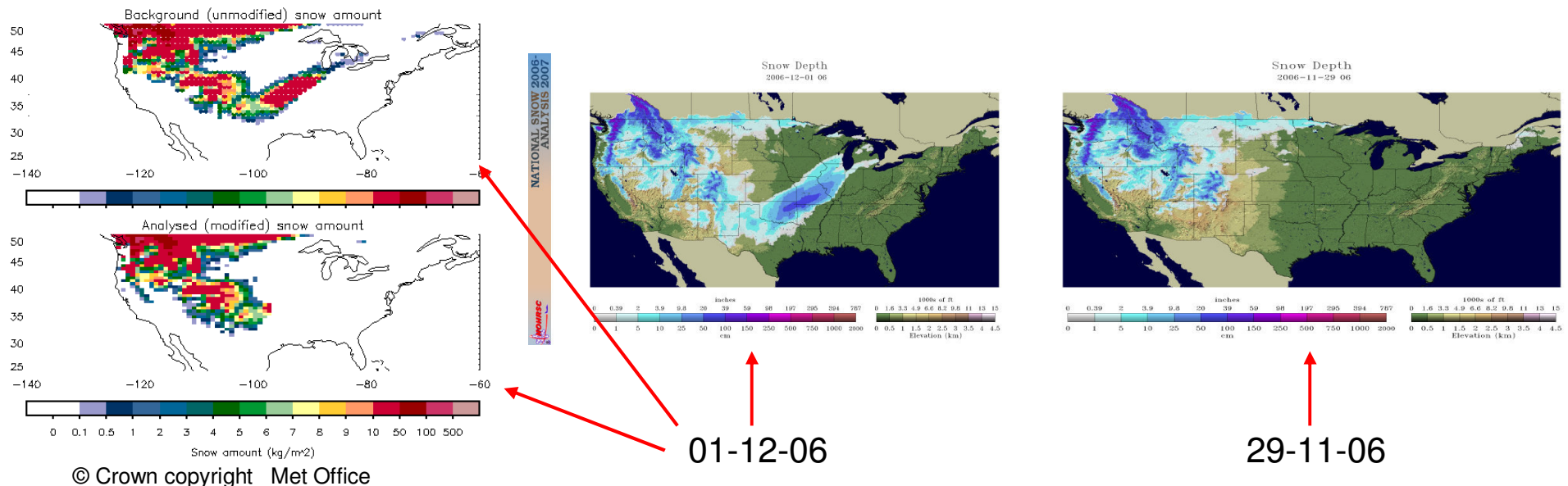




Use of snow data in NWP

- 1st use of snow cover obs in global NWP model recently implemented, using NOAA/NESDIS IMS product (NH, 4km, daily, operational)
- NH daily snow analysis uses fractional cover, derived from IMS, to modify model snow amounts
- But time delays in parts of the product can lead to incorrect removal of snow from the model by the analysis





Requirements for NWP

- Need global snow cover product, with improved timeliness (all data within 24 hours). *N.B. S.H. snow.*
- 4 km adequate currently, but resolution of our NWP models increasing, with 1.5 km UK planned for 2010. Need snow cover at higher resolution than model grid to be able to derive fractional cover
- Snow Water Equivalent will be useful to supplement SYNOPS snow-depth assimilation in future. Target 12 km resolution, daily, global
- General requirements: operationally robust, daily, within 24 hours, well characterised errors, 1 km resolution, regular lat-lon grid, GRIB or NetCDF
- Associated data: data confidence map, map of time of last ob, flags for wet snow, cloud contamination, low light levels etc., validation in broad- and needle-leaved forest, urban, mountainous and grassland regions.



Requirements for climate

- Monthly mean climatology of snow area required to evaluate performance of climate models.
- Monthly time series of snow cover required to assess spatial and temporal variability and trends.
- Currently use Rutgers University snow fraction product – need more, different snow analyses to be able to assess observational error for this type of product.
- Global, monthly, continuous 1960-present, minimum 1x1 degree spatial resolution, within 10% accuracy. Delivery time not important. Regular lat-lon grid, NetCDF.
- Important associated data: data confidence map, data frequency map (dependent on QC and satellite down-time), flags for wet snow, cloud contamination, low light levels etc..., validation in broad- and needle-leaved forest, urban, mountainous and grassland regions.



Summary

- Met Office (UK) has a requirement for snow cover products for both NWP and climate applications.
- SWE will be very useful for validation purposes and potential NWP assimilation.
- Error characterisation is of key importance for both NWP and climate
- NWP requires an operationally robust service with near-real-time delivery.
- Climate applications require long-term historical records, with continuity and consistency between successive sensors
- *N.B. Proposed Regional and Global Reanalyses will have requirements also*