

# Synthetic Landsat Data

Pontus Olofsson, Zhe Zhu and  
Curtis E. Woodcock

*Dept of Geography and Environment, Boston University  
675 Commonwealth Avenue, Boston, MA 02215, USA*

Corresponding authors  
[olofsson@bu.edu](mailto:olofsson@bu.edu)  
[zhuhe@bu.edu](mailto:zhuhe@bu.edu)  
[curtis@bu.edu](mailto:curtis@bu.edu)

*Research funded by NASA*



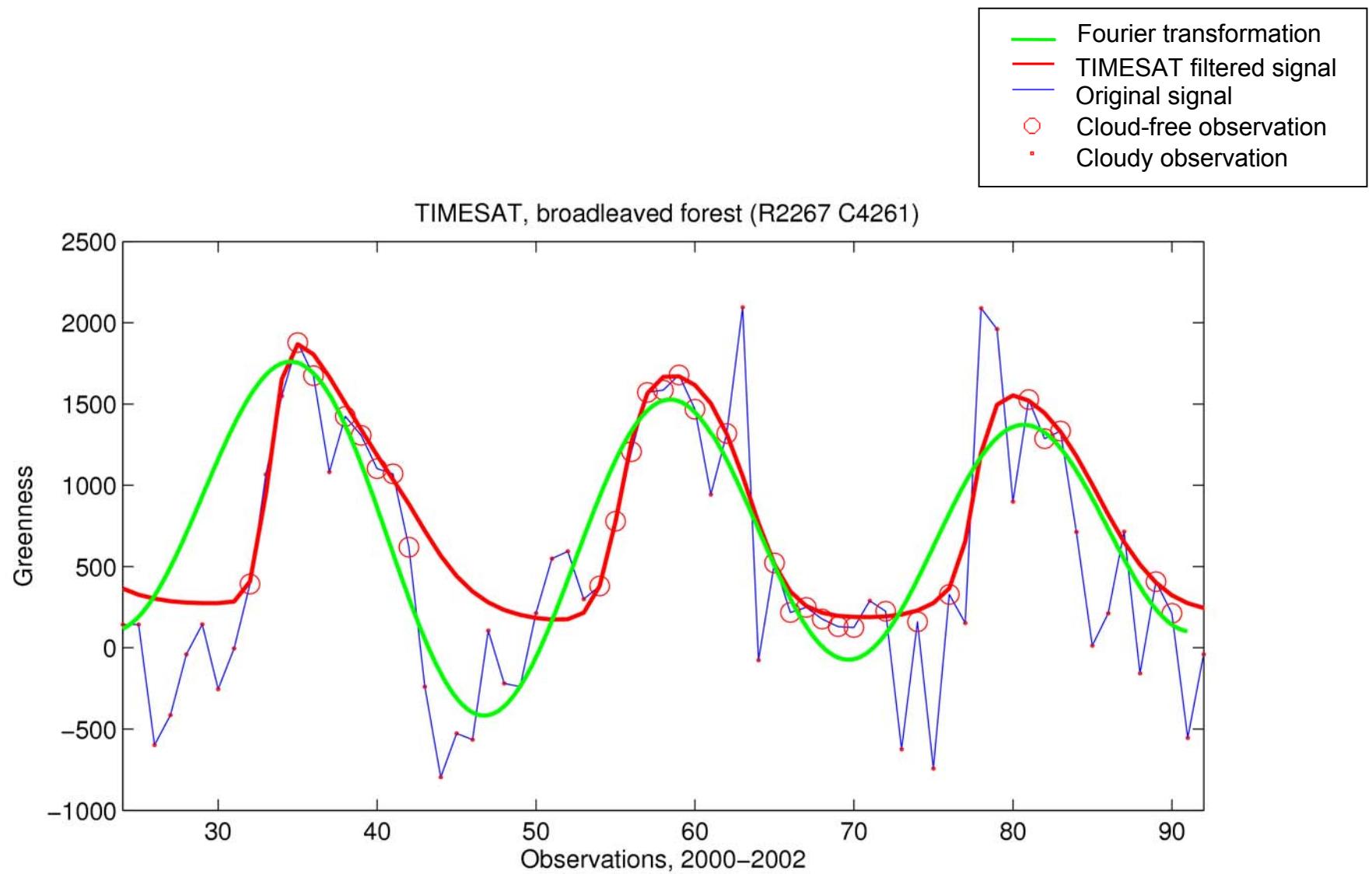
# Methodology

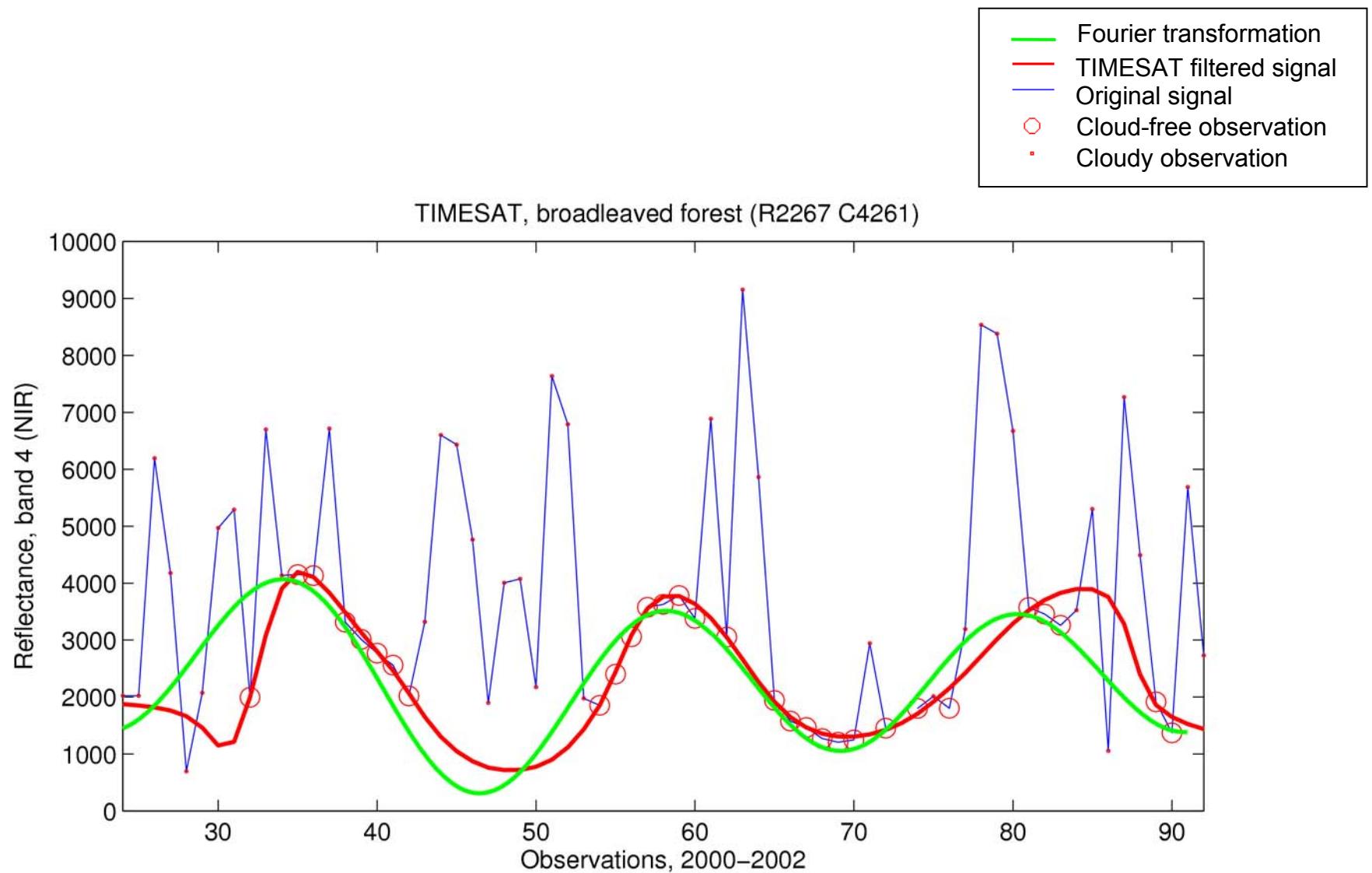
Function fitting to timeseries of Landsat observations – two methods:

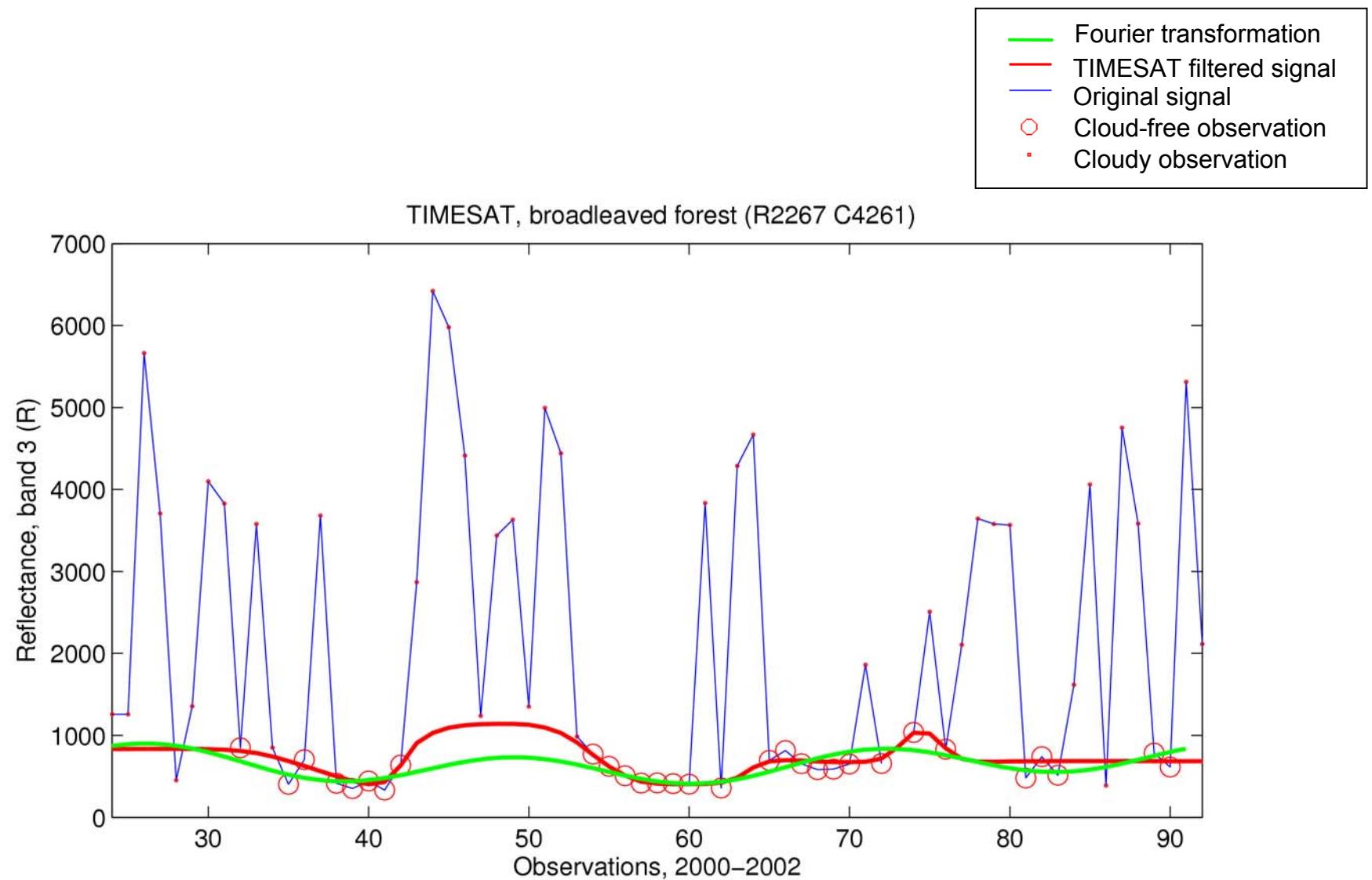
1. Fourier transformation (see Zhe's pres.)
2. TIMESAT<sup>1,2,3</sup> – local fits of model functions to Landsat observations weighted by cloud masks

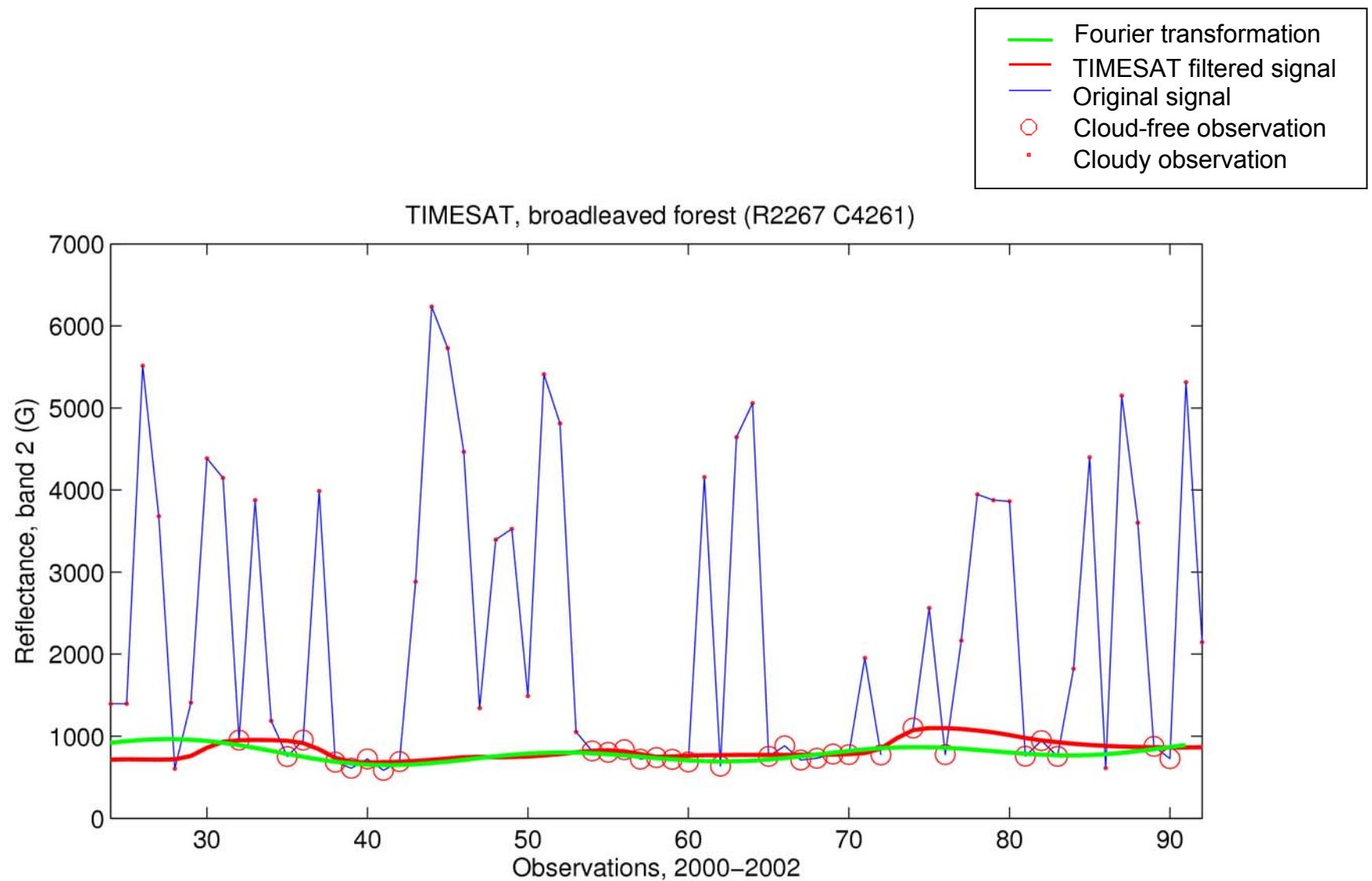
1. JÖNSSON, P. and EKLUNDH, L., 2002. *IEEE Transactions on Geoscience and Remote Sensing*, 40 (8), 1824-1832
2. JÖNSSON, P. and EKLUNDH, L., 2004. *Computers and Geosciences*, 30 (8), 833-845
3. OLOFSSON, P. and EKLUNDH, L., 2007. *Remote Sensing of Environment*, 207 (110), 240-251

# Broadleaved Forest

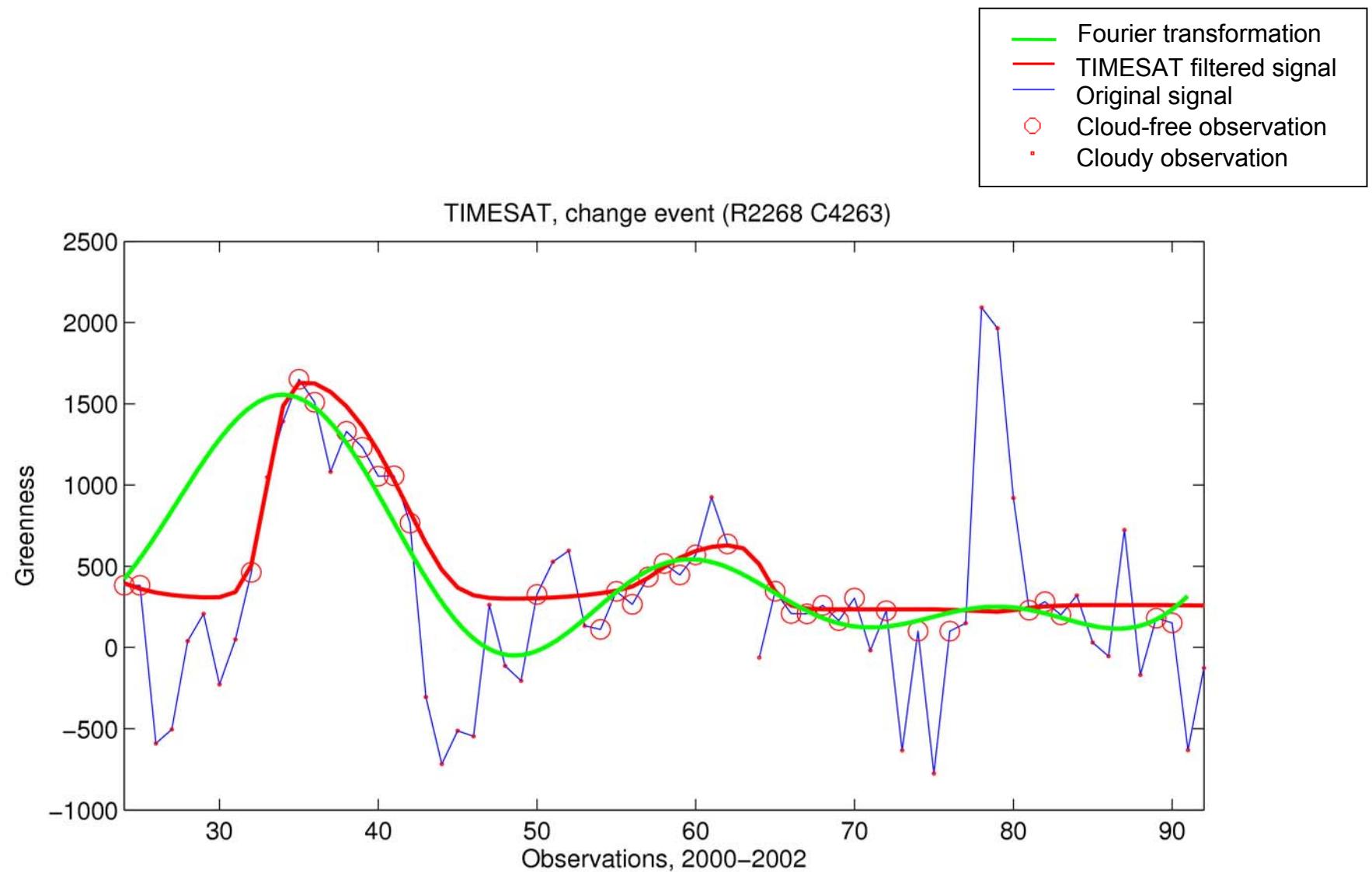


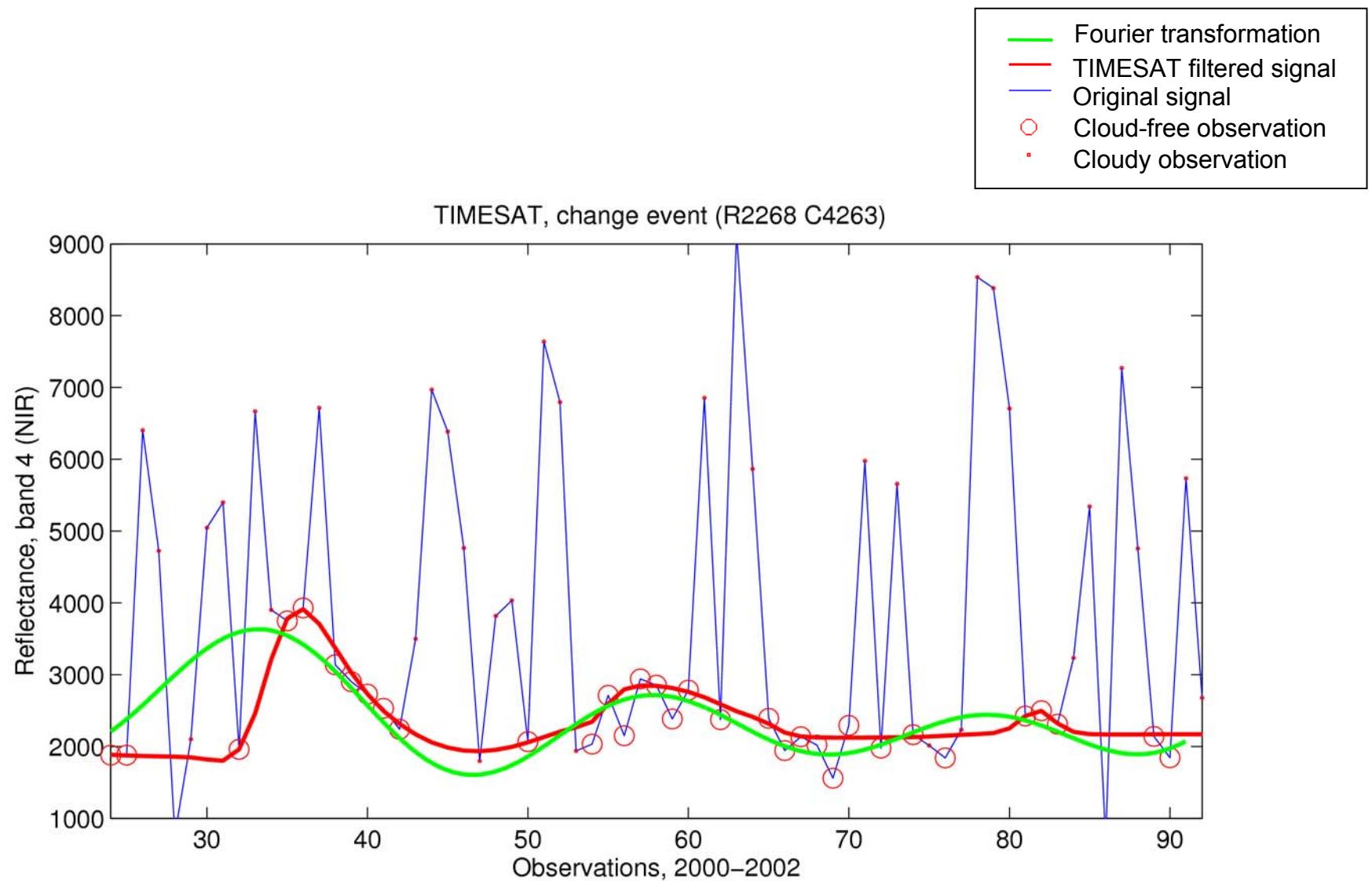


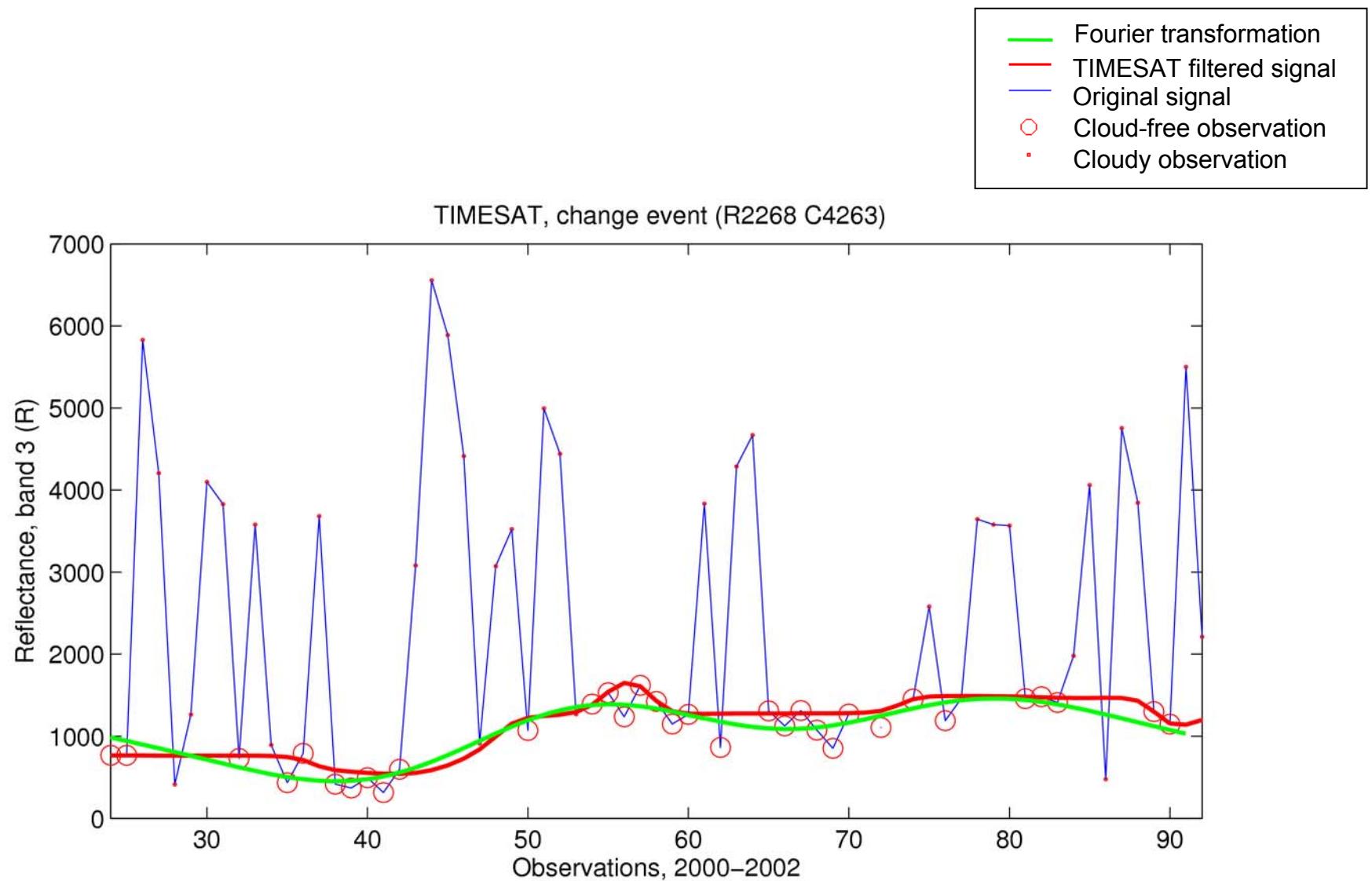


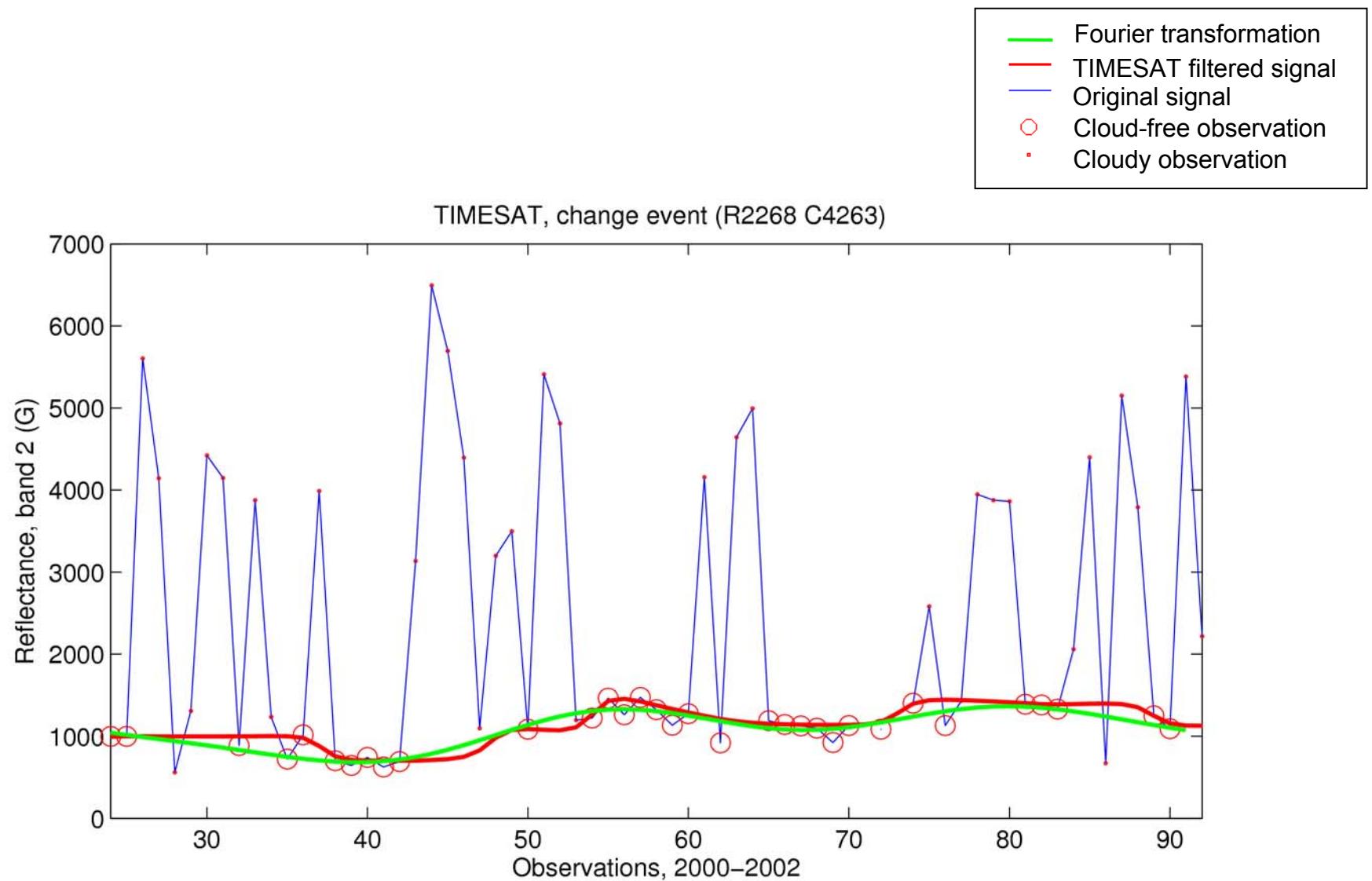


# Change event

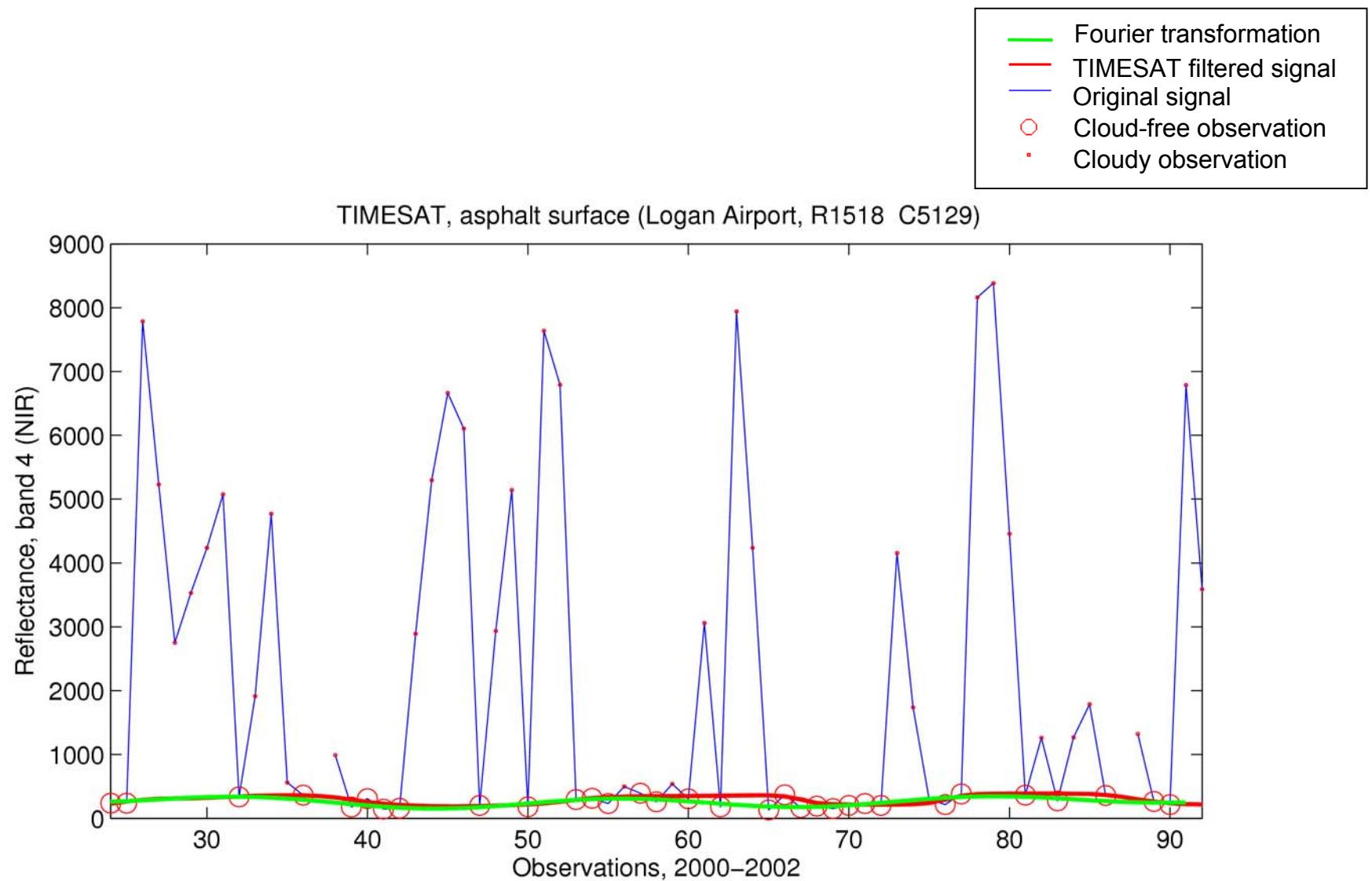


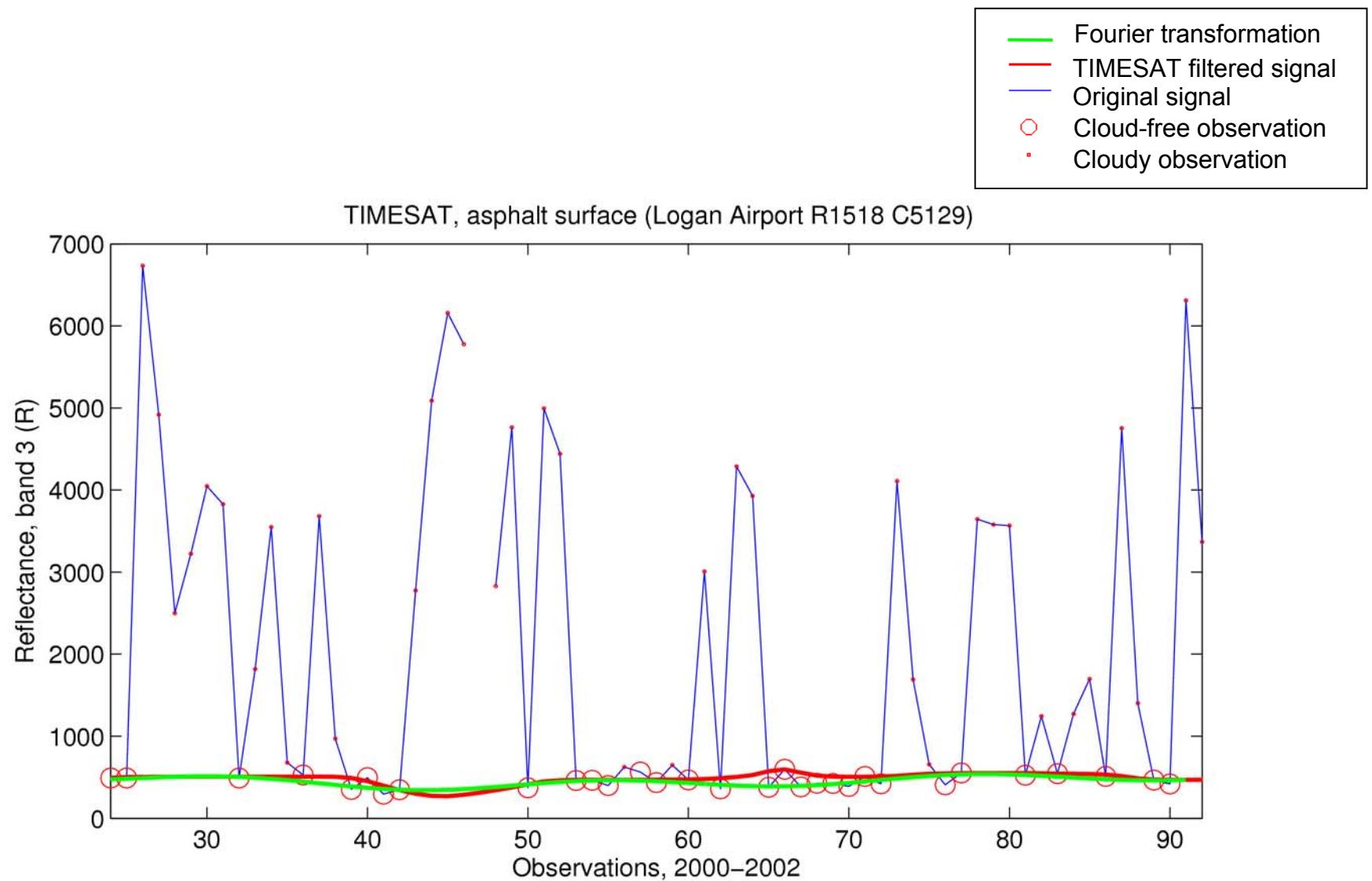


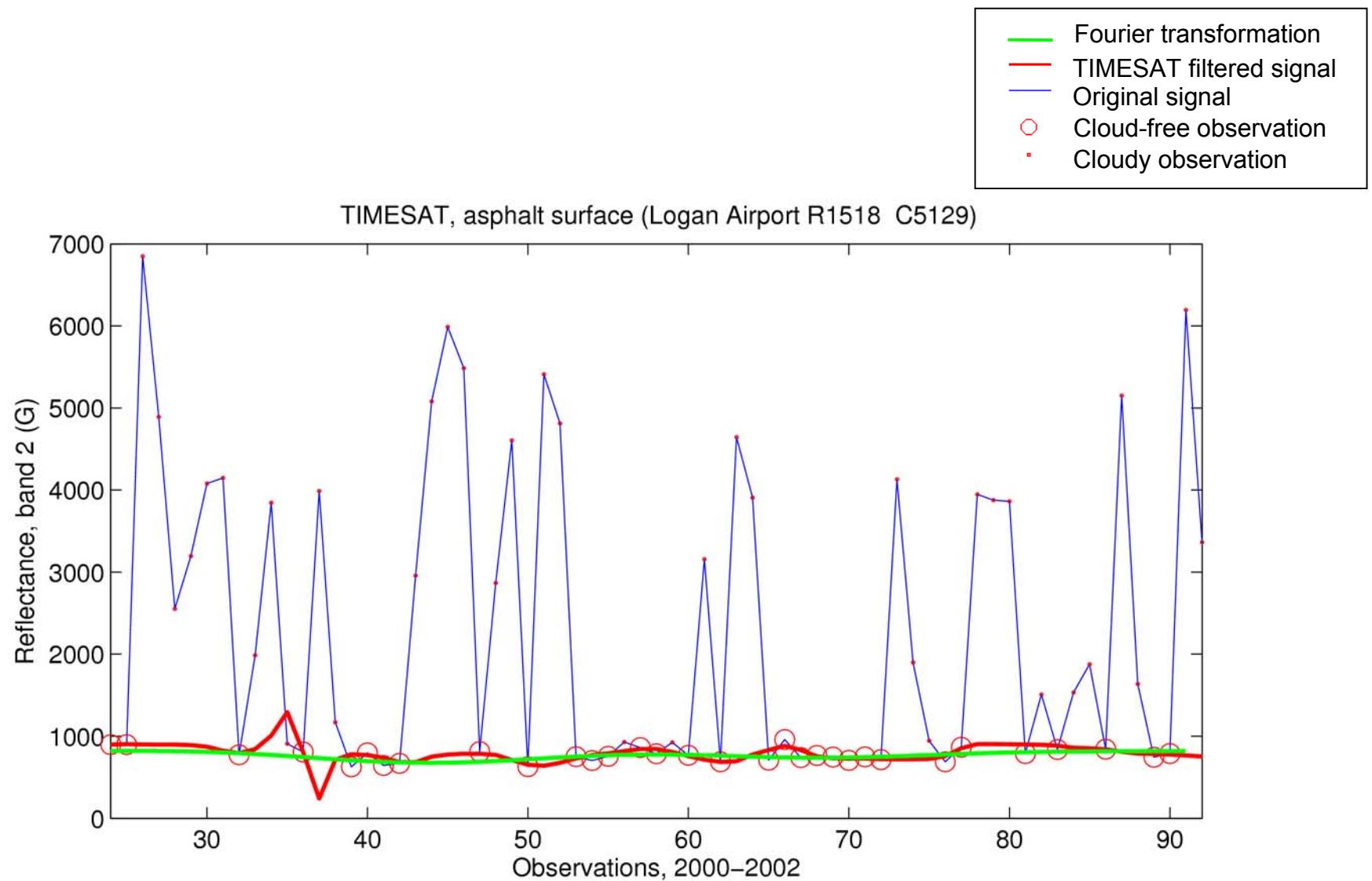




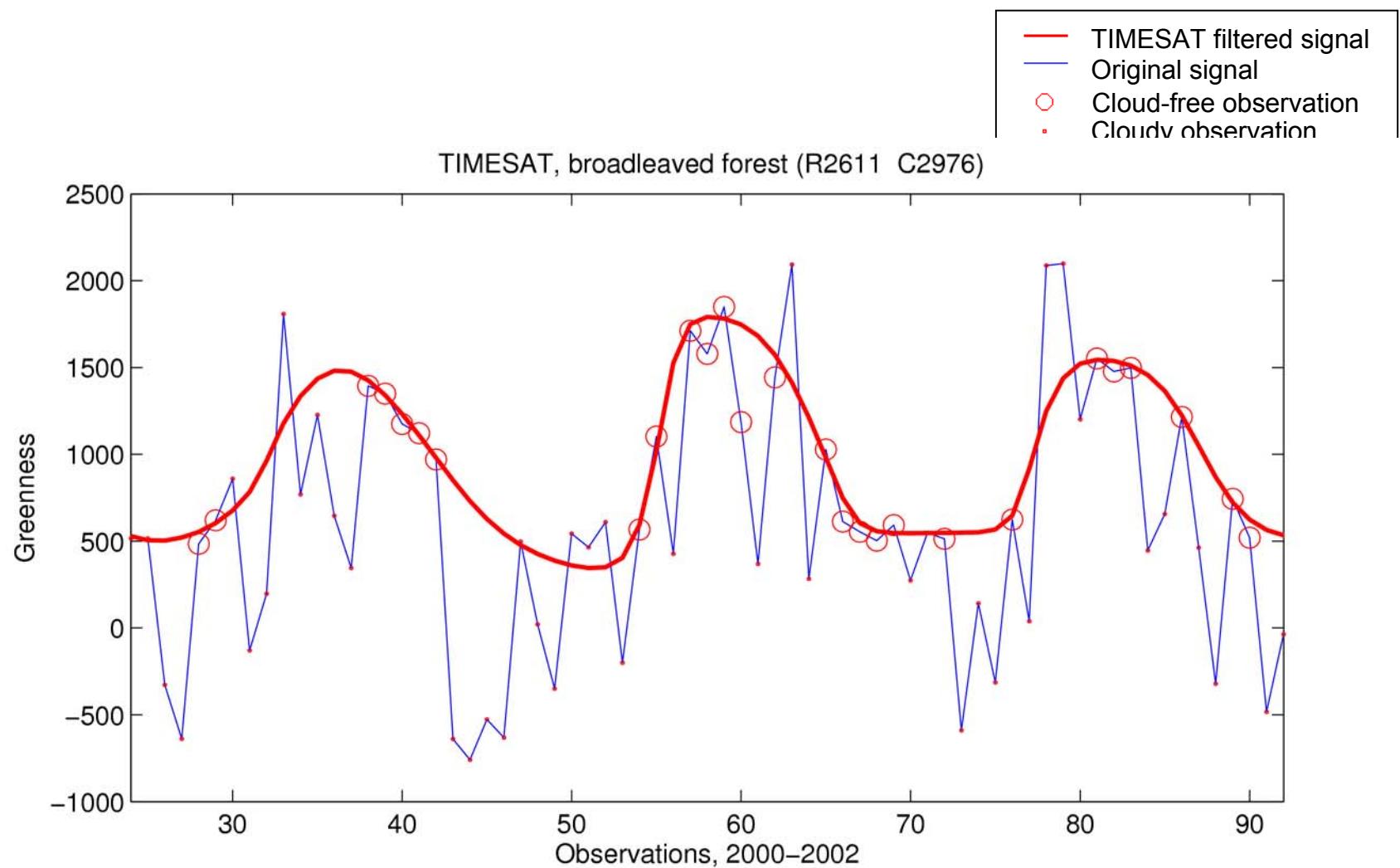
# Asphalt surface



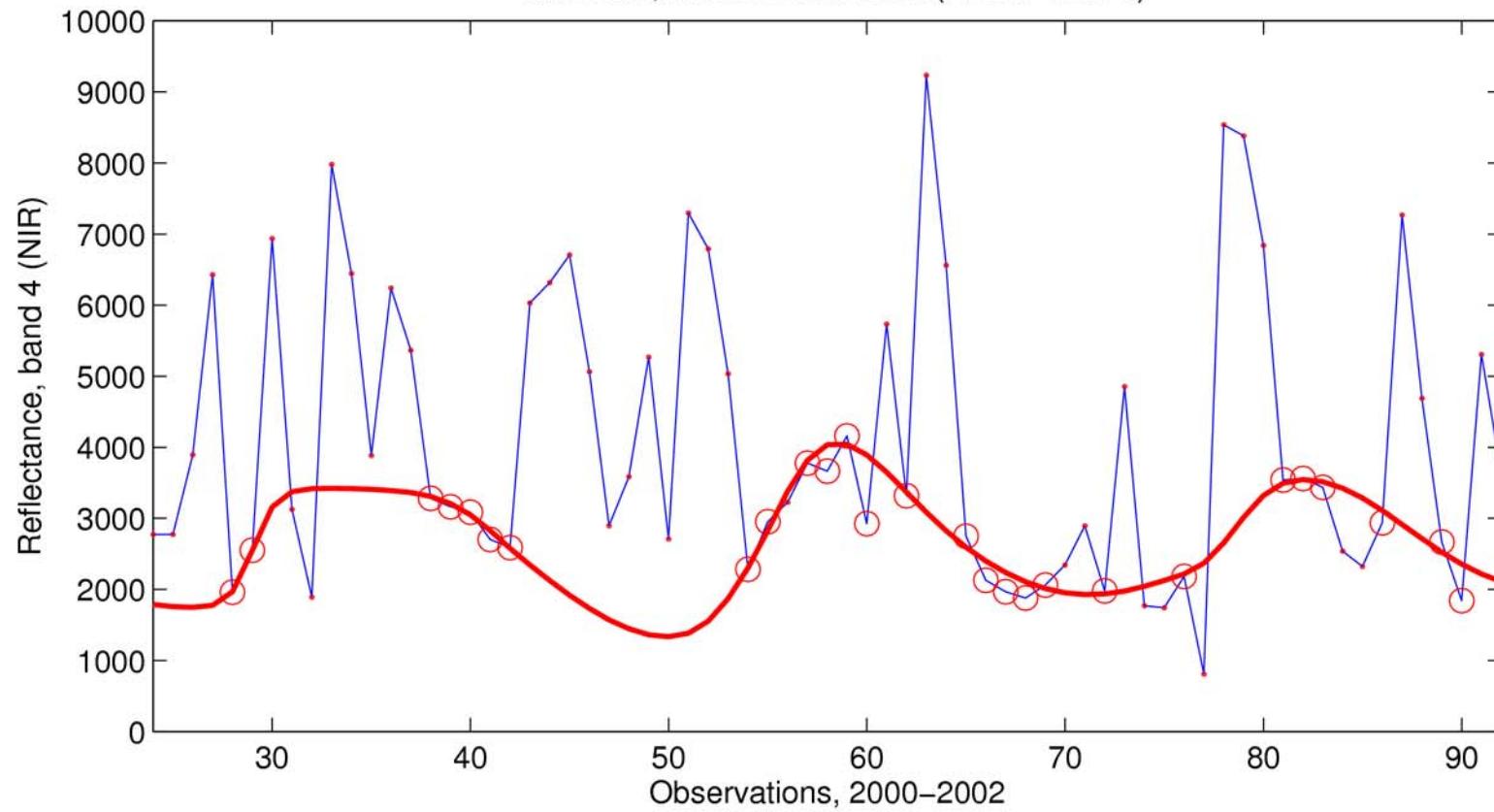




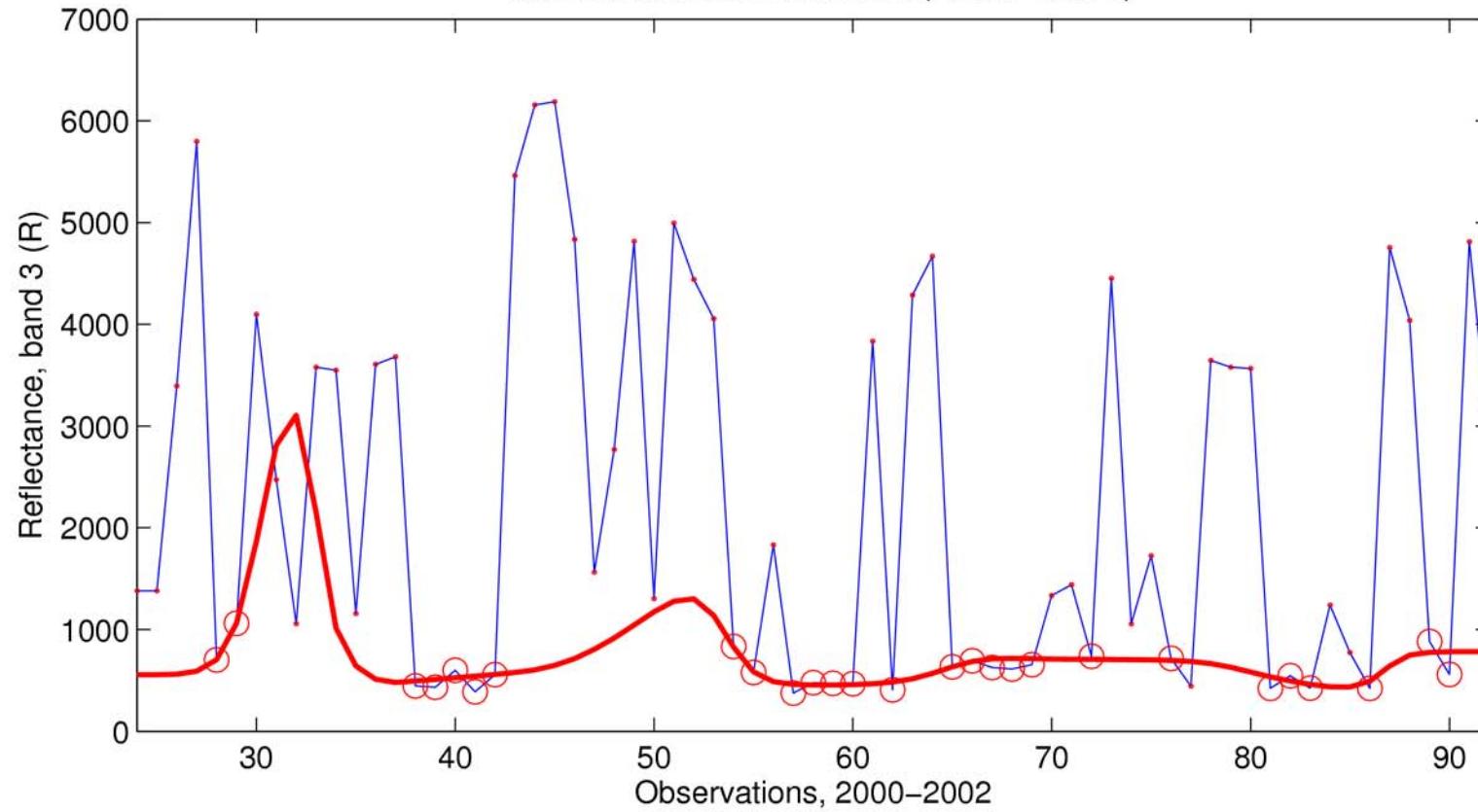
Broadleaved Forest (fail)



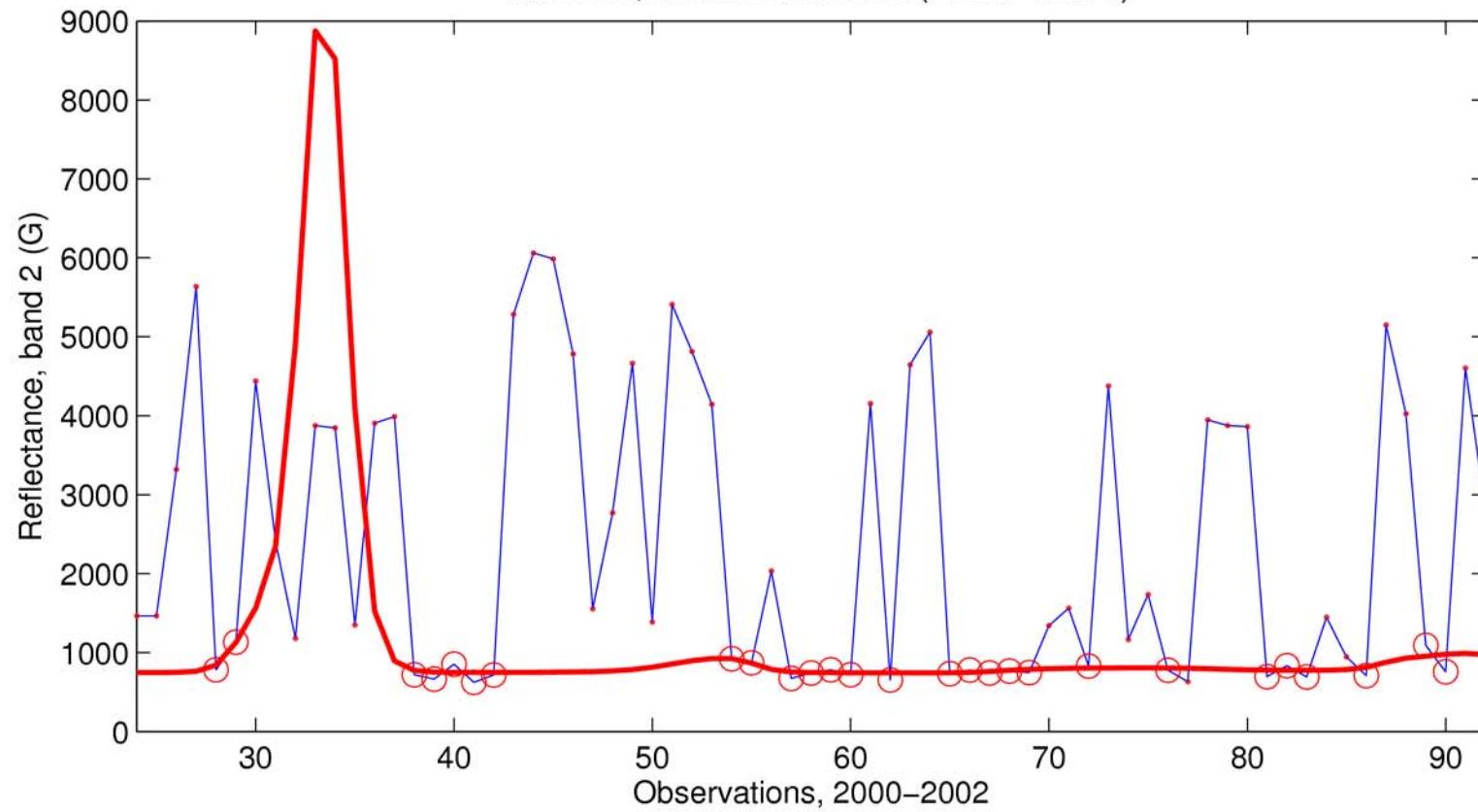
TIMESAT, broadleaved forest (R2611 C2976)



TIMESAT, broadleaved forest (R2611 C2976)

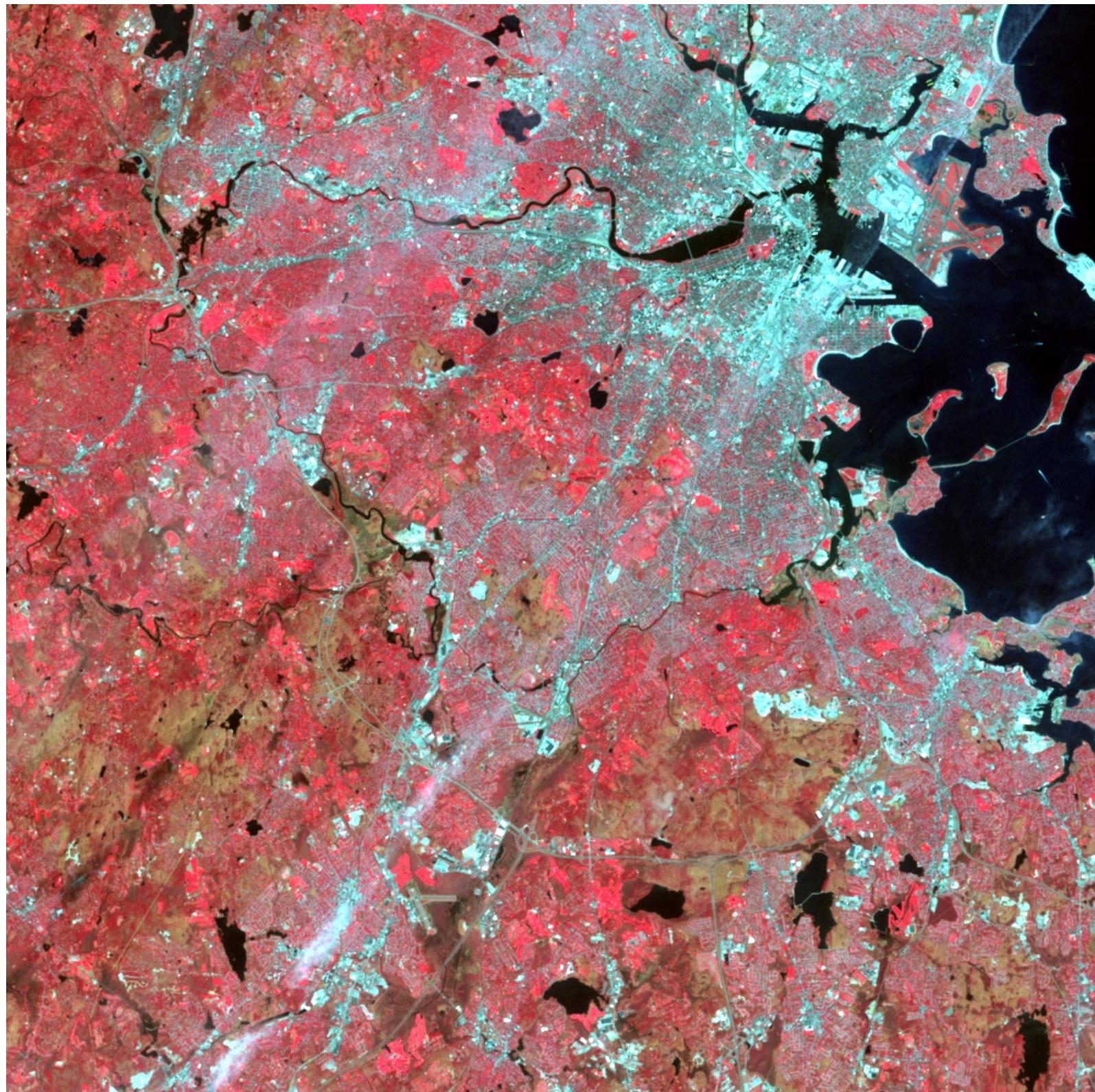


TIMESAT, broadleaved forest (R2611 C2976)

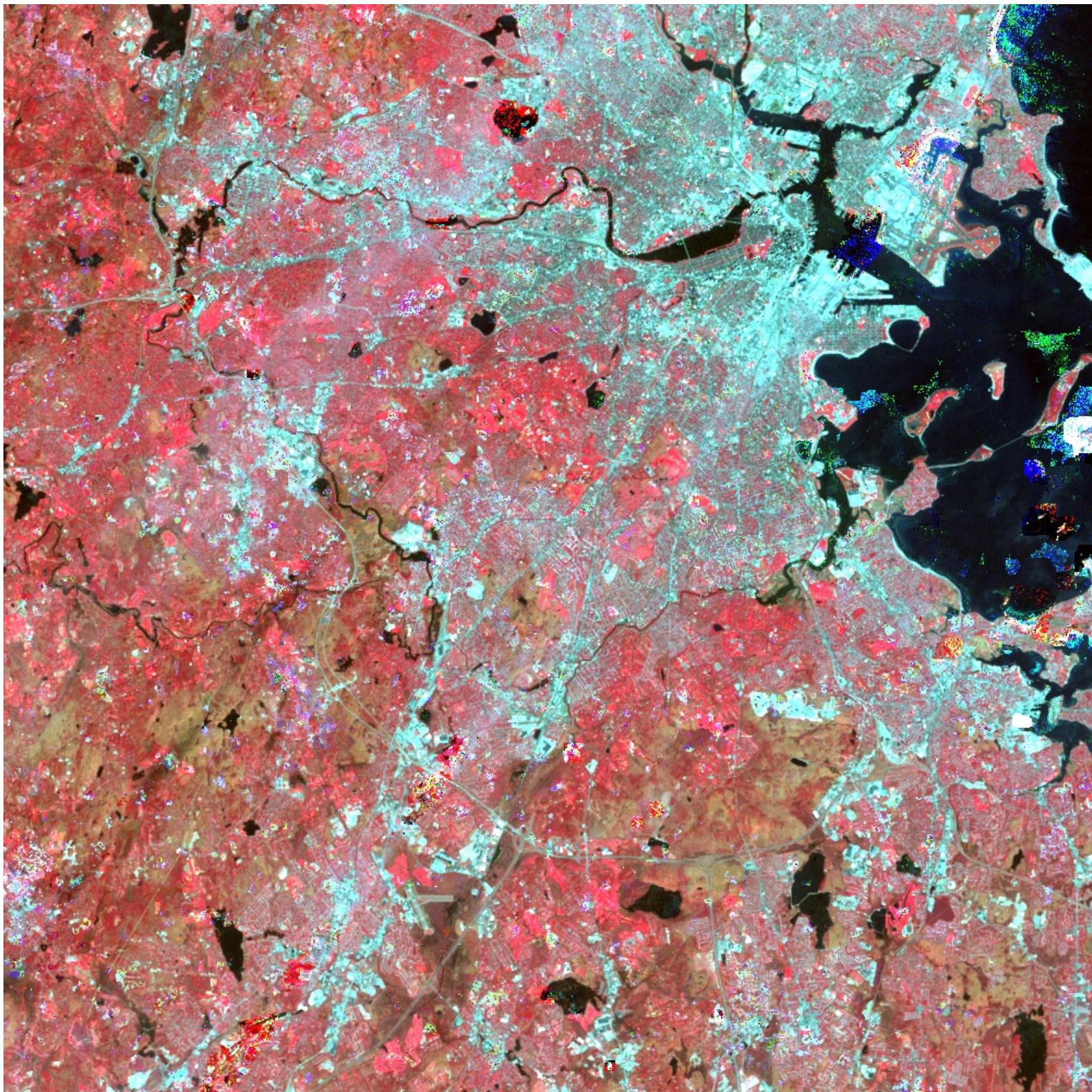


Synthetic image example, May 6 2000

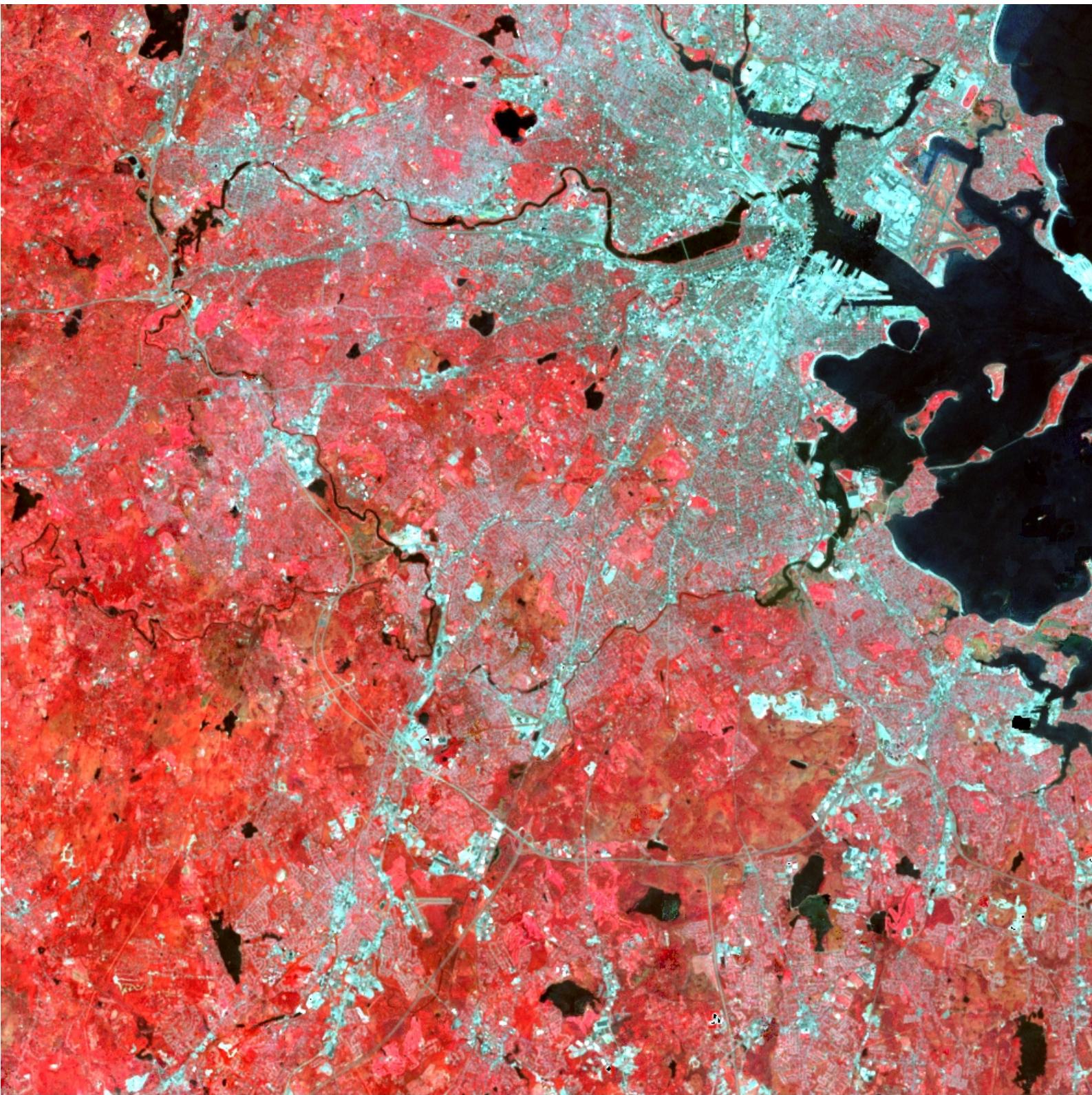
Original image (432)

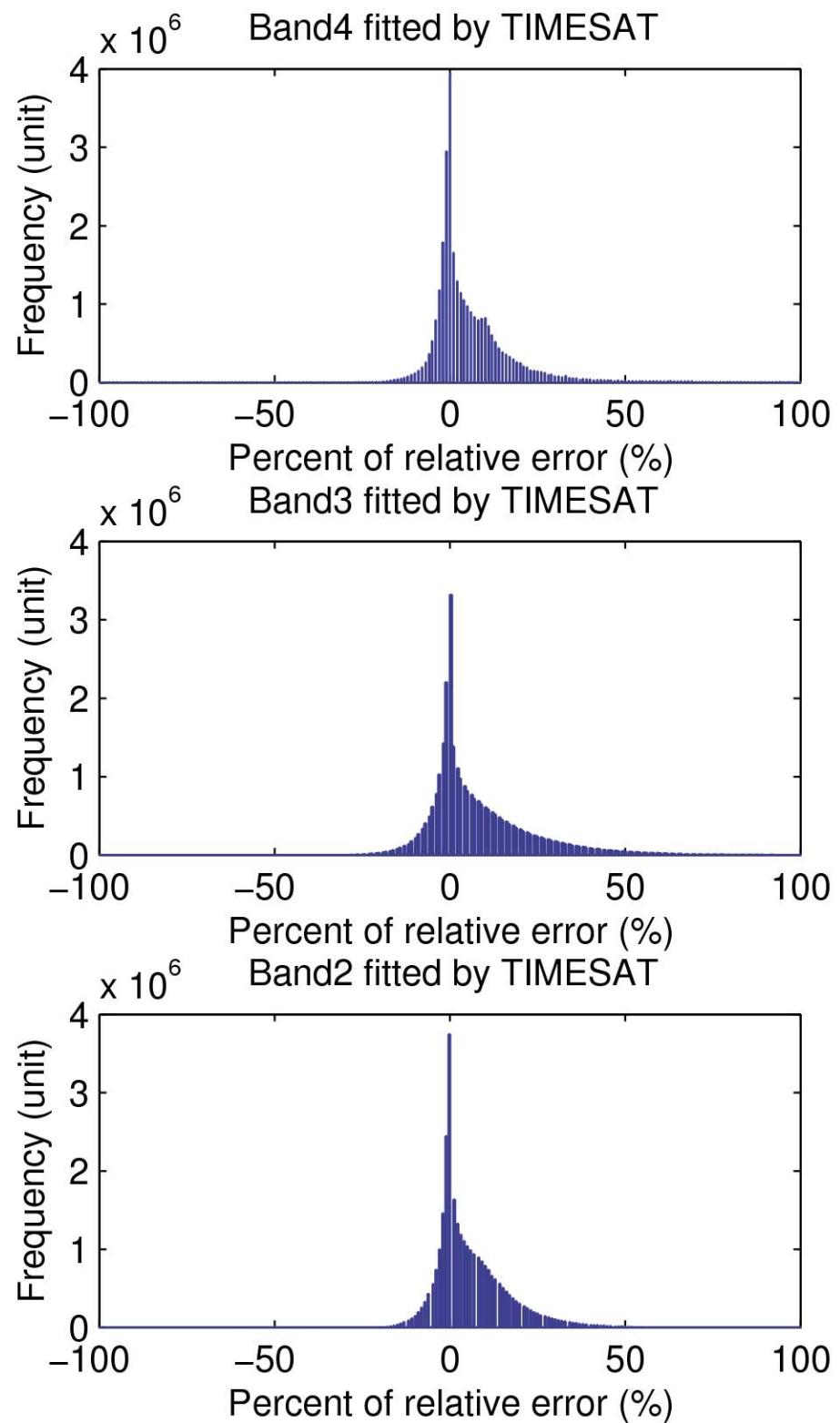
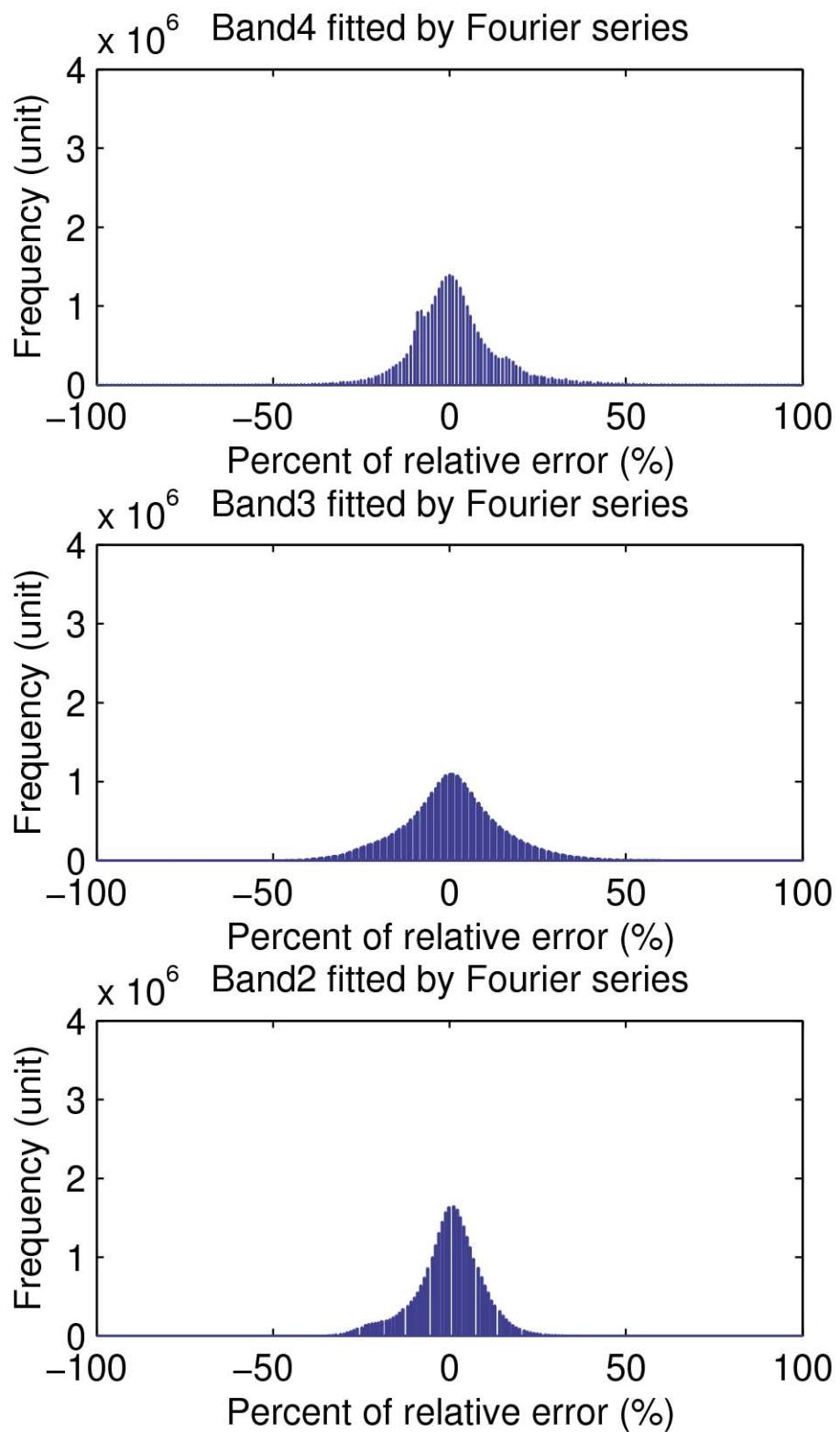


TIMESAT (432)



Fourier (432)

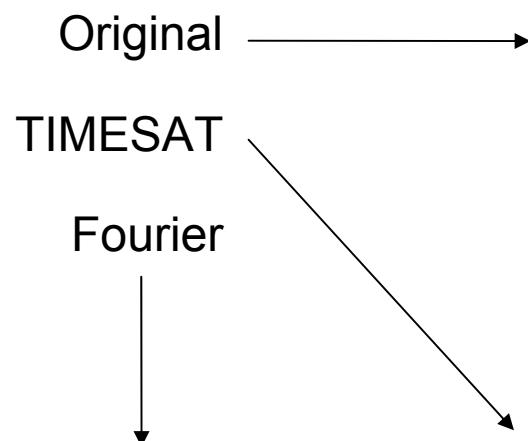




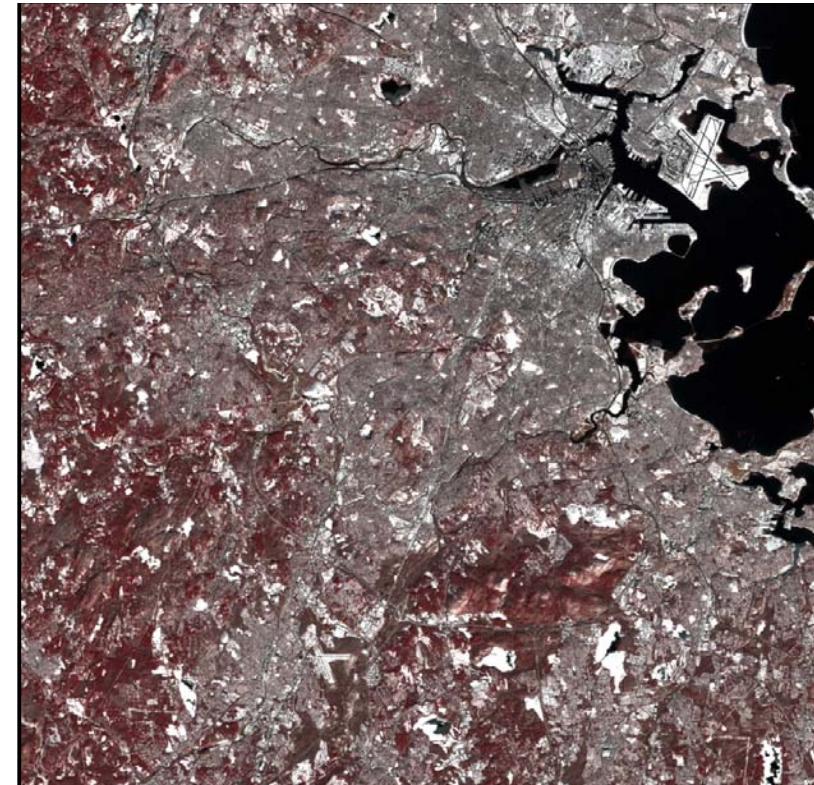
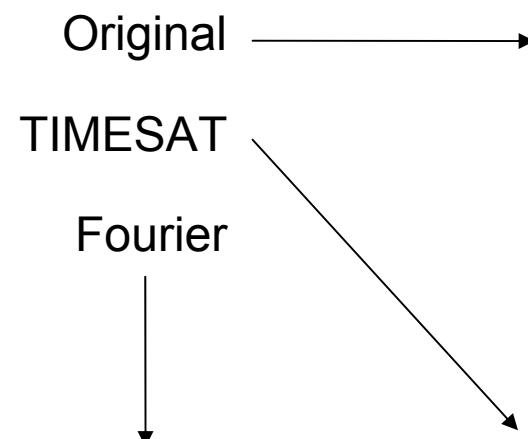


Original and synthetic images, 2002

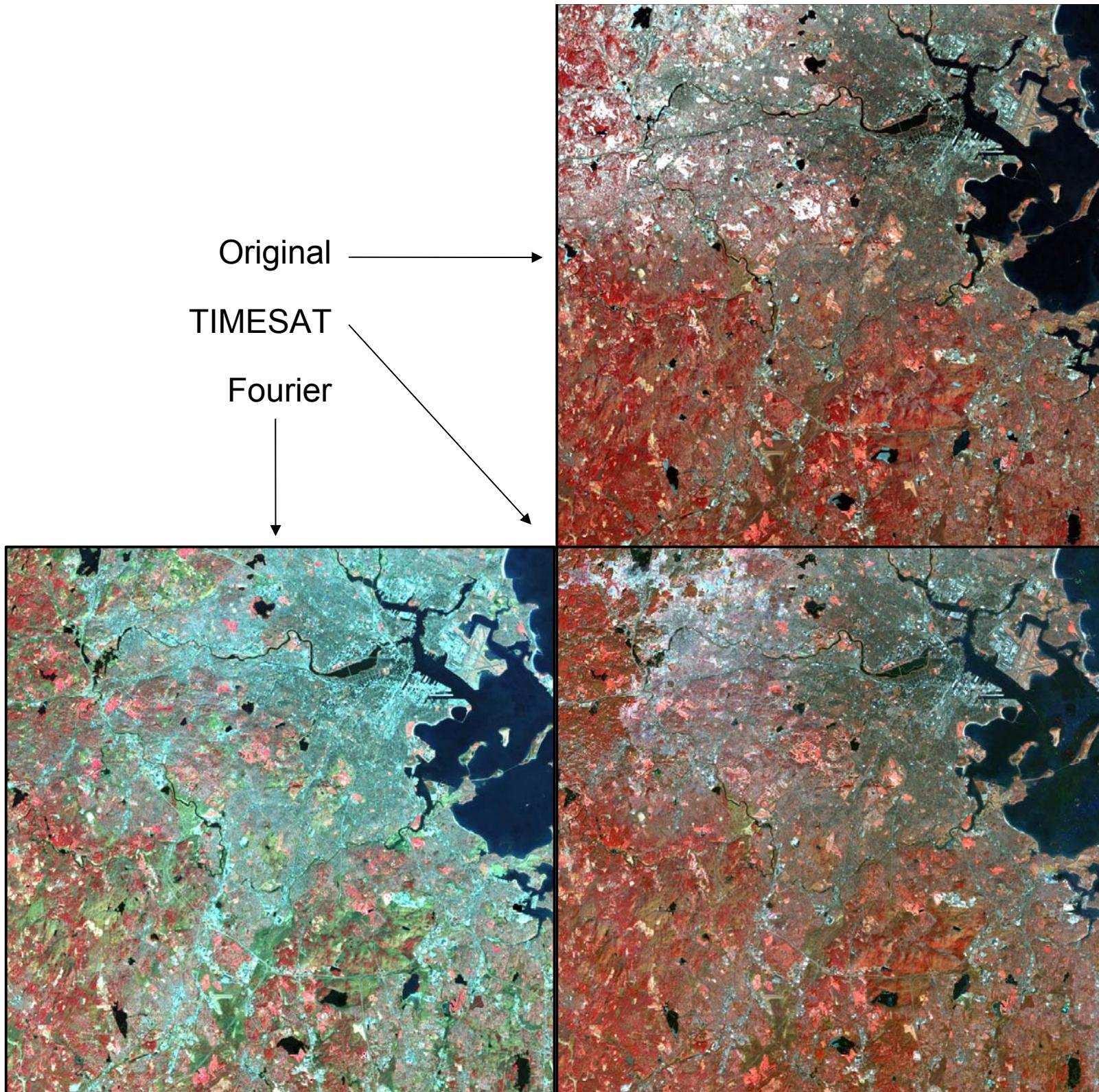
4 Jan, 2002



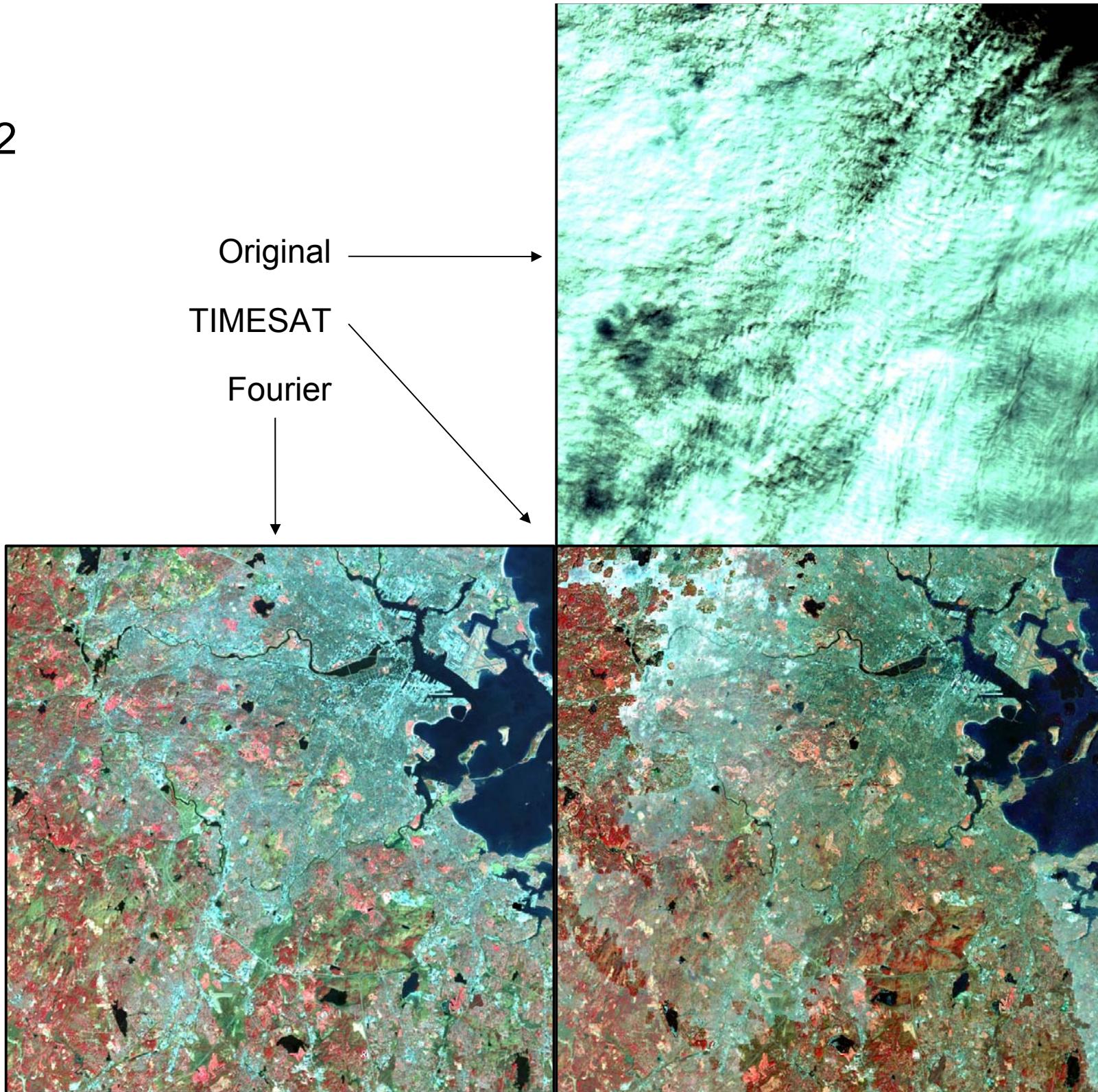
20 Jan, 2002



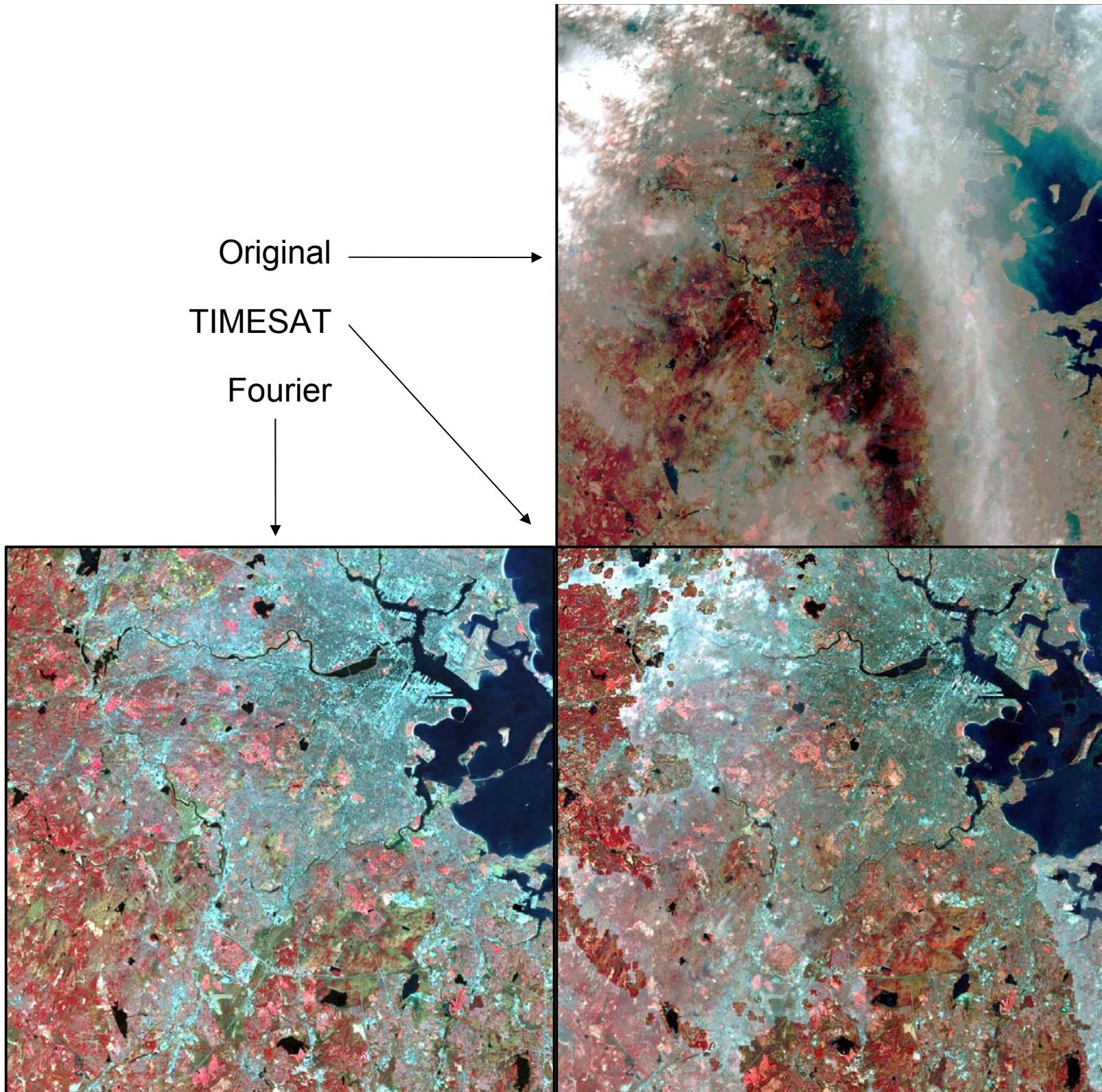
5 Feb, 2002



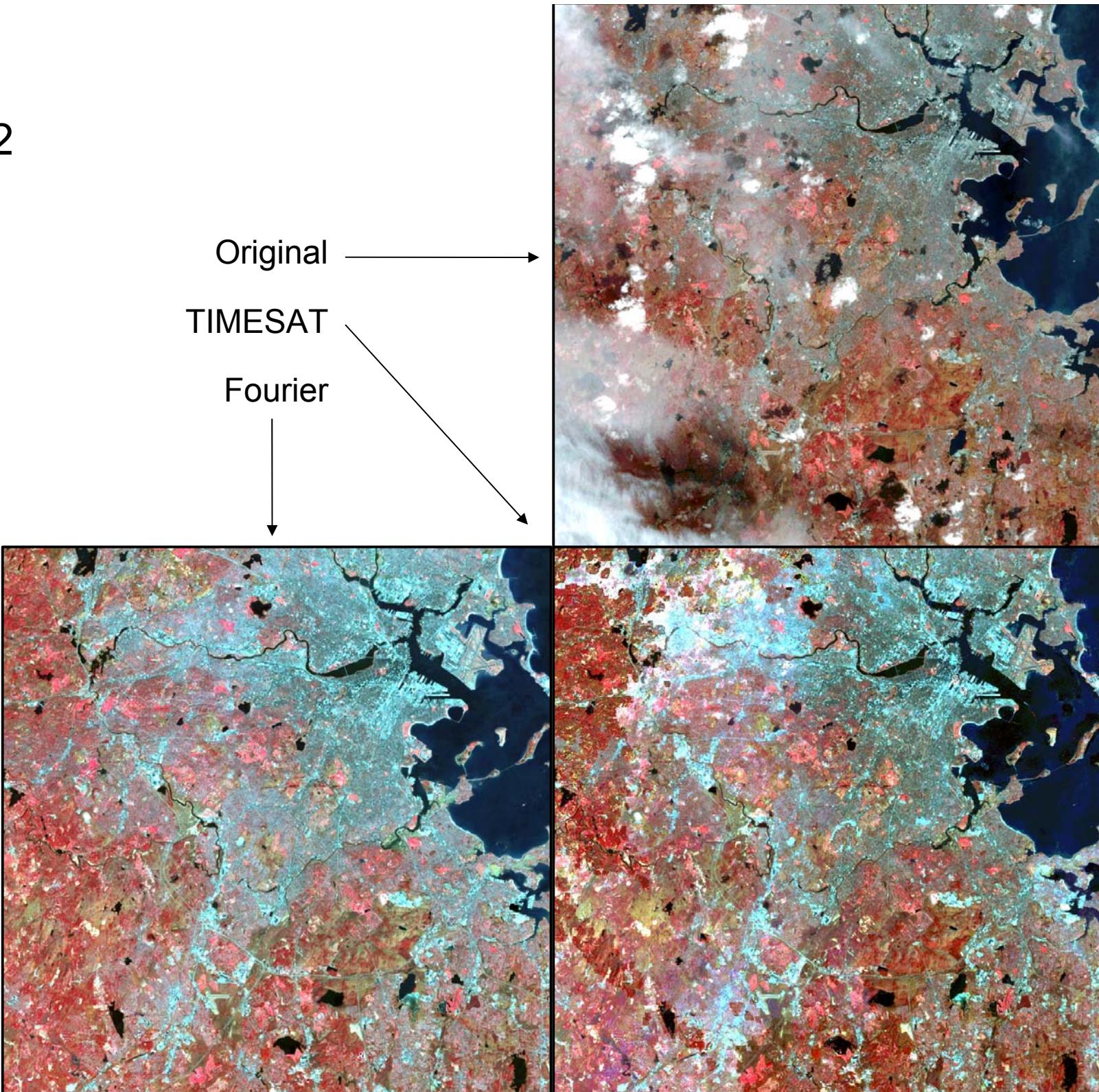
21 Feb, 2002



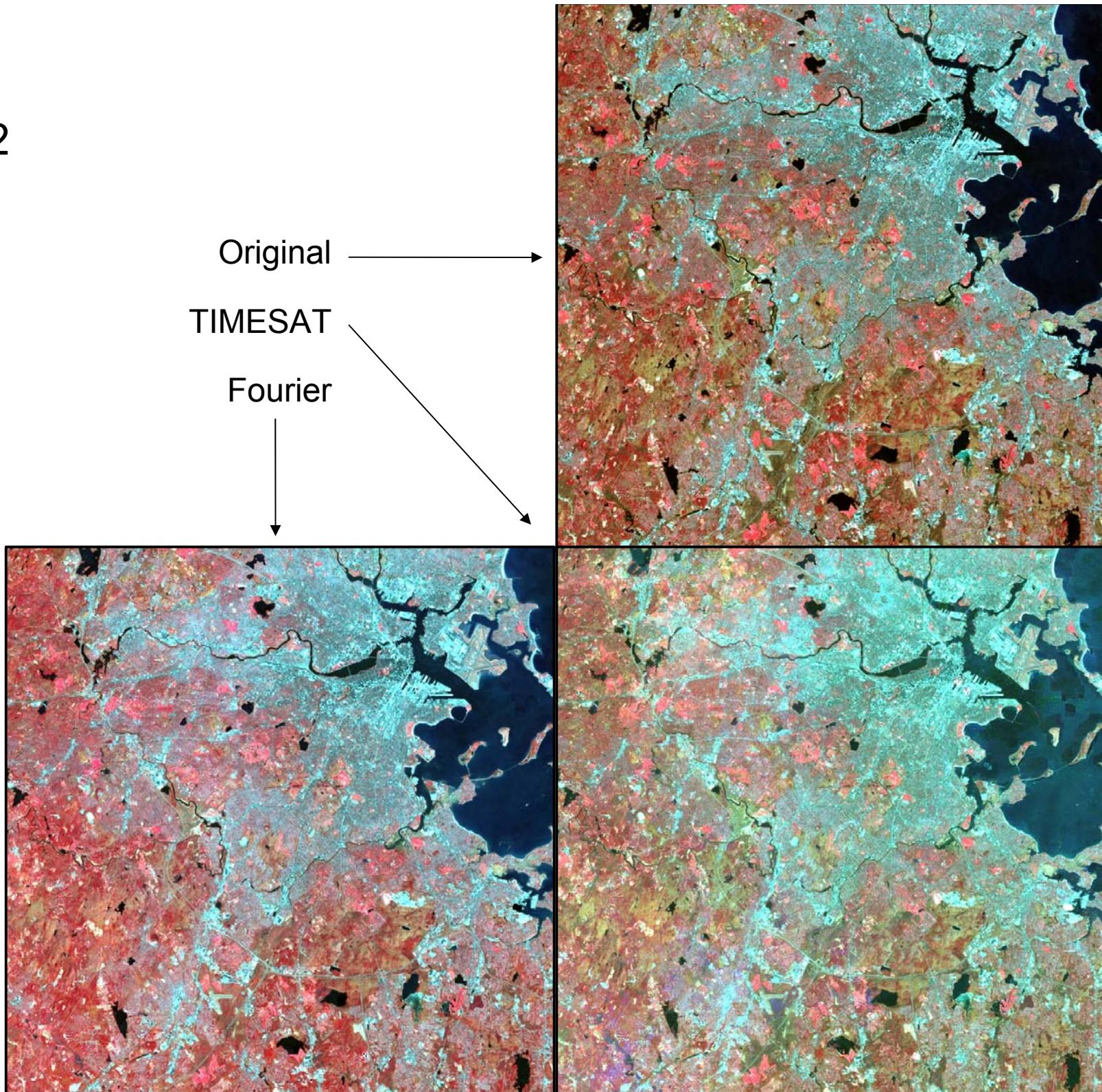
9 Mar, 2002



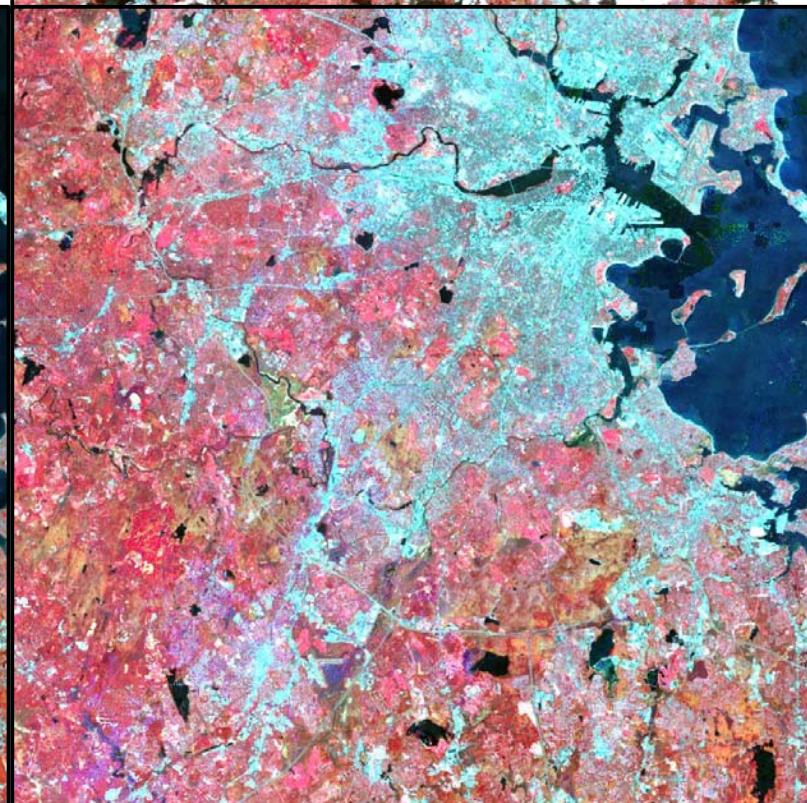
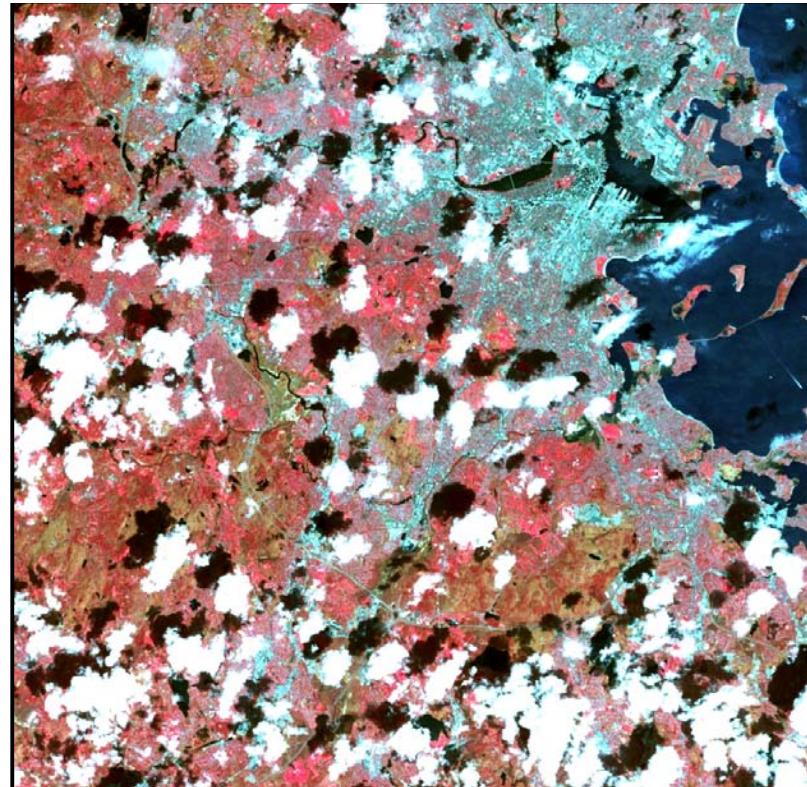
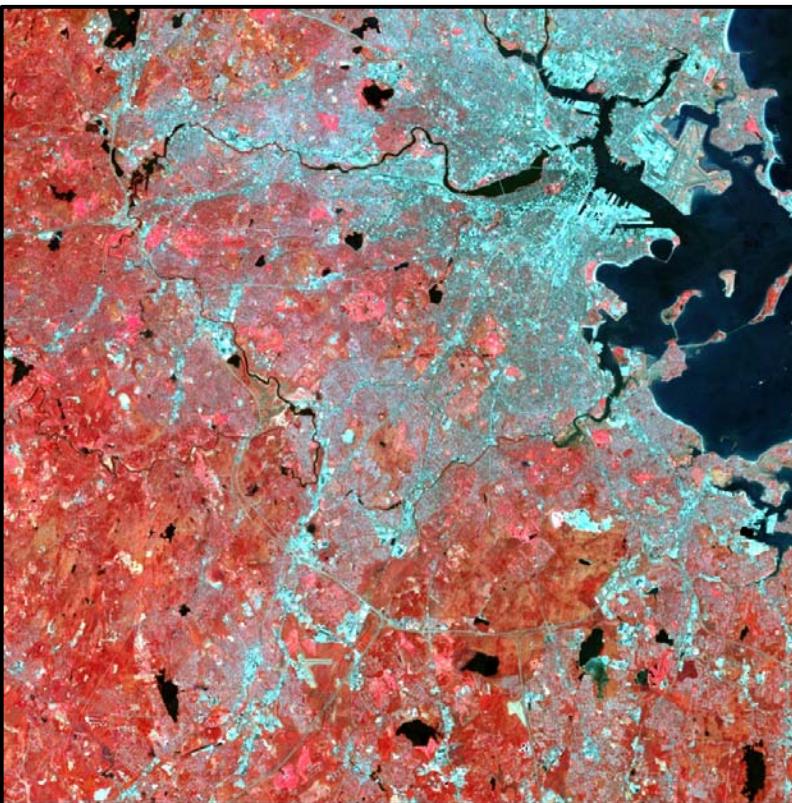
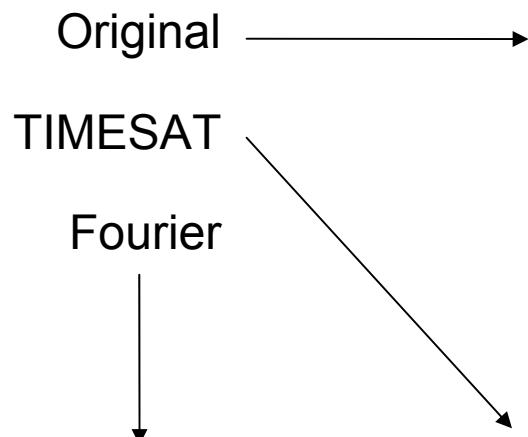
25 Mar, 2002



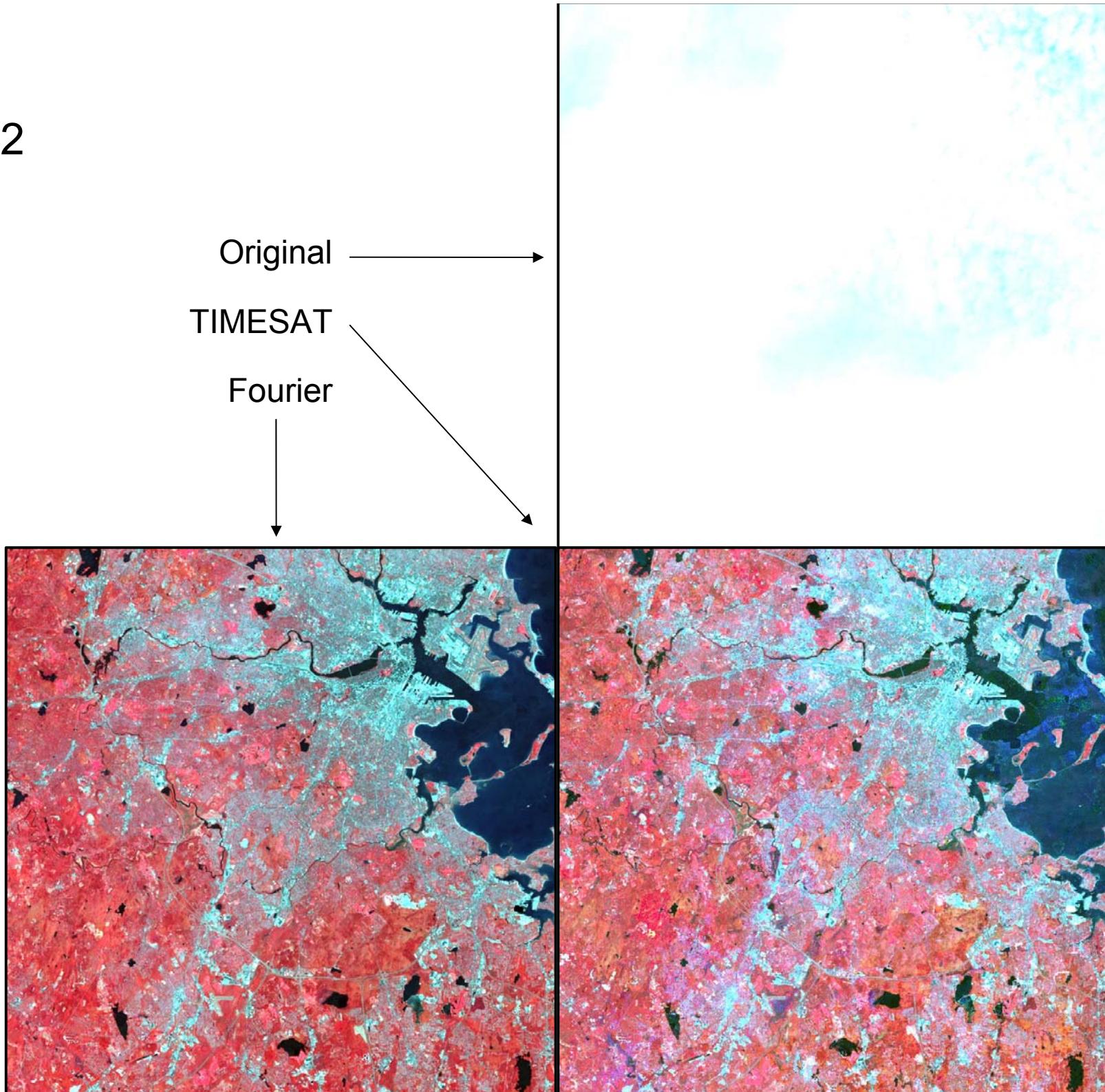
10 Apr, 2002



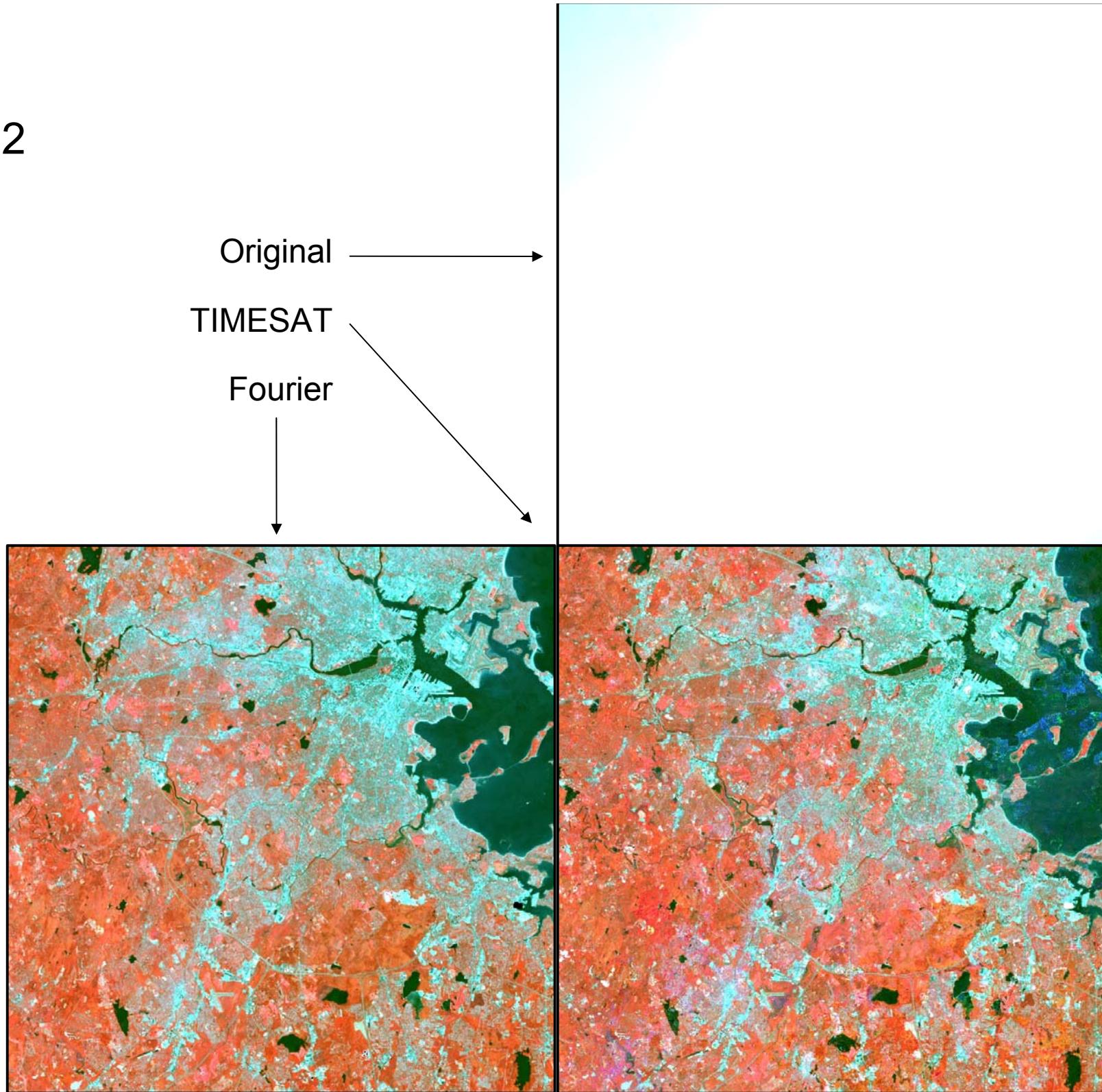
26 Apr, 2002



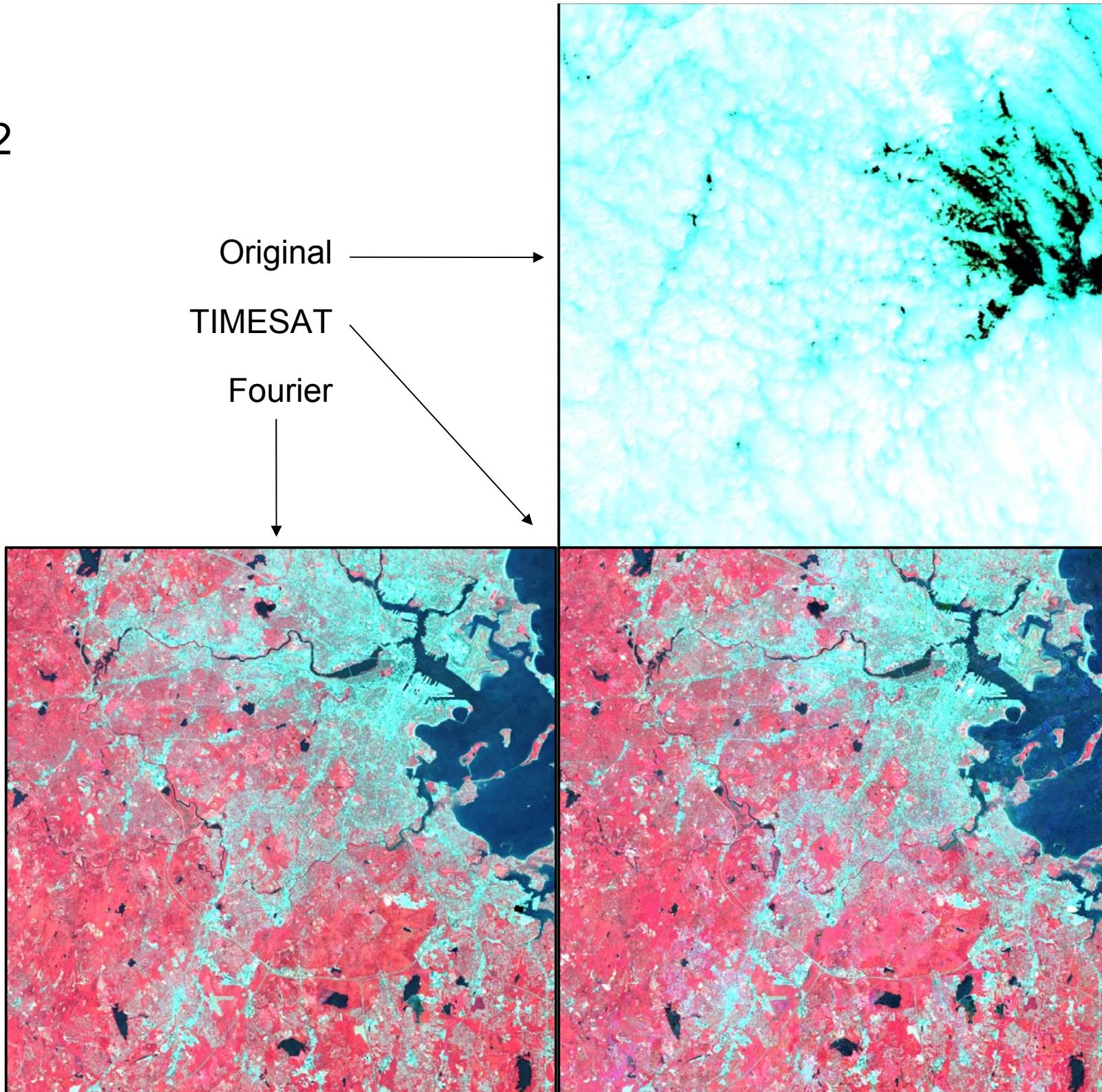
12 May, 2002



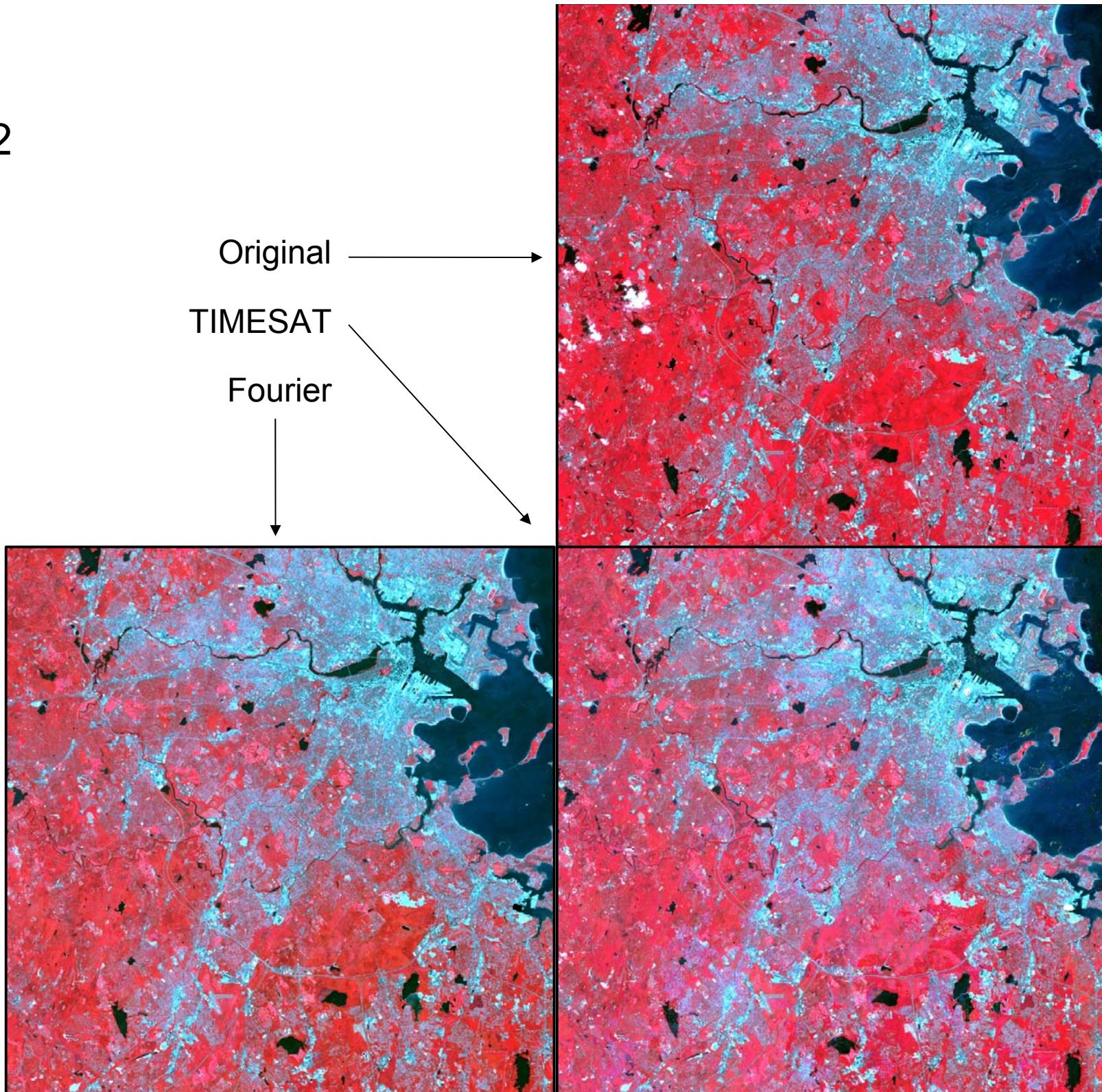
28 May, 2002



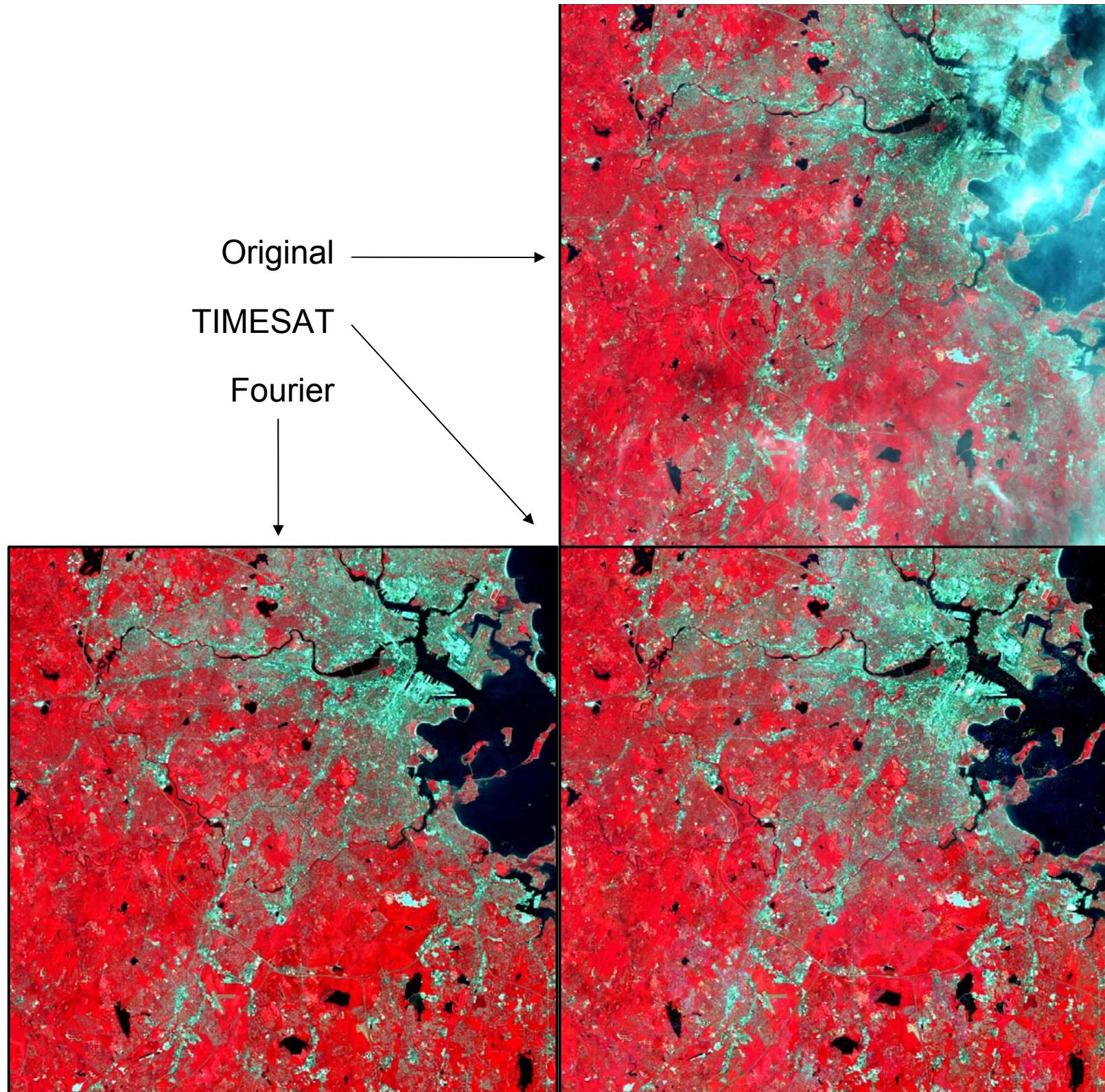
13 Jun, 2002



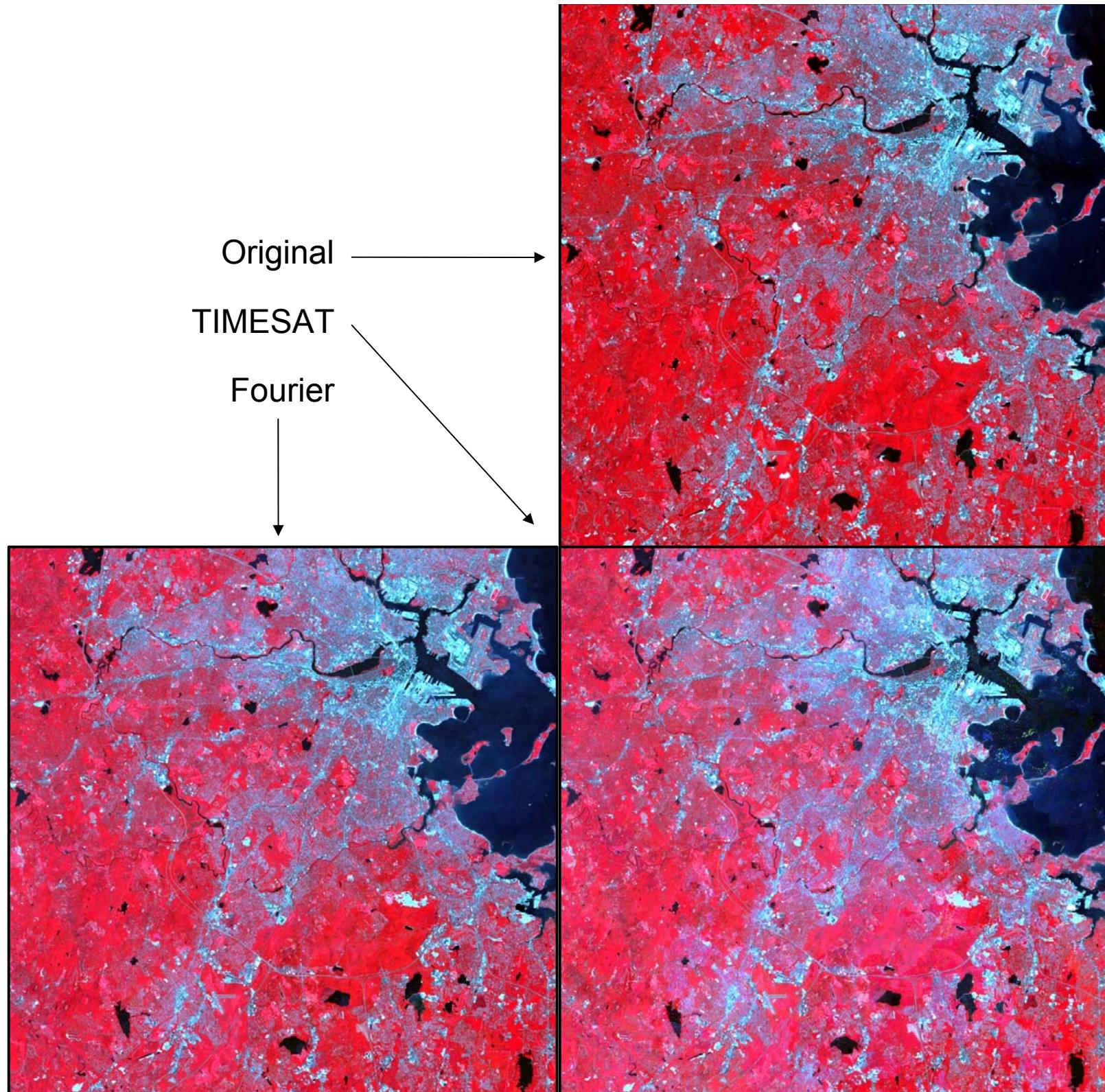
29 Jun, 2002

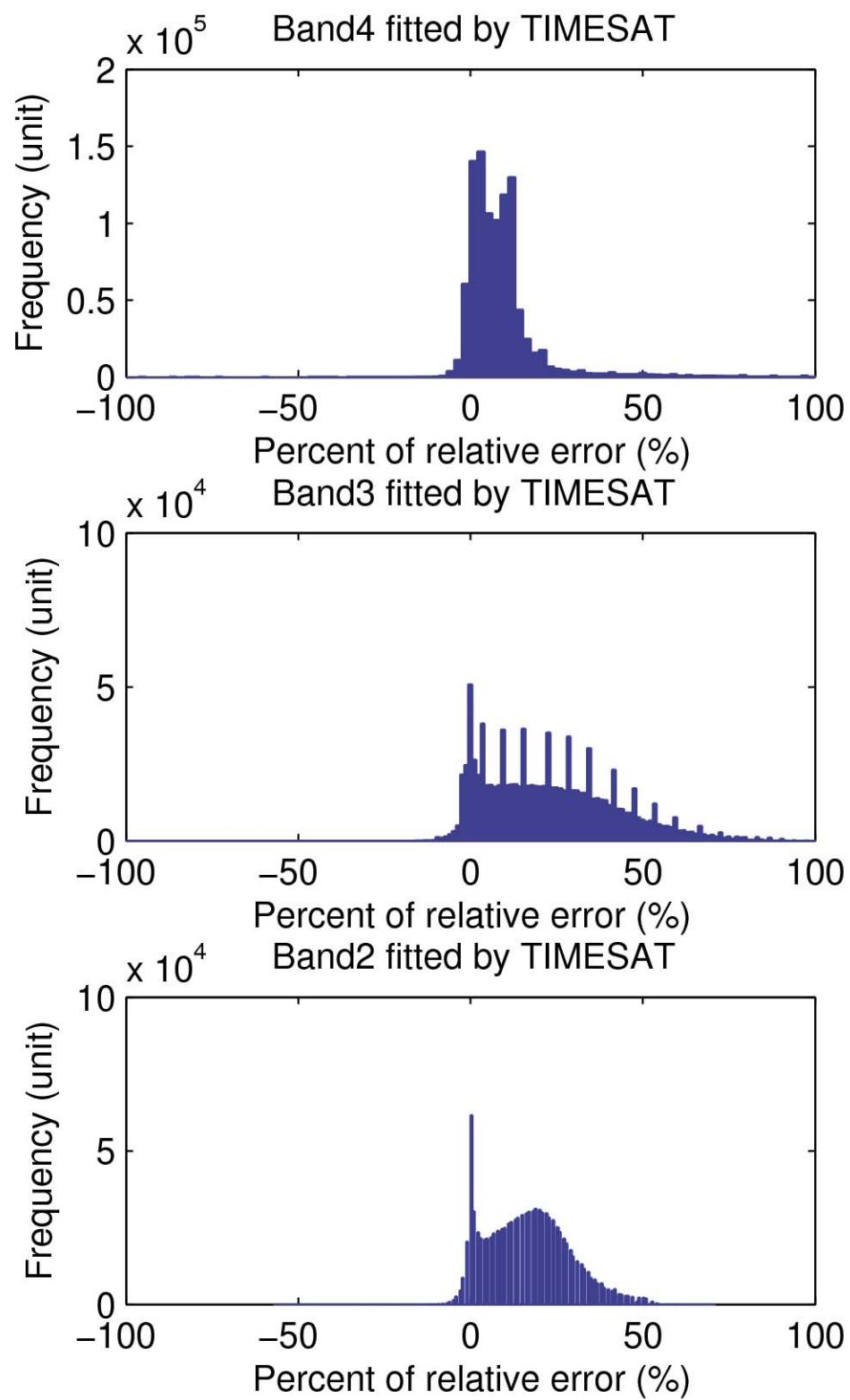
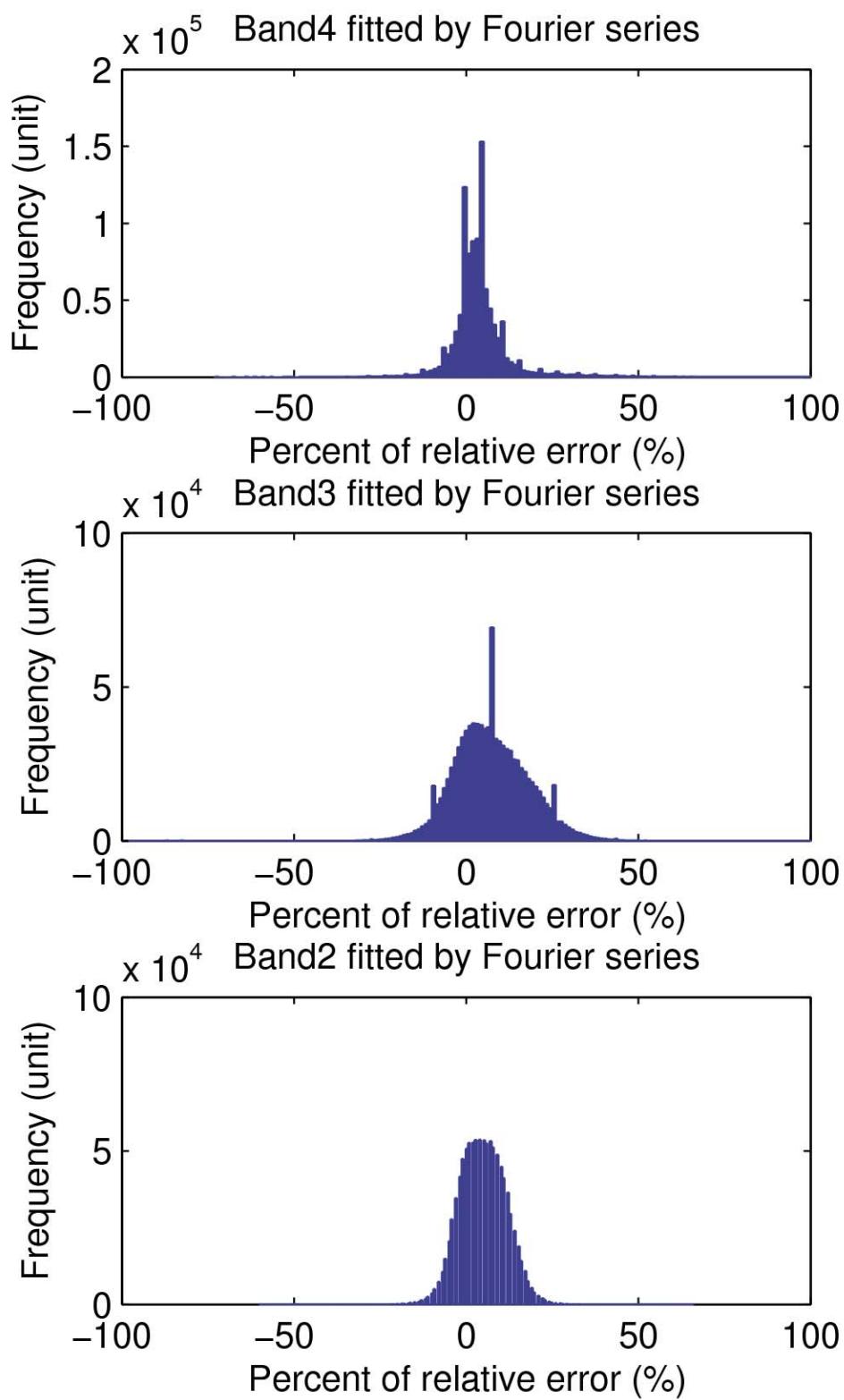


15 Jul, 2002

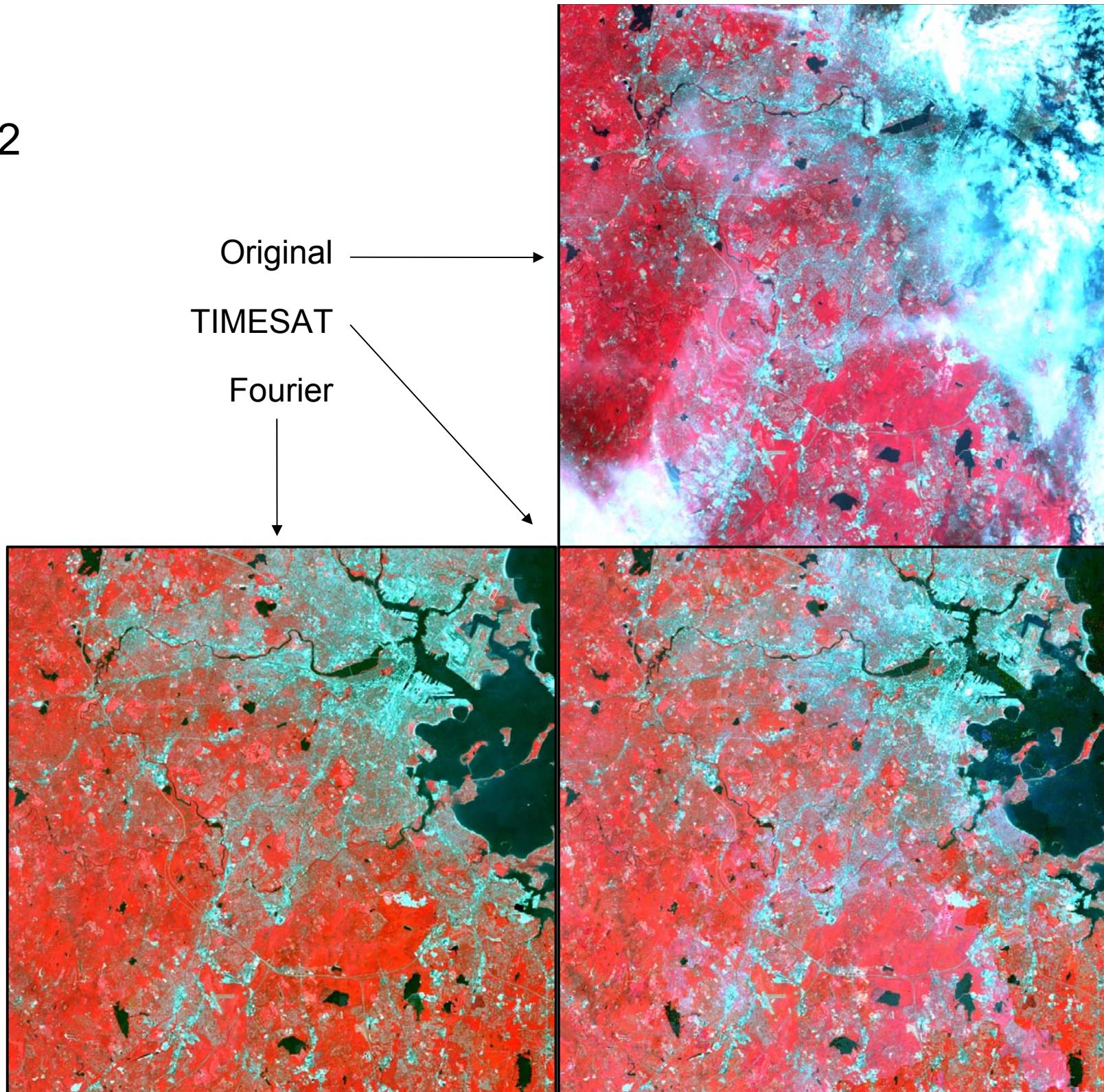


31 Jul, 2002

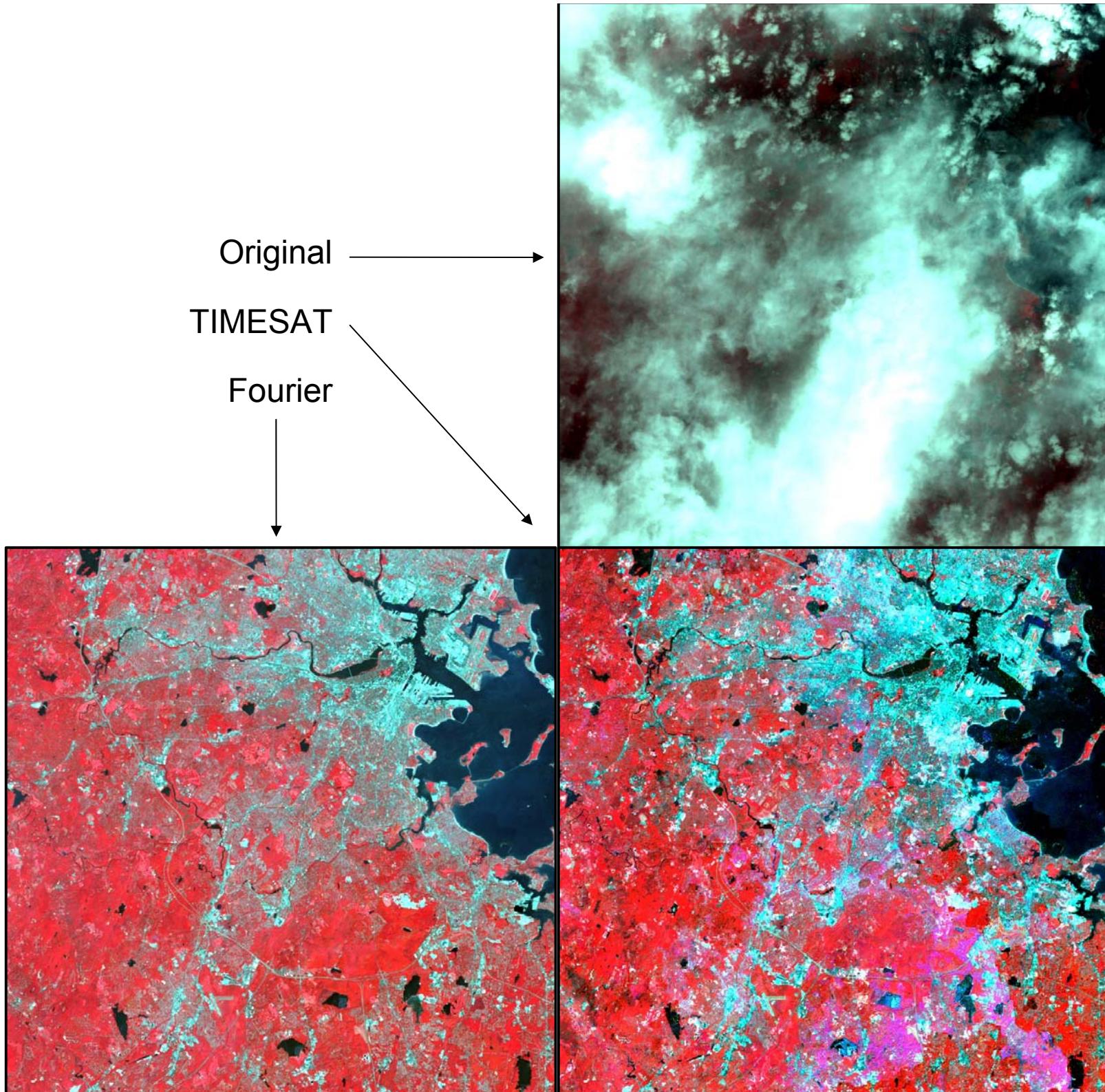




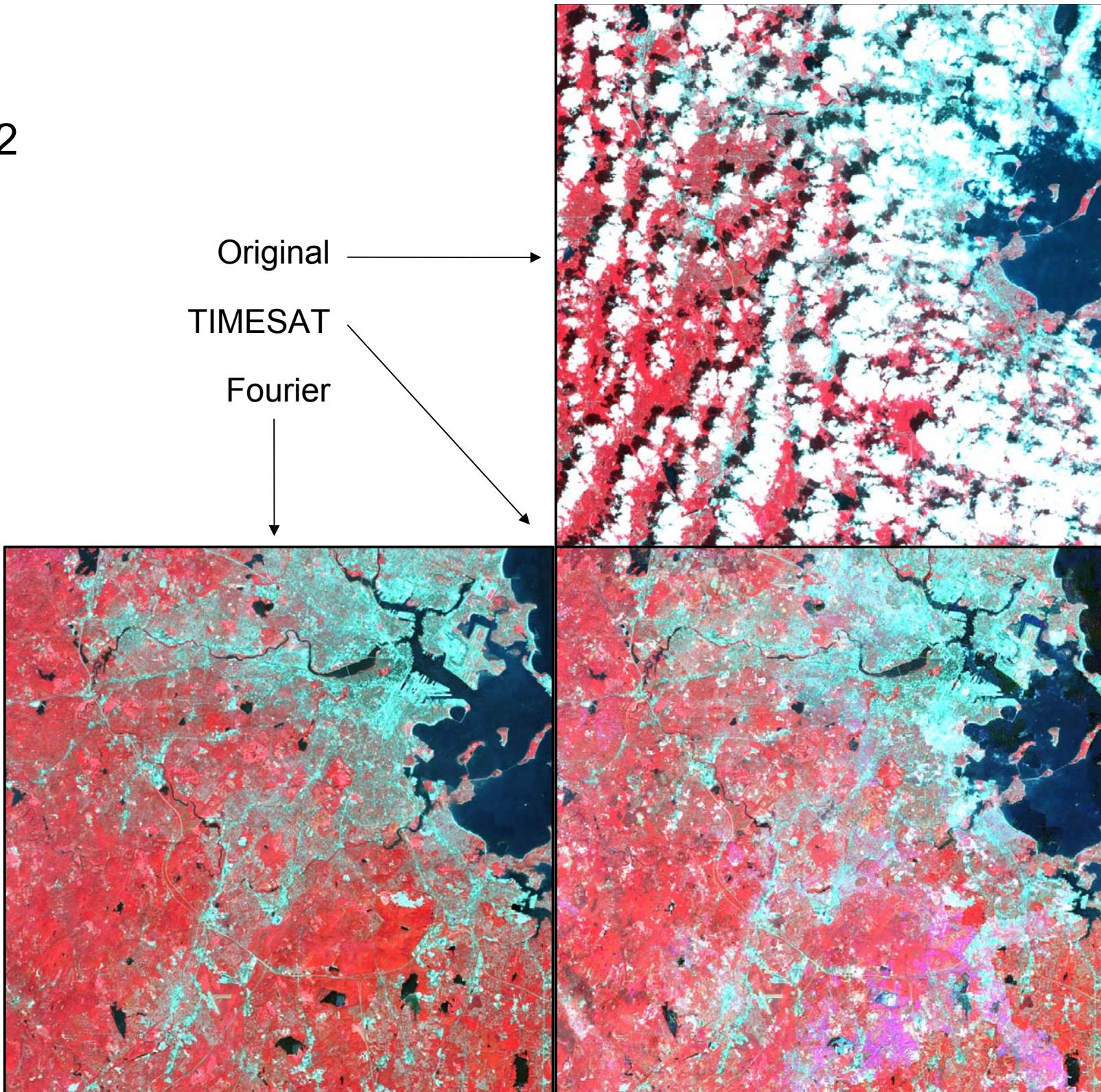
16 Aug, 2002



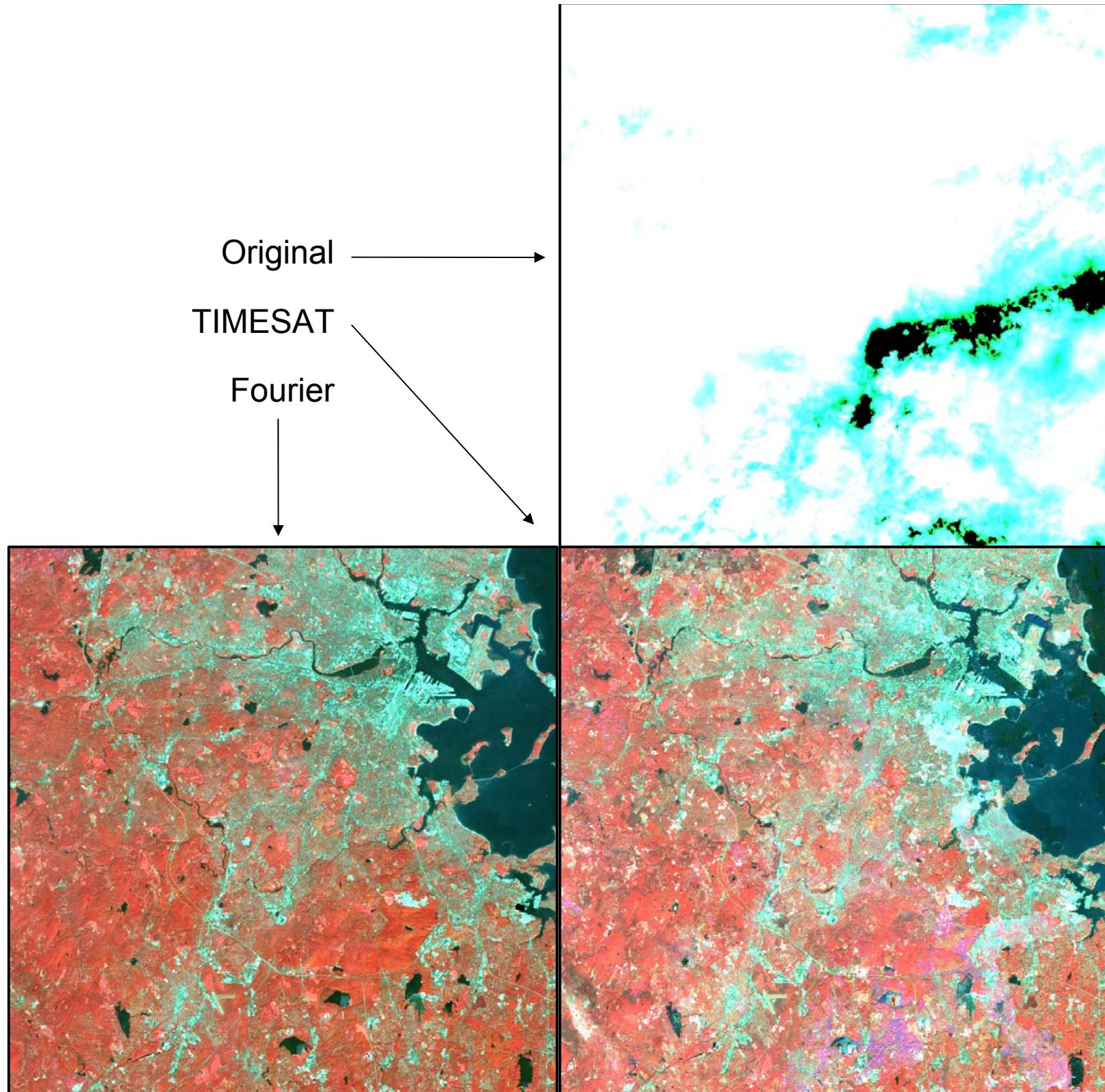
1 Sep, 2002



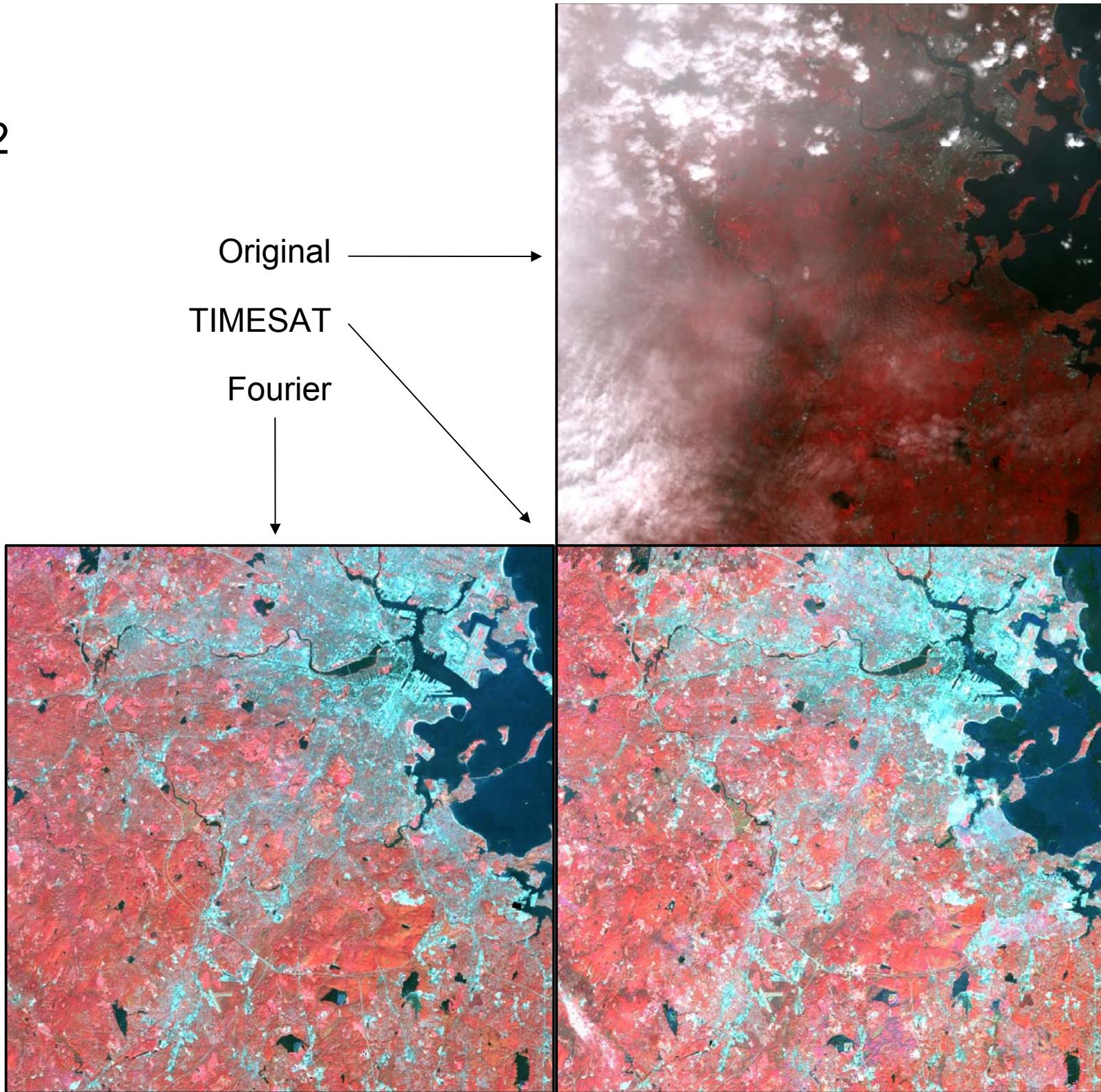
17 Sep, 2002



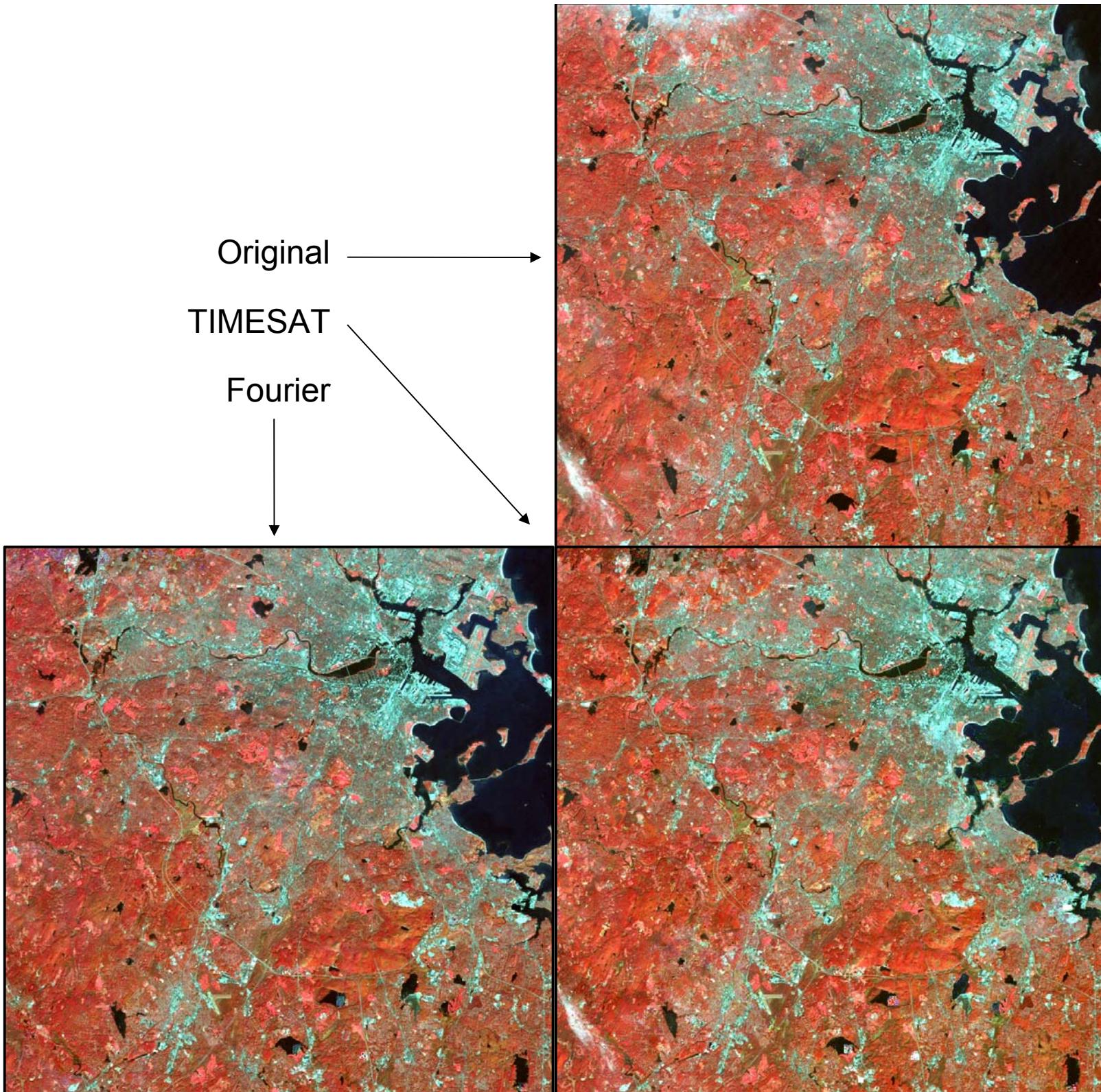
3 Oct, 2002



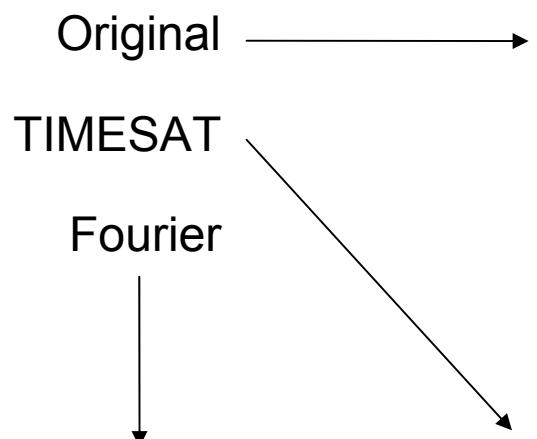
19 Oct, 2002

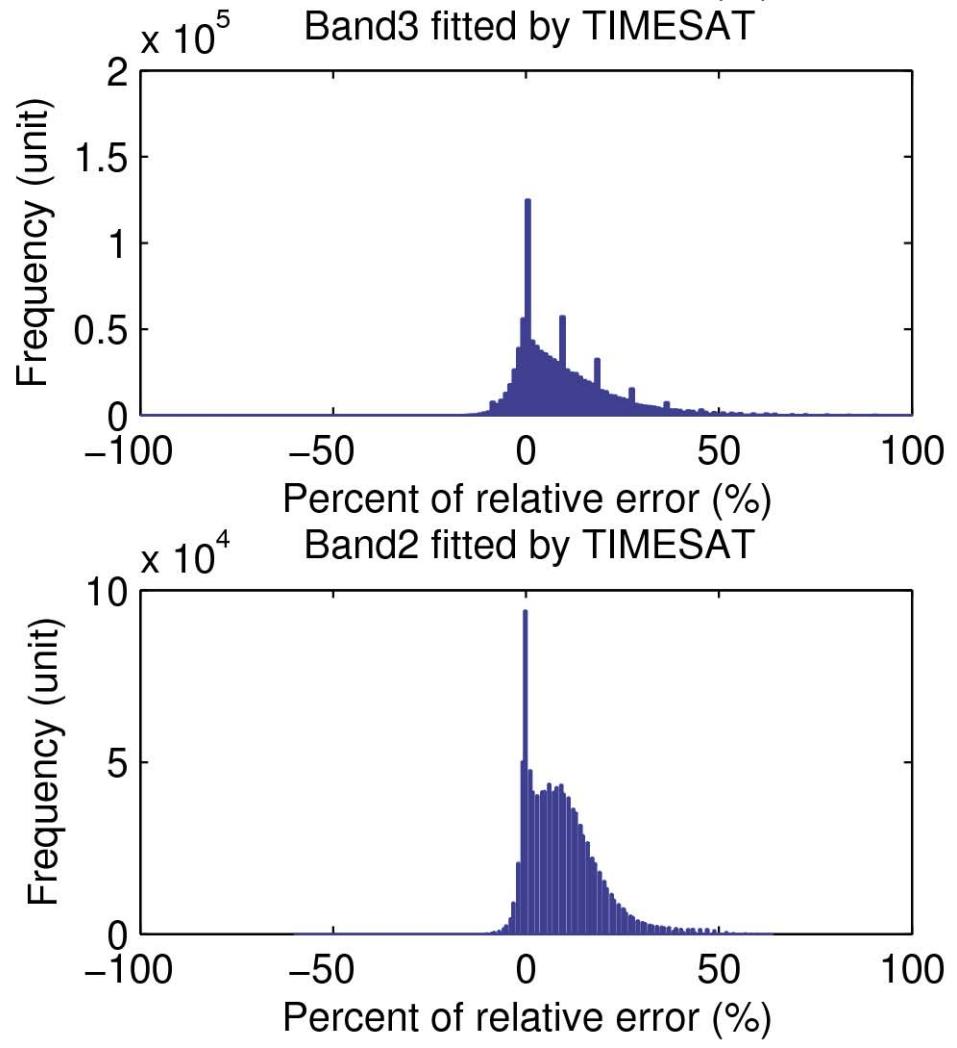
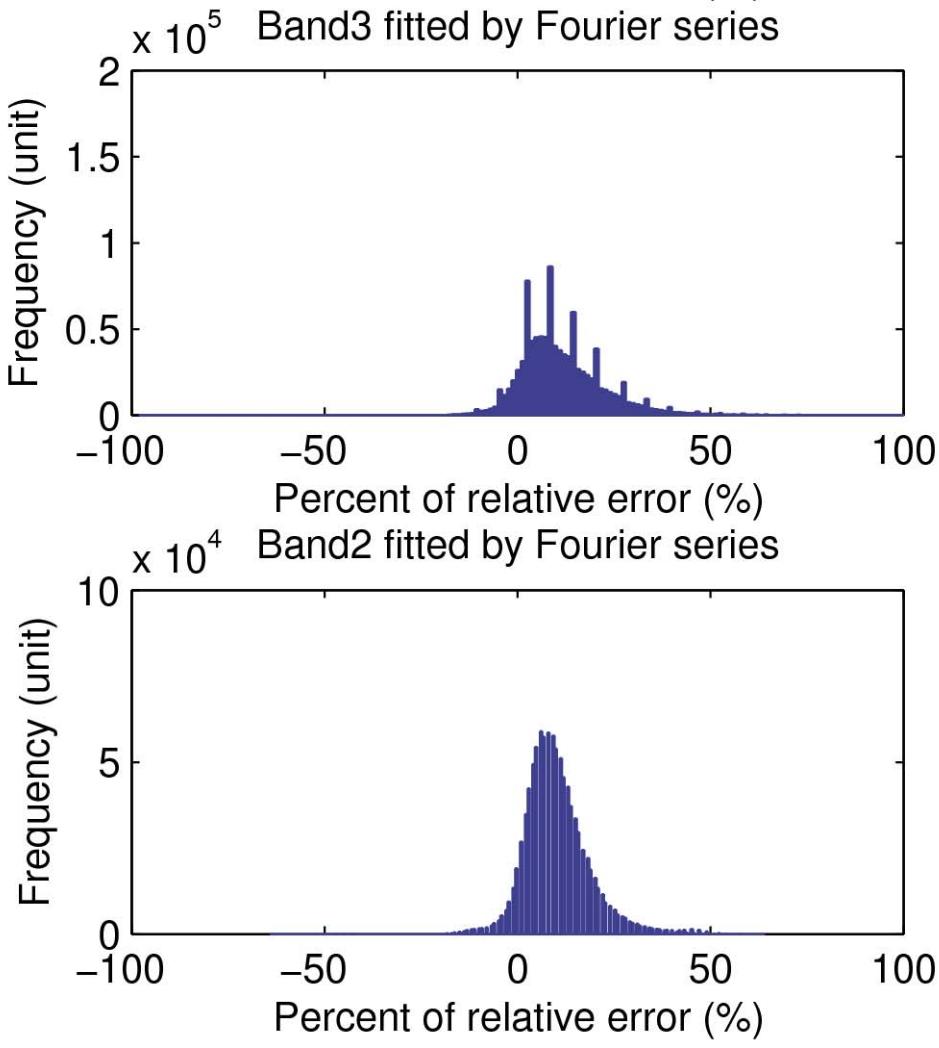
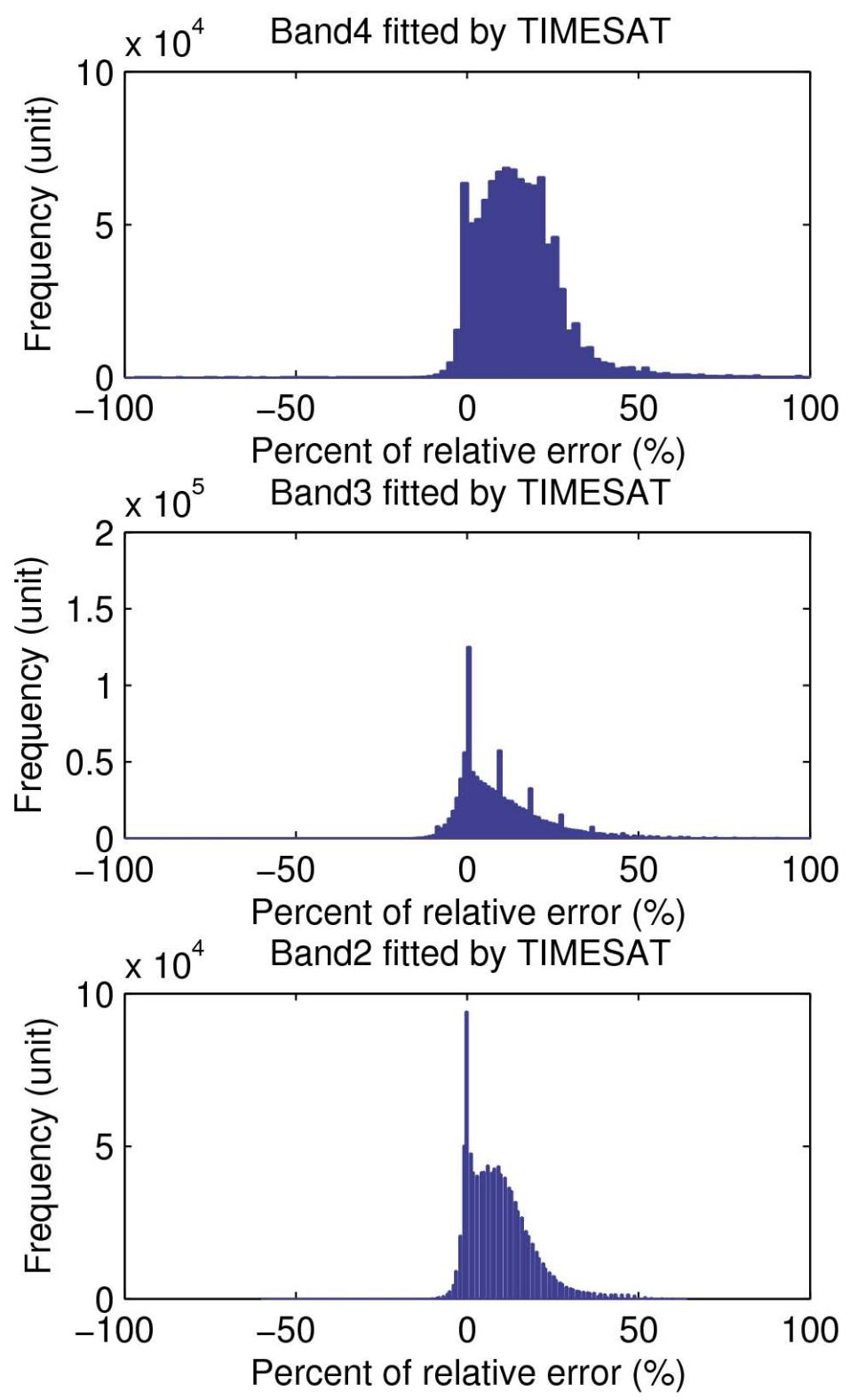
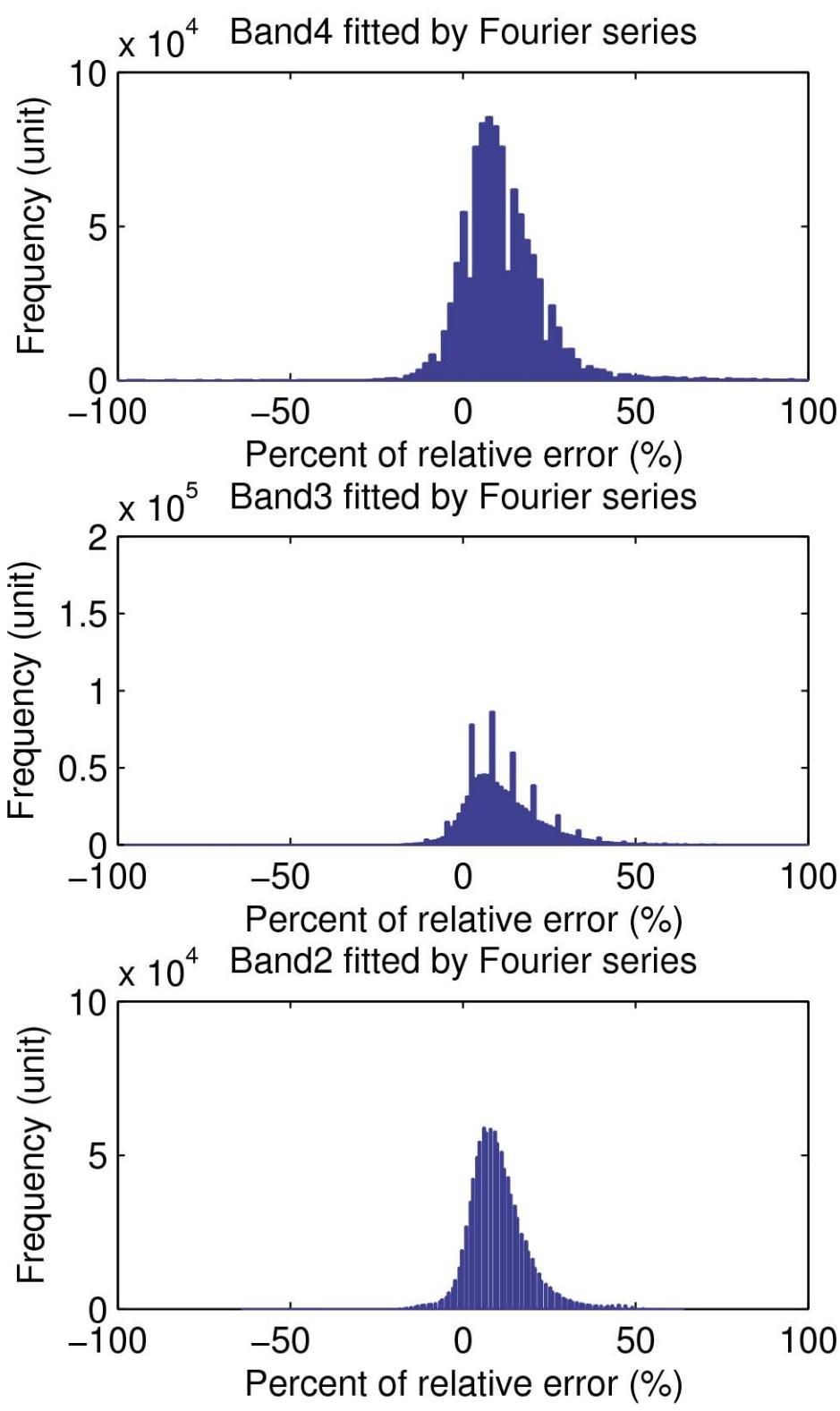


4 Nov, 2002

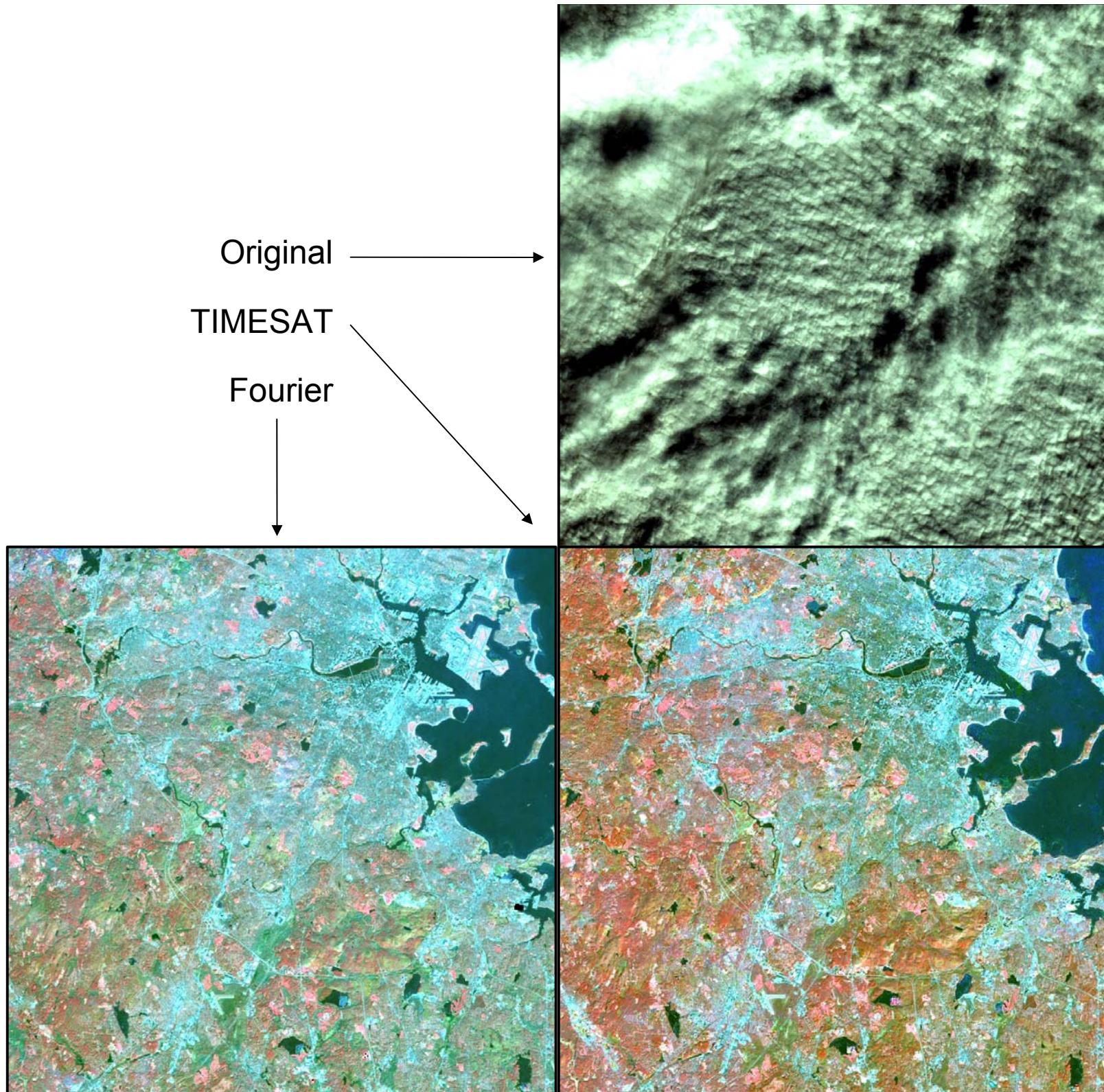


20 Nov, 2002





6 Dec, 2002



22 Dec, 2002

