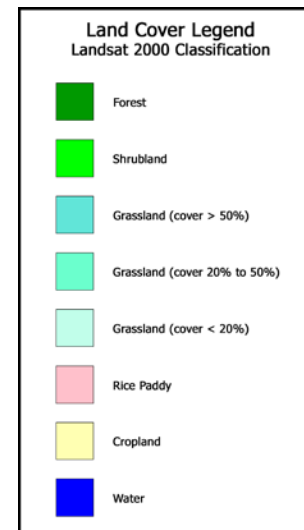
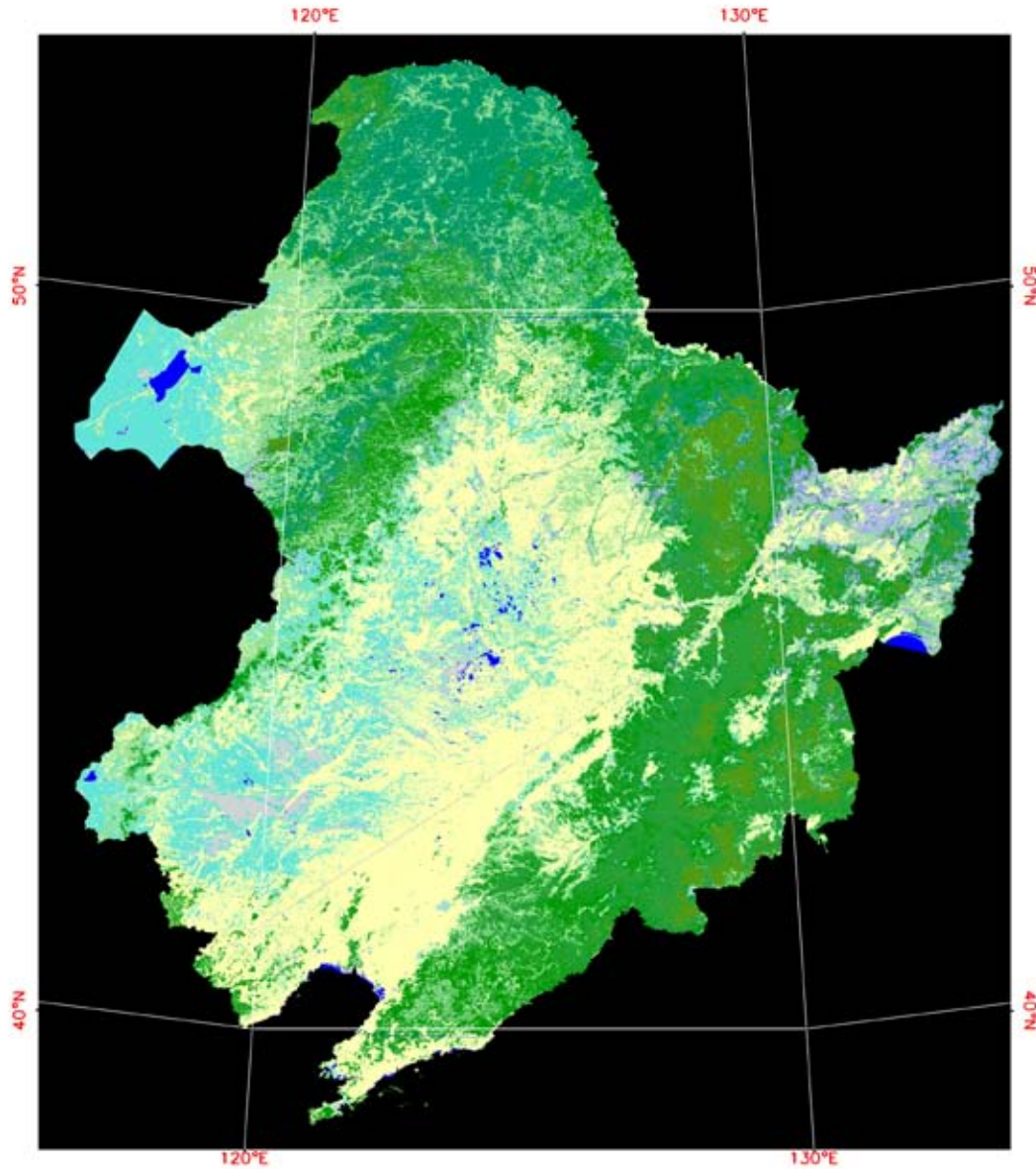


Land use map
From L-7 ETM+
Imagery in 2000

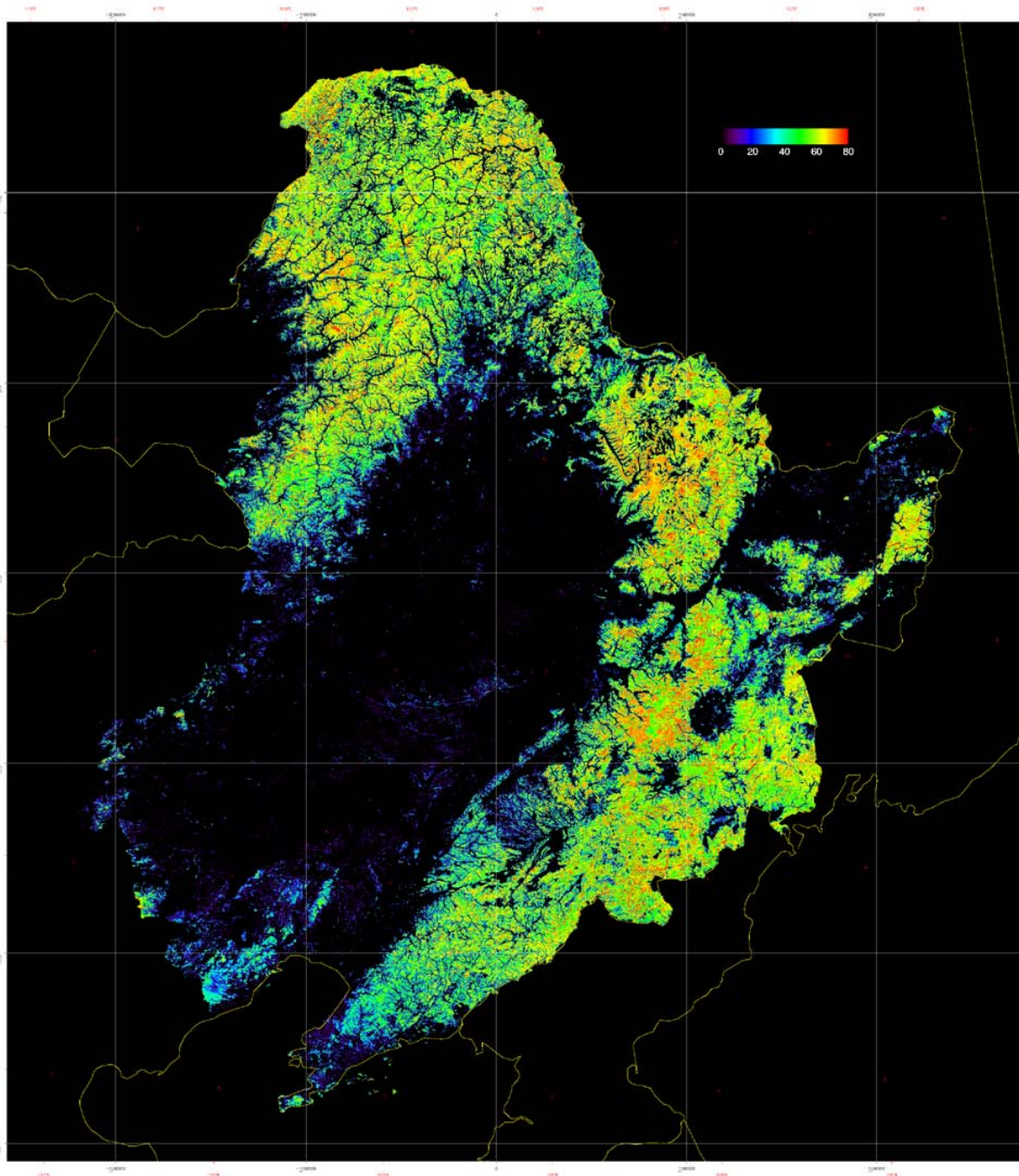




Forest map from
MODIS 500m
16-day NDVI
Composite Data
in 2000-2001



Forest Coverage Map from MODIS Data



Forest coverage using
multiregression model
of MODIS 500m 16-day
composite data:
 $F = -0.06 - 0.55 \text{ MIR} + 0.14 \text{ NDVI}$

The forest coverage was also
estimated from aggregation of
30m land use map from L-7
ETM+ imagery.

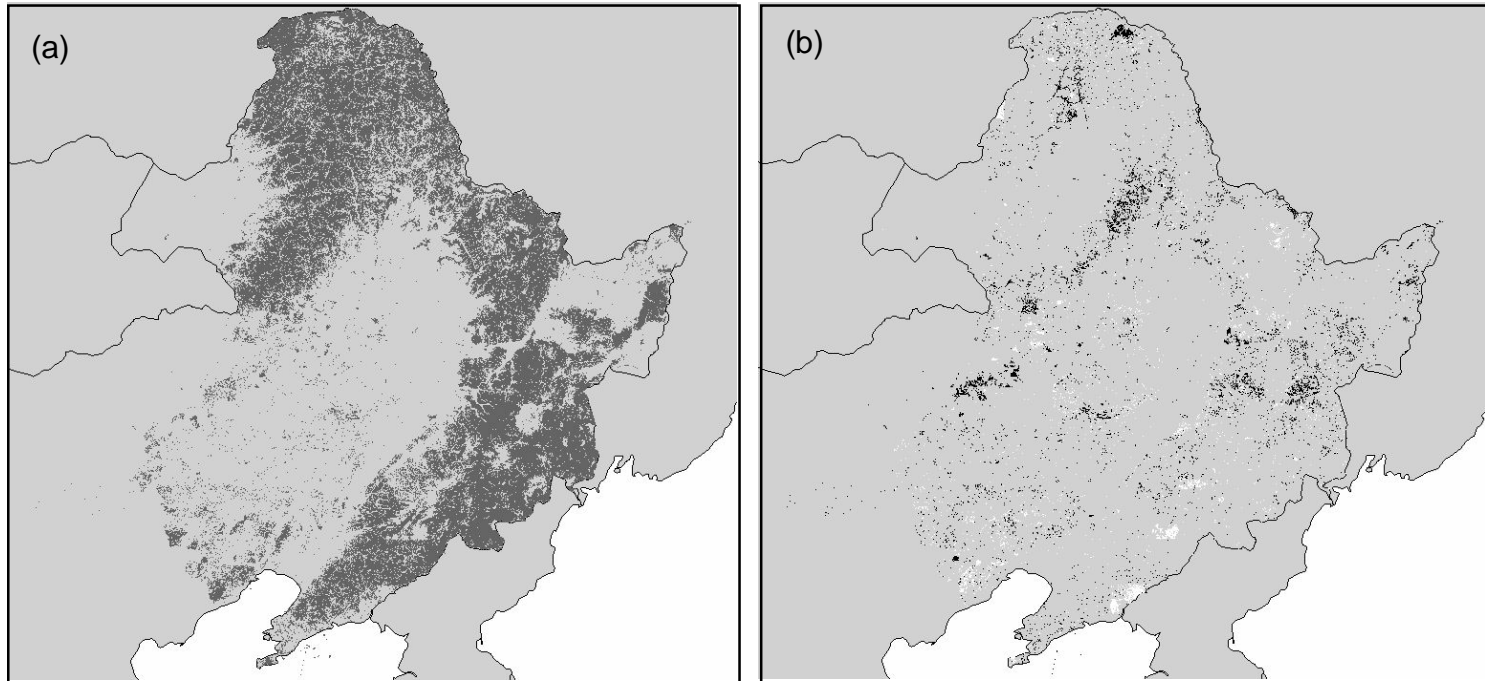
The comparisons of 2400 random
samples (800 each at north, south
and center regions) gives:

$$F_{\text{etm}} = 0.04 + 1.16 F_{\text{modis}} \\ R^2 = 0.94$$

where F_{etm} and F_{modis} are
forest coverage from ETM+
and MODIS respectively.

The F_{etm} tends to be high because
ETM+ land use map was manually
interpreted and every forest pixel was
assumed a 100% coverage.

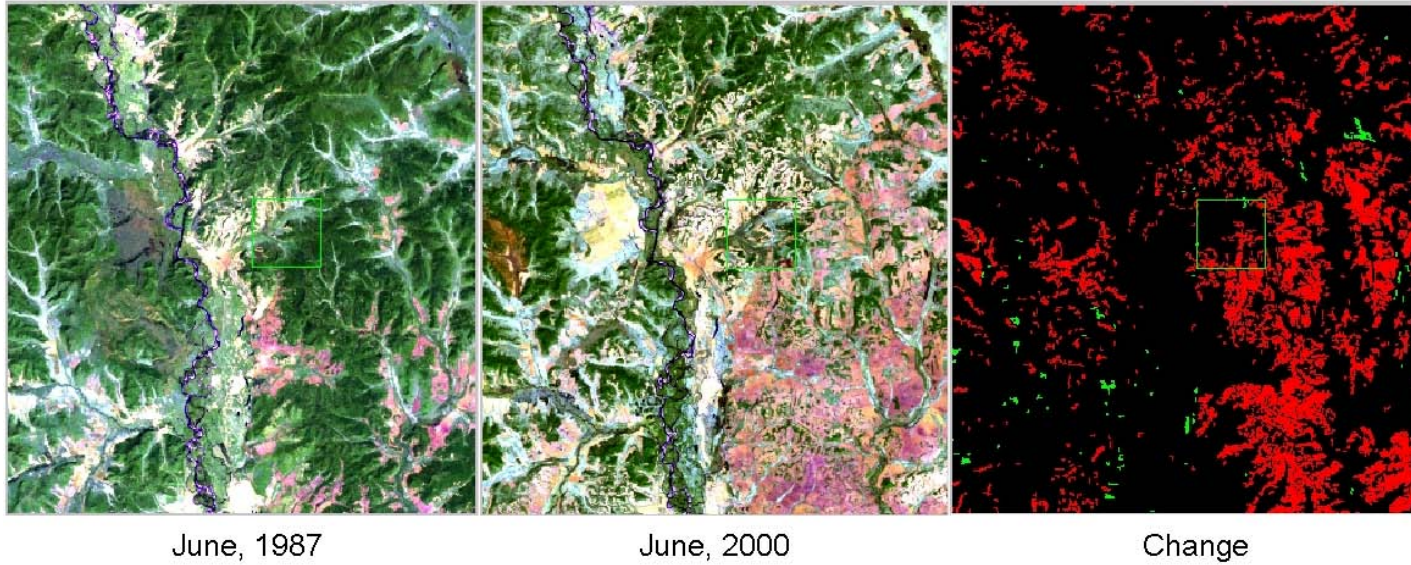
The colors from black to red
represent forest coverage of
0-80%



(a) Extent of NE China forests (dark) in 1990 as mapped from Landsat-5 TM data;
(b) forest loss (black) and gain (white) calculated by comparing 1990 and 2000 forest extent maps. Forest loss and gain were defined as $>25\%$ change in forest cover within each 25 ha cell. The total affected forest areas are 6.0 million ha (3.4 Mha loss and 2.6 Mha gain). The net loss of forests is about 2% during 1990's.

(a) Da Xingan Ling

10 km

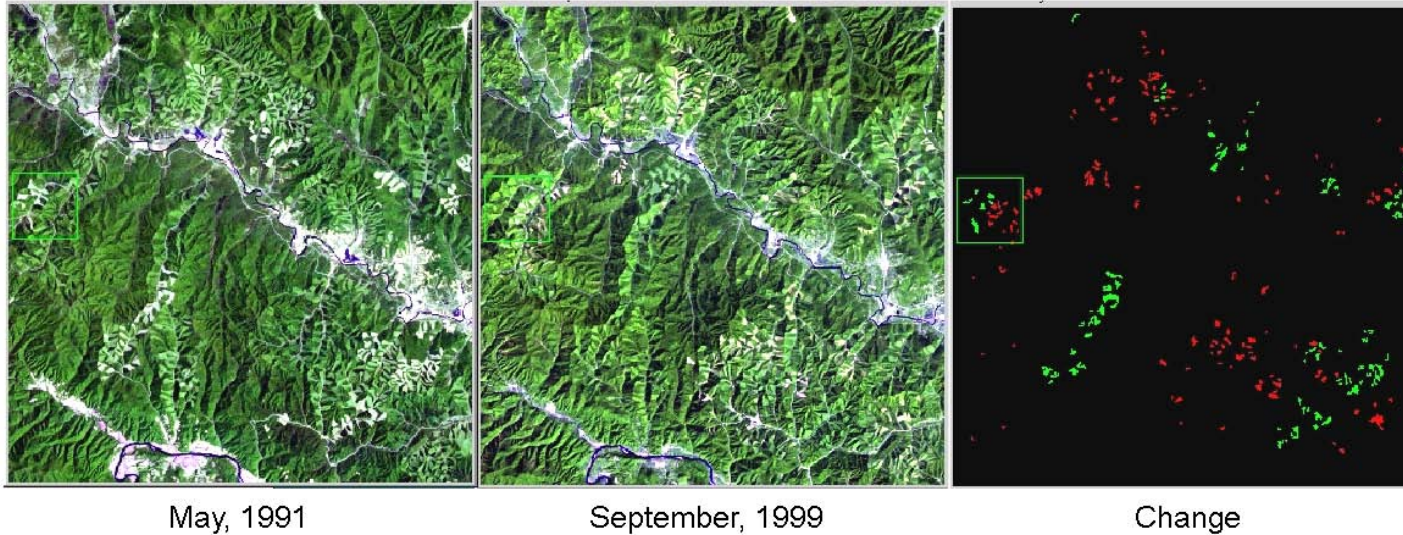


June, 1987

June, 2000

Change

(b) Chang Bai



May, 1991

September, 1999

Change

Representative examples of forest cover change in NE China, using the spectral-angle change approach discussed in the text with red representing forest loss and green representing forest gain. Landsat-5 and Landsat-7 images are shown using band 7-5-3 RGB combinations.

(a) Large-scale forest clearing in Da Xingan Ling range, centered on $50^{\circ}01'N$, $124^{\circ}19'E$;

(b) Plantation forestry in Chang Bai region, centered on $42^{\circ}56'N$, $127^{\circ}49'E$.