

User Requirements	Spatial Resolution	Temporal Resolution	Delivery Timeliness	Sensor/Wavelength
1990 Baseline Estimate				
-Forest Status	1-5 ha	1 x Year	Same	-IMSR: vis (Red)/IR (NIR)
-Forest Type	1-5 ha	1 x Year	Same	-IMSR: vis (Red)/IR (NIR)
1990 Baseline Variation (incl. ARD + Fire)	1-5 ha	1 x Year	Same	-IMSR: vis (Red, Blue)/IR (NIR-SWIR) -IMSR: vis/IR (TIR for fire detection) -SAR -Lidar
Land Cover Status/Trends	1-5 ha	1 x Year	Same	-IMSR: vis (Green, Red)/IR (NIR-SWIR) -IMSR: Passive Microwave -Lidar -SAR
Land Use	1-5 ha	1 x Year	Same	-Pan/Optical -IMSR: vis (Blue for soils)/IR (SWIR-TIR) -SAR

How does the Existing Open Skies Sensor Suite Compare to these URs?

Which UR Data Needs Could the Regime Support?

Of the four main categories of the users' need for data, at present time the Open Skies regime could provide suitable imagery to support only one of them – the variation to the 1990 carbon stock baseline – and even then only partially. Two monitoring parameters are of relevance here, namely the forest cover conversion (ARD) activities and the burned (or logged) areas of the forest. In either case, the Open Skies visual and SAR data could usefully complement radiometric measurements taken by orbiting satellites. Once it becomes available operationally in 2006, the Open Skies thermal infra-red data could be used for low-temperature hotspot detection, tracking of active fires at night and long-term monitoring of coal seam fires, both on the surface and below the ground.

What is the Information Gap?

Insofar as environmental monitoring goes in general, the most serious deficiency of the Open Skies regime at the present moment lies in its inability to collect multi-spectral radiometric imagery in visual and infra-red bands. In the narrower context of the Kyoto Protocol this deficiency effectively forecloses for the regime any possibility for contributing data in three areas of some import:

1. detection and tracking of fire-emission products (smoke, aerosols and particulate matter) in the atmosphere²⁴;
2. classification of vegetation by species, density, health and vigor, and;
3. detection, measurement and mapping of biomass change.²⁵

²⁴ Although fighting forest fires may seem to be a local concern, the effects of forest fires are not only local. By emitting both GHGs and particulate matter into the atmosphere fires play an important part in climate change and they contribute to problems such as deforestation, desertification and air pollution. One of the main problems is that information on the effects of forest fires does not exist at regional and international scales. In addition, current global (and regional) estimates of fire emissions are extremely approximate and vary considerably. With the Kyoto Protocol in place the accuracy of biomass burning emission estimates must be improved for national commitments to be met and for national reporting to be verified as being accurate. See European Space Agency, *Forest Fires. NADIS, Draft Requirements Briefing* (February 21, 2001), p. 1.

²⁵ National biomass inventories and information on land cover changes (in terms of rate of changes, land use changes, processes driving changes and directions of change) are an essential element for producing national carbon release estimates. Yet even with Kyoto Protocol in place, this baseline information is often lacking, especially in the developing world. This results in a lack of consistency, if nothing else, in national reporting.