

**Commission for Basic Systems  
Extraordinary Session  
(Cairns, 4-12 December 2002)**

(Excerpt)

**Observational data Requirements and Redesign of the Global Observing Systems**

6.1.19 The vision for the evolution of the GOS to 2015 and beyond included:

**(a) For the space-based component:**

- (i) Six operational GEOs:
  - a. All with multispectral imager (IR/VIS);
  - b. Some with hyperspectral sounder (IR);
  
- (ii) Four operational LEOs:
  - a. Optimally spaced in time;
  - b. All with multispectral imager (MW/IR/VIS/UV);
  - c. All with sounder (MW);
  - d. Three with hyperspectral sounder (IR);
  - e. All with RO;
  - f. Two with altimeter;
  - g. Three with conical scanning MW or scatterometer;
  
- (iii) Several R&D satellites serving WMO Members and comprised of:
  - a. A constellation of small satellites for RO;
  - b. LEO with wind lidar;
  - c. LEO with active and passive microwave precipitation instruments;
  - d. LEO and GEO with advanced Hyperspectral capabilities;
  - e. GEO lightning;
  - f. Possibly GEO microwave;
  
- (iv) Improved inter-calibration and operational continuity;

**(b) For the surface-based component:**

- (i) Automation to enable:
  - a. Targeted observations in data-sensitive areas;
  - b. Optimal operation of:
    - i. Rawinsondes;
    - ii. ASAP systems;
    - iii. Aircraft in flight;
  
- (ii) Rawinsondes:
  - a. Optimized utilization;
  - b. Stable GUAN;
  - c. Supplemented by:
    - i. AMDAR ascent/descent;
    - ii. Ground-based GPS water vapour measurements;
    - iii. Wind profilers;
    - iv. Satellite soundings (MW, GPS-OS, advanced IR);
  - d. Rawinsondes automatically launched;
  - e. Computerized data processing;
  - f. Real-time data transmission;
  - g. High vertical resolution;

- (iii) Commercial aircraft observations:
  - a. Of temperature and wind plus humidity on some aircraft;
  - b. In-flight and ascent/descent data;
  - c. High temporal resolution;
  - d. Availability from most airports including currently data void airports in Asia, Africa and South America;
  - e. Possibly supplemented with unmanned aerial vehicles;
  
- (iv) Surface observations:
  - a. Automated systems;
  - b. Land sensors at high spatial resolution, supporting local applications such as road weather;
  - c. Ocean platforms (ship, buoys, profiling floats, moorings) in adequate number to complement satellite measurements;
  
- (v) Radar observing systems, measuring:
  - a. Radial winds;
  - b. Hydrometeor distribution and size;
  - c. Precipitation phase and rate;
  - d. Multiple cloud layers, including cloud base and cloud top height;
  
- (vi) Data collection and transmission:
  - a. Digital in a highly compressed form;
  - b. Entirely computerized data processing;
  - c. Role of humans in observing chain reduced to minimum;
  - d. Information technology in all areas of life to provide new opportunities for obtaining and communicating observations;
  - e. For satellite data in particular:
    - i. Use of ADM including regional/special DCPC in the context of FWIS;
    - ii. DB for special local applications in need on minimal time delay and as backup.