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7.7 *Environmental monitoring facilities*

Definition:

(INSPIRE, 2007) Location and operation of environmental monitoring facilities includes observation and measurement of emissions, of the state of environmental media and of other ecosystem parameters (biodiversity, ecological conditions of vegetation, etc.) by or on behalf of public authorities.

Description:

Environmental monitoring facilities are facilities for observations and measurements of emissions, status and effects of environmental media (e.g. air, forest, marine water) and/or other environmental aspects (e.g. biodiversity, human health. The concept of monitoring may relate to systematic and hierarchical structures, including monitoring networks, monitoring stations, monitoring site and subsites. The monitoring sites may be permanently located at a site or can be temporal, only used for a certain time. Continuous moving monitoring facilities, e.g. on ships, may be a kind of monitoring facility. Monitoring sites in the form of locations and areas can be reported as georeferenced points, lines and polygons. In cases where data are classified or confidential, aggregation to grids may be a possibility. It is problematic that the definition of the theme refers to the kinds of delivery organisations to supply data, as the INSPIRE Directive in specific paragraphs defines for which organisations the directive is valid.

Scope, use examples:

Many different conventions, directives, scientific monitoring programmes and other agreements direct monitoring and the flow of monitoring information linked to the monitoring sites. At present different institutions use different data models and definitions. INSPIRE includes a more general model of monitoring sites.

Examples:

- **Meteorological stations::** Includes both recording of weather conditions and climatological information. The information may include simple information on precipitation, temperature, but also stations with additional info on snow cover, humidity etc. Important in many kinds of environmental assessment. Different organisations, e.g. ECOMET, may provide data, commonly real-time, from National Meteorological and Hydrological Services. The category "meteorological station" may also be defined as point location for climatological information, such as general attributes and additional information on max/min monthly temp/precipitation, wind speed, solar radiation, atmospheric pressure relative humidity, potential evapotranspiration, cloud cover. An example is the network of European climatological stations, long-term mean monthly and mean annual values of ca. 19 meteorological attributes exist for up to 4773 stations, while more common variables (rainfall, temp) exist for ca. 10.000 stations.
- **Air quality monitoring stations** Site location of monitoring site and stations for registration of air quality, hazardous substances (ozone), other pollutants. INSPIRE/ CAFÉ
- **Water monitoring stations** The Water Framework Directive is presenting different kinds of monitoring sites.
 - surface water monitoring stations
 - drinking water abstraction (investigative station, operational station)
 - groundwater monitoring stations (Groundwater Level Station, OperationalGWstation, SurveillanceGWstation)

Stations may be e.g. hydrometric (water quantity, flow and level only stations), chemical water quality, biological water quality.

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- **Phenological observation points:** sites where observations of phenological networks are performed (European phenological network EPN)
- **Marine environment monitoring stations:** Sea based monitoring facilities for measurement of ocean and sea bottom parameters and pollution (e.g. heavy metals, oils spills). May be linked to national and international conventions and agreements, e.g. OSPAR convention. [HELCOM reporting obligation](#), may serve as an example: It regulates: monitoring sites in the Baltic Sea, and requires registration and reporting on eutrophication, pollution by metals, pollution by toxic substances, water quality and water pollution. Different frequencies. Coverage: Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Russian Federation, Sweden. See HELCOM reporting obligation from Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992 (Helsinki Convention, revised in 1992).
- **Soil monitoring sites:** monitoring of trends in chemical conditions of soils
- **Magnetic field intensity observation stations**
- **Bathing site:** Compliance to the Bathing Water Quality Directive 76/160/EEC: Coastal and Fresh Water Zones: Data reported are on the quality of bathing waters (coastal and freshwater zones) as per Directive 76/160/EEC on Bathing Water Quality. Parameters for which compliance is calculated include: total coliforms, faecal coliforms, mineral oils, surface-active substances and phenols. The information is submitted to the Commission by the Member Countries and is made available as country reports on the web site of DG Environment. Source: DG Environment.
- **Other water related monitoring** defined in: Fish Water Directive (78/659/EEC) and Directive 76/464/EEC - Water pollution by discharges of certain dangerous substances.
- **GMO monitoring sites and areas:** Directive 2001/18/EC, Annex VII (http://ec.europa.eu/environment/biotechnology/pdf/dec2002_811.pdf) stipulates that monitoring and reporting on the deliberate release of GMOs are carried out in the environment. Examples of elements to be monitored are a) effects on non-target organisms (including development of resistance in wild relatives) or pest organisms, change in the host range or in the dispersal of pest organisms and viruses, development of new viruses; b) dispersal, establishment and persistence into non-target environments or ecosystems; c) out-crossing with sexually compatible wild relatives in natural populations; d) unintended changes in the basic behaviour of the organism, for example, changes in reproduction; e) changes in biodiversity (e.g. in number or composition of species). The monitoring design (sites and areas) must be indicated. It includes agricultural fields where the crop is commercially grown as well as surrounding habitats.

Important feature types and attributes:

The theme is wide and different communities may have different models for defining monitoring facility. An example of possible general content is given underneath. The theme may be possible to subdivide into sub-themes, allowing different fields to define their core sets of characteristics. Extensions to defined data models, feature types or attributes may be done at defined intervals of time.

Registration/monitoring site

- registration authority
- registration regime
- measurement methodology
- registration parameter
- parameter units
- parameter value
- registration date, time

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Links and overlaps with other themes:

Environmental facilities may be buildings or located to existing facilities, industry etc. The theme may thus overlap with INSPIRE themes such as

- Hydrography
- Protected sites
- Orthoimagery
- Geology
- Buildings
- Soil
- Human health and safety
- Production and industrial facilities,
- Agriculture and aquaculture facilities
- Utility and government services
- Natural Risk Zones
- Atmospheric conditions
- Meteorological geographical features
- Oceanographic geographical features
- Sea Regions

Reference documents:

Convention on the Protection of the Marine Environment of the Baltic Sea Area, 1992 (Helsinki Convention, revised in 1992)

CSI – Piemonte: SIRI - Conceptual Schema

Directive 76/160/EEC - Bathing Water Quality Directive: Coastal and Fresh Water Zones

Directive 76/464/EEC - Water pollution by discharges of certain dangerous substances.

Directive 78/659/EEC - Fish Water Directive

Directive 2001/18/EC, Annex VII (http://ec.europa.eu/environment/biotechnology/pdf/dec2002_811.pdf) on the deliberate release of GMOs into the environment

Directive 2006/118/EC - Groundwater Protection Directive

Norwegian feature catalogue and standards

"Soils protection" Directive proposal (COM(2006)0232)

Water Framework Directive: (2000/60/EC), annex V – 1.3, VII – 4: surface water monitoring network in the river basin management plan.