Core units: Key understandings – Years 7–8
Illustration 2: Scale in physical geography

Operational scale

Operational scale refers to the appropriate scale at which landforms are to be examined. It also includes the problem of scale resolution.

Geographers using remotely sensed images and Geographic Information Systems (GIS) are concerned with issues of the resolution of the data to be examined. Data obtained from the first Landsat satellite MSS had an 80 m resolution – the individual pixels or picture elements were approximately 80 m x 80 m in size. A landform feature that is smaller than this would not be detected. The later Landsat Thematic Mapper imagery was 30 m resolution, and the French SPOT satellite had a 10 m resolution. Each different resolution is likely to lead to a different set of results in an analysis of landforms. This has been a persistent problem in geographical inquiry where conclusions derived from studies at one scale should not be expected to apply when examined at other scales.

A good example of this is an examination of the spread of plants and animals after the famous 1883 eruption in Krakatoa, Indonesia, that obliterated the island. A recent visitor described thick moist forests teeming with birds and butterflies. There were footprints of geckos and rats, and a 2 m long lizard emerged from the forest with an enormous tail flicking from side to side, its fat brown body slithering along the ground. When the re-colonisation process is examined at one scale, there are different plant and animal communities along the shoreline, in the foot slopes, wetlands and other habitats. At a larger scale, the biodiversity is controlled by the dictates of Island Biogeography Theory – how far the island is away from the mainland and the extent of the biodiversity of the adjacent mainland. As we change scale, both the questions and answers are different.

Another example comes from fieldwork carried out by students from the University of Cambridge. Studying sandy soils in East Anglia, the geographers found that when they took soil samples at 2 km intervals the samples coarsened towards the north-east, indicating the presumed source of the windblown materials was in the north-eastern sector. When they examined samples at the smallest scale, 8 m, they could detect the effects of soils churning and sorting during periglacial conditions. When they located samples at scales of 125–1000 m they postulated that the deposits showed ancient dune formation in a much drier climatic episode.