Name of Method: Spatial analysis techniques/GIS

Summary of Method: The method uses spatial data, i.e. data for which x y co-ordinates are available, to plot the information, generally in map form, with the potential for interrogation of the data. It can be used to overlay maps containing different datasets, which is useful when identifying potential cumulative impacts or impact interactions. The overlay approach can also be used to superimpose potential changes associated with a plan or project onto mapped receptors or resources, to establish where impact significance is potentially greatest. The mapping processes also enables the data to be analysed, for example to map areas of habitat or to interpolate between data points.

The method is generally only used for data analysis on the spatial scale and not temporal, although the potential for this is increasing. Such an application is particularly important, as the definition of temporal and spatial boundaries is one of the most difficult parts of cumulative assessment, due to its inherent variability.

Advantages of Method: The results are visually accessible (including to the lay person), with the visual images generated often being useful for data presentation and interpretation. Depending on the software being used and the type of data available, the information can also be interrogated to provide additional insight to the data.

Limitations of Method: To use the method, specialist software is required together with skilled staff and appropriate data. Datasets without co-ordinates have limited use in this method, although such data can be placed within the package by estimating location. The benefit that can be gained is generally a function of the capabilities of the software, with different packages capable of manipulating the data in different ways, the more expensive packages generally enabling more complex procedures, and the experience of the operator. It is generally difficult to include time or z co-ordinates – i.e. the method is generally restricted to 2-D. The method can be expensive and time consuming, difficult to quantify impacts and there can be problems with updating information.

References:

European Commission Directorate General – Environment, Nuclear Safety and Civil Protection, 1999. Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.

Oakwood Environmental Ltd, 1999. Strategic Cumulative Effects of Marine Aggregate Dredging.

Posford Duvivier Environment and Hill, MI, 2001. Guidelines on the Effects of Aggregate Extraction on European Marine Sites. LIFE – Nature UK Marine SACs Project.

South West Ecological Surveys, Levett-Therivel sustainability consultants and Oxford Brookes University, 2004. Strategic Environmental Assessment and Biodiversity: Guidance for Practitioners. Report to CCW, EN, EA and RSPB.