***Thematic Map Tasks***

***Create thematic maps to help convey the potential impacts of climate change on landscape character types using a bespoke LANDMAP classification and targeted datasets.***

***The LANDMAP Visual & Sensory hierarchical classification has been adapted to bring together landform and land cover classes at level 2 and 3 into new summarised categories for reporting*** ***the potential impacts of climate change on landscape types and potential changes in character and qualities that may be associated with these landscapes. The bespoke classification is explained in Part A Appendix 1.***

1. ***Using the LANDMAP Visual & Sensory spatial dataset prepare the GIS dataset as required and then produce the following thematic maps as high-quality PDF images. Some settlement names or geographic locations (e.g. mountain tops) should be included to assist with orientation.***

***The edited GIS dataset defining the categories should be delivered to be compatible with ArcGIS 10***

|  |  |  |
| --- | --- | --- |
| *Thematic Map* | *Thematic Map to be produced* | *Edits required* |
| ***Create LMP14*** | ***LANDMAP 14 landscape categories***  *Most detailed level of reporting the potential impacts of climate change on landscape.* | *Appendix 1, Table 1 for source of Visual & Sensory classifications summarised as per Appendix 1 Table 2 applied to LANDMAP Visual & Sensory dataset* |
| ***LMP14AS*** | ***LANDMAP 14 landscape categories***  *Most detailed level of reporting the potential impacts of climate change on landscape with overlay of 6 terrestrial Area Statement boundaries* | *As above* |
| ***Create LMP09*** | ***LANDMAP 9 high level landscape categories***  *Refinement of the 14 landscape categories into broader landscape types* | *Appendix 1, Table 3 for source of Visual & Sensory classifications summarised as per Appendix 1 Table 4 applied to LANDMAP Visual & Sensory dataset* |
| ***Using LMP14 Create LMP14<1m*** | ***LANDMAP landscape categories highlighting landscapes less than 1m in contour height,*** *indicating vulnerability to rising sea levels in coastal areas.*  *To use thematic map LMP14 and height data to identify coastal and estuarine landscapes at risk e.g. ‘Valleys, rolling and flat lowland’ could have a subcategory for those areas affected ‘Valleys, rolling and flat lowland below 1m’’* | *Generate a contour from 0-1 metres (e.g. using LiDAR) applied to the 14 landscape categories* |
| ***Using LMP14 Create LMP14 flood risk*** | ***LANDMAP landscape categories highlighting landscapes currently at risk of flooding (coastal and fluvial)***  *To use thematic map LMP14 and flood risk data to identify landscapes at risk e.g. Built land - communities could have a subcategory for those areas affected ‘Built land – communities with flood risk’* | *Flood Map Data Zones 2 and 3 applied to the 14 landscape categories* |
| ***LMP14 boundaries*** | ***LANDMAP landscape categories and boundary type.***  *To use thematic map LMP14 and question 7 boundary type to produce a thematic map colour coded to question 7 responses but with a thick black outline to denote the 14 outer boundaries to each area* | *Using LANDMAP Visual & Sensory question 7 boundary type* |
| ***LMP14 evaluation*** | ***LANDMAP landscape categories and overall evaluation***  *To use thematic map LMP14 and question 26 Value to produce a thematic map colour coded to question 26 responses but with a thick black outline to denote the 14 outer boundaries to each area* | *Using LANDMAP Visual & Sensory question 26 Value* |

***Datasets***

|  |
| --- |
| *LANDMAP Visual & Sensory dataset is available to download from*  [*http://lle.gov.wales/catalogue/item/LandmapVisualSensory/?lang=en*](http://lle.gov.wales/catalogue/item/LandmapVisualSensory/?lang=en) |
| *Flood Map: Flood Zone 2 is available to download from*  [*http://lle.gov.wales/catalogue/item/FloodZ2/?lang=en*](http://lle.gov.wales/catalogue/item/FloodZ2/?lang=en) |
| *Flood Map: Flood Zone 3 is available to download from*  [*http://lle.gov.wales/catalogue/item/Flood3/?lang=en*](http://lle.gov.wales/catalogue/item/Flood3/?lang=en) |
| *LiDAR*  [*http://lle.gov.wales/catalogue/item/LidarCompositeDataset/?lang=en*](http://lle.gov.wales/catalogue/item/LidarCompositeDataset/?lang=en) |
| *Alternative or additional datasets could be proposed.* |
| ***Please advise at the earliest opportunity any datasets you may require from NRW****, or if you already have the datasets, what you will need the licence for. For example OS basemapping.*  *All data provided by NRW is covered by the Public-Sector Mapping Agreement, any other data sources not covered by the PSMA should have correct licencing agreements. Data delivered will be provided in ArcGIS 10.2 file geodatabase with outputs compatible with ArcGis10.2 e.g. feature class.* |

1. ***Present the thematic maps identified in task 1. as additional high-quality PDF images zoomed in to an appropriate resolution scale for the geographical areas:***

* *Denbighshire*
* *‘Gwent’ (Blaenau Gwent County Borough, Caerphilly County Borough, Monmouthshire, City of Newport and Torfaen County Borough)*
* *Ceredigion*

***Statistics Tasks***

1. ***Prepare the following statistics to go with the maps created in task 1.***

|  |  |
| --- | --- |
| *Map* | *Statistics to be produced* |
| ***LMP14*** | ***LANDMAP 14 landscape categories***  *% and km2 for each category* |
| ***LMP14AS*** | ***LANDMAP 14 landscape categories***  *% and km2 for each category within each of the 6 Area Statement areas* |
| ***LMP09*** | ***LANDMAP 9 high level landscape categories***  *% and km2 for each category* |
| ***LMP14<1m*** | ***LANDMAP landscape categories highlighting landscapes less than 1m in contour height***  *% and km2 for each category and subcategory (no double counting)* |
| ***LMP14 flood risk*** | ***LANDMAP landscape categories highlighting landscapes currently at risk of flooding (coastal and fluvial)***  *% and km2 for each category and subcategory (no double counting)* |
| ***LMP14 boundaries*** | ***LANDMAP landscape categories and boundary type.***  *% and km2 for each category* |
| ***LMP14 evaluation*** | ***LANDMAP landscape categories and overall evaluation***  *% and km2 for each category* |

**Part A Appendix 1**

The adapted LANDMAP Visual & Sensory hierarchical classification\* that brings together landform and land cover classes at level 2 and 3 into new summarised categories for reporting the potential impacts of climate change on landscape types and potential adaptations that may be associated with these landscapes.

(\*<https://cdn.naturalresources.wales/media/677816/visual-sensory-landmap-methodology-2016-v2.pdf?mode=pad&rnd=131472708500000000> page 3)

**Explanatory notes behind the classification choices**

* The hybrid classification uses all three LANDMAP Visual & Sensory classes, however the key determinants behind the classification places particular emphasis on groupings that may reflect landscape habitats and elements such as woodland, hedgerows, moorland and grazing, which may be impacted by potential climate changes such as pests and diseases, wild fires, desiccation/drying out of grasslands and coastal flooding changes more than underlying landform. These factors therefore have increased emphasis in the categories identified.
* Current percentages relating to predominant landcover at level 3 have been highly influential in the categorisation.
* The existing Visual & Sensory 45 classifications at level 3 are refined to 14 new categories that are still underpinned by LANDMAP quality assured and consistent evidence. Table 1 illustrates how the categories have been arrived at by grouping classifications. Table 1 includes simplified definitions of the LANDMAP Visual & Sensory classification categories to aid understanding of the basis for the groupings. The full description is available from the methodology link\* above, on page 5.
* Table 2 summarises the 14 key landscape categories of table 1 and will be the basis for the mapping at the most detailed level
* Colour coding of categories helps with tracing how the categories have been grouped and will relate to the thematic maps to be produced.

**Table 1 Origin of categories for reporting the potential impacts of climate change on landscape**

|  |  |  |
| --- | --- | --- |
| Grouped level 2 classifications | Containing these Level 3 classifications | Summary definitions |
| **Upland 150-300+m** | | |
| Upland, exposed plateau, valleys, hillsides and scarp slopes  Wooded 20-50% | **Wooded >20% upland & plateaux** | woodland >20% |
| **Mosaic upland & plateaux (<10 ha, 20-50%)** | <10ha woodland 20-50% |
| **Open/wooded(<10 ha, 20-50%) mosaic upland valleys** | <10ha woodland 20-50% |
| **Wooded >20% upland valleys** | wooded >20% |
| **Hillside & scarp slopes mosaic** | patchwork woodland 20-50% |
| **Hill and lower plateau mosaic** | woodland 20-50% |
| Upland plateau, hillsides and scarp slopes  Moorland 20-50%+ | **Upland moorland** | moorland >50% |
| **Hillside & scarp slopes moorland** | wooded <20%, <50% open moorland |
| **Hill and lower plateau moorland** | wooded <20% <50% open moorland |
| Upland  Rock & Scree | **Barren/rocky upland** | >25%rock & scree |
| Upland valleys, hillsides, lower plateau and scarps  Grassland >50%, open, predominantly unwooded | **Upland grazing** | grazed grassland >50% |
| **Hill and lower plateau grazing** | wooded <20% grazed grassland >50% |
| **Open upland valleys (<20% wooded)** | unwooded <20% |
| **Hillside & scarp slopes grazing** | wooded <20%, grazed grassland >50% |
| **Open hillside and scarp slopes** | predominantly unwooded |
| **Open hill and lower plateau** | predominantly unwooded. |
| Upland  Hills, lower plateau & scarp slopes  Wooded >50% | **Wooded hillside & scarp slopes** | wooded >50% |
| **Wooded hill and lower plateau** | wooded >50% |
| **Lowland** | | |
| Valleys and rolling lowland  Mosaic 20-50% wooded, hedgerow character | **Mosaic lowland valleys** | woodland 20-50% hedgerow trees. villages, mosaic. |
| **Mosaic rolling lowland** | small woodland 20-50% density hedgerow trees. other land uses mosaic. |
| Valleys, rolling and flat lowland  Grassland >50%, open, <20% wooded, lacking hedgerow trees | **Open lowland valleys** | wooded <20% lack hedgerow trees. |
| **Open rolling lowland** | wooded <20% with few trees. |
| **Flat open lowland farmland** | wooded <20% farmland |
| Valleys, rolling and flat lowland  Wooded >50% | **Wooded lowland valleys** | wooded >50% |
| **Wooded rolling lowland** | Predominantly wooded >50% |
| **Flat wooded lowland** | wooded >50% |
| **Lowland wetland** | wetland >50% |

|  |  |  |  |
| --- | --- | --- | --- |
| Coastal edge, cliffs and islands | | **Intertidal** | between low and high water, beaches, mud and rocks |
| **Dunes and dune slack** | Face open sea dunes or dune slacks. |
| **Cliffs & cliff tops** | rocky or sandy cliffs cliff-top rough grazing, scrub, or woodland |
| **Other coastal wild land** | As cliffs but <10m |
| **Small island** | separated from the coast at low tide less than 20ha |
| **Development** | | |
| Built land - communities | **Village** | rural communities |
| **Dispersed settlement** | rural communities >15 houses |
| **Urban** | larger, urban communities |
| Amenity and informal space | **Amenity land** | open space (>10Ha), formal parks, golf courses, playing fields |
| **Informal open space** | informal open space (>100Ha) in built context, urban river corridors and woodland |
| Industry and infrastructure | **Excavation** | (>100Ha) working quarries, mines, landfill |
| **Derelict / waste ground** | (>100Ha) disused industrial sites, mines and quarries, tips. |
| **Road corridor** | Major road corridor, dual carriageway |
| **Water** | | |
| Coastal waters | **Sea** | Open Water beyond the OS map low water line. |
| **Estuary** | Open water areas, beyond the OS map low water line that is predominantly river mouths |
| Inland water | **River** | Inland Water areas that is a large river approximately >20m |
| **Lake** | Inland Water areas that is predominantly a large lake or reservoir (>50ha) |
| **Ria** | Inland Water extension to an estuary with tidal characteristics including mud flats and edges. (>50ha) |

**Table 2 Summary of 14 categories for reporting the potential impacts of climate change on landscape**

These categories will be further refined by selected datasets.

|  |  |  |
| --- | --- | --- |
| Upland  Hills, lower plateau & scarp slopes  Wooded >50% | Valleys, rolling and flat lowland  Wooded >50% | Classification key |
| Upland, exposed plateau, valleys, hillsides and scarp slopes  Wooded 20-50% | Valleys and rolling lowland  Mosaic 20-50% wooded, hedgerow character | Inland water |
| Upland plateau, hillsides and scarp slopes  Moorland 20-50%+ | Valleys, rolling and flat lowland. Grassland >50%, open, <20% wooded, lacking hedgerow trees | Built land - communities |
| Upland valleys, hillsides, lower plateau and scarps  Grassland >50%, open, predominantly unwooded | Coastal edge, cliffs and islands | Industry and infrastructure |
| Upland Rock scree | Coastal waters | Amenity and informal space |

Table 3 is a further simplification to refine the 14 landscape categories into broad landscapes. Table 3 defines the origin of the 9 high level categories from the 14 categories

**Table 3 Origin of 9 high level categories from 14 categories**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Upland  >20% Wooded | Upland  Hills, lower plateau & scarp slopes  Wooded >50% | Lowland mosaic, >20% wooded | Valleys, rolling and flat lowland  Wooded >50% |  | Classification key |
| Upland, exposed plateau, valleys, hillsides and scarp slopes  Wooded 20-50% | Valleys and rolling lowland  Mosaic 20-50% wooded, hedgerow character | Inland water | Inland water |
| Upland  20-50% Moorland and scree | Upland plateau, hillsides and scarp slopes  Moorland 20-50%+ | Lowland open >50% grassland, <20% wooded | Valleys, rolling and flat lowland. Grassland >50%, open, <20% wooded, lacking hedgerow trees | Built land | Built land - communities |
| Upland Rock scree | Coast | Coastal edge, cliffs and islands | Industry and infrastructure |
| Upland open >50% grassland | Upland valleys, hillsides, lower plateau and scarps  Grassland >50%, open, predominantly unwooded | Coastal waters | Amenity and informal space | Amenity and informal space |

Table 4 is a summary of the 9 high level categories from table 3. These categories will be further refined by selected datasets.

**Table 4 Summary of 9 high level categories for reporting the potential impacts of climate change on landscape**

|  |  |  |
| --- | --- | --- |
| Upland  >20% Wooded | Lowland mosaic, >20% wooded | Inland water |
| Upland  20-50% Moorland and scree | Lowland open >50% grassland, <20% wooded | Built land |
| Upland open >50% grassland | Coast | Amenity and informal space |