Ecosystem services mapping in the uMngeni catchment
Background

• Fill ecosystem services gaps resulting from 2015 Green-Fund project between UKZN and SANBI

• Outputs of Green Fund project could be enhanced by the mapping and inclusion of other ecosystem services

• Understand NRM presence in uMngeni catchment based on ecosystem service priority map
Approach to ecosystem services mapping

• Critical issue in respect of ecosystem services is **supply of and demand for services**

• Supply of ecosystem services may be influenced by the type, extent and condition of the ecosystem

• Demand for ecosystem services relied on socio-economic information gleaned from various sources

• Mapped services:
  - Biodiversity (habitat)
  - Ecotourism and outdoor recreation
  - Flood attenuation
  - Carbon sequestration and storage (National Terrestrial Carbon Sinks Assessment (NTCSA))
Methodology

• Important supply areas for selected ecosystem services derived based on land cover maps, available data sets and expert judgment

• Likely level of service delivery scaled according to ecosystem type, condition and extent

• Ecosystem service delivery areas were identified for each service by integrating the supply and demand maps

• Data was aggregated and prioritised to a micro-catchment level
Biodiversity example

• Only factor affecting the supply of this service is the condition of the ecosystem

• Condition layer developed and used to represent the supply of intrinsic value of biodiversity (NDVI as a surrogate for condition)

• Critical Biodiversity Areas (CBAs) - Demand
Condition layer = Biodiversity supply

CBAs = Biodiversity Demand

Integrated biodiversity layer
Priority catchment ES maps

Biodiversity

Tourism

Flood attenuation

Carbon sequestration
Comparison of priority areas

- Density of high potential areas used as surrogate for areas which should be rehabilitated to enhance the respective ecosystem services
Combined priority catchments

Biodiversity, ecotourism, flood attenuation and carbon sequestration

Biodiversity, ecotourism, flood attenuation, carbon sequestration, streamflow, dry-season base flow and sediment retention.

Hierarchy of 145 sub-quaternary catchments (from Jewitt et al., 2015)

Priority quaternary catchments in the uMngeni catchment determined for DEA:NRM by Le Maitre and Forsyth (2012)
Comparison between priority catchments identified in all assessments

- Across prioritization processes the upper catchments of Lions River, Midmar and Impendle feature strongly

- Several micro-catchments also score highly in all four prioritization processes
Conclusion and recommendations

• Identified priority micro-catchments for range of ecosystem services and compared them with priority areas identified in other prioritization processes

• Some alignment between priority areas determined through different processes, elevating the importance of micro-catchments which feature in all processes

• Some NRM activities located in priority catchments, particularly Impendle, other NRM activities occur in low priority areas

• To better achieve the overall goal of the NRM programmes, activities should be concentrated in catchments which deliver multiple ecosystem services