

Surface water

Summary of natural capital assets and drivers of change

A three-tier (red/amber/green) assessment of: (1) the importance of natural capital assets to ecosystem service provision; and (2) the influence of drivers of change on these natural capital assets.

		Natural capital assets		
		Importance of natural capital asset to ecosystem service		
				Water
Drivers of change	Anthropogenic	Habitat modification		Influence of drivers on natural capital assets
		Industrial or domestic activities		
	Natural hazards / systems	Landslides		
		Droughts		
	Climate change impacts	Weather conditions		

Description of ecosystem service

Surface water is provided through freshwater resources from collected precipitation and water flow from natural sources.

Ecosystem service: classification according to CICES

Section	Division	Group	Class
Provisioning	Materials	Water	Surface water

Natural capital assets providing the service: identification and hierarchical classification of the key natural capital assets that provide or enable the ecosystem service (Leach *et al.* in review)

Level 1	Level 2	Level 3	Level 4
Abiotic	Functional	Water	Surface

Narrative description of the natural capital asset- ecosystem service system: generic description of the way in which natural capital assets provide the ecosystem service.

Surface water is delivered through water.

- **Water** – Water as an asset directly provides surface water. Surface water is therefore highly sensitive to changes in the amount of water in water bodies and rainfall.

Drivers of change in the asset-service system

Driver of change	Asset affected	Likely response of asset	Effect on variability of service provision	Human action or natural variation	Timescale	Spatial characteristics	Reference
Habitat modification	Water	Disturbance of natural water flows and sedimentation in catchments leading to geophysical alterations of water bodies. Water flow will increase or decrease depending on local conditions.	Increase or decrease in provision of surface water. If a certain volume of water is removed for industrial use and is not returned afterwards, then the total volume of surface water will be decreased by that volume. Increased sedimentation cuts light to animals, leads to nutrient blooms and loss of oxygen.	Human action	Short term – Disturbance of water bodies e.g. during construction work can materialise within months.	Local – Restricted to areas where water bodies are being disturbed as a result of human activity and/or where water is being heavily abstracted and downstream of these areas.	World Water Assessment Programme 2009; Yang & Dziegielewski, 2007.
	Water	Anthropogenic climate change is leading to severe decreases in water flows and alterations to the geological characteristics of water bodies (e.g. desiccation of entire rivers).	Decrease in surface water provision.	Human action	Long term – This impact will materialise over coming decades.	Global – Climate change is occurring on a global scale. Regional-Local – Impacts are likely to materialise on a landscape or regional scale, affecting watersheds where water bodies are altered; areas that are already under high water stress will likely be most severely impacted.	Vörösmarty et al. 2010.

Industrial or domestic activities	Water	Overuse by humans for agriculture, energy generation, other non-drinking purposes, and other industries leads to decreases in water flow and volume.	Decrease in surface water provision. Unless water is returned in equal volumes to water bodies after abstraction, then the volume of surface water provided through water bodies will be reduced by the amount that is not returned.	Human action	Short-term – Water abstraction for human purpose occurs on a daily basis and in many areas is resulting in overuse.	Local – Restricted to areas of unsustainable water use, such as big cities and large industrial and agricultural areas.	Mo et al. 2011.
Landslides	Water	Natural changes in local geomorphological characteristics of water bodies lead to increase or decrease in volumes of water flow and alter flow direction.	Increase or decrease in surface water provision.	Natural variation	Short-long term	Local	World Water Assessment Programme, 2009.
Droughts	Water	Anthropogenic climate change is leading to more frequent and severe droughts. Severe decreases in waterflows and alterations to the geological characteristics of water bodies, e.g. desiccation of entire rivers.	Decrease in surface water provision.	Human action	Long term	Global change with most severe impacts regionally and locally – watersheds where water bodies are altered and areas already under water stress will likely be most severely impacted.	Vörösmarty et al. 2010.
Weather conditions	Water	This affects watershed- or catchment- level water flows (i.e. increase or decrease in volume of water flowing through water bodies).	Increase or decrease in surface water provision.	Natural variation	Short term – Seasonal or annual variation	Global	De Wit & Stankiewicz, 2006.

Information and data

Data needs: Identification of data needed to assess the current of historical state of the asset-service system.

Description of data need	Classification	Aspect of the system
Change in availability of surface and ground water	Water	Natural capital asset
Change in population density and shipping activity	Industrial or domestic activities	Driver of change
Change in landslide severity	Landslides	Driver of change
Change in drought severity	Droughts	Driver of change
Change in the seasonality of temperature, precipitation and wind	Weather conditions	Driver of change

References

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