

Educational resources

Year 9-10: Geography

Sustainable ecosystem services and integrated water management



Lesson overview, to be utilised in conjunction with **Sustainable ecosystem services and integrated water management PowerPoint presentation**

Curriculum links

Geography / Levels 9 and 10 / Geographical Knowledge / Environmental change and management (VCGGK145)

Content description

- Environmental, economic and technological factors that influence environmental change and human responses to its management.

Elaborations

- Identifying human-induced environmental changes, such as water and atmospheric pollution, loss of biodiversity, degradation of land, inland and coastal aquatic environments, and evaluating the challenges they pose for the sustainability of environmental functions.
- Evaluating the concept of ecosystem services and the importance of these services for sustainability of biodiversity.
- Discussing whether environmental change is necessarily a problem that should be managed.
- Proposing geographical management strategies for the environmental change being investigated, for example, establishing reserves and corridors to preserve biodiversity (a spatial strategy), ecosystem-based management (an environmental strategy), urban planning to reduce energy consumption (a spatial strategy), and addressing the underlying as well as immediate causes of environmental change (holistic thinking).

- Applying the concept of place to explain the variety of strategies and solutions to similar environmental changes in different places.

Learning intentions

- To review the natural water cycle and the urban water cycle.
- To gain an understanding of ecosystem services and their importance in the context of water cycle management.
- To explore the integrated water management (IWM) approach and its significance for sustainable water resource utilisation.
- To design an IWM plan appropriate for a specific region.

Success criteria

- I can explain what ecosystem services are and why they are important to water cycle management.
- I can understand what Integrated Water Management (IWM) is and why it is necessary for water security and sustainability.
- I can design an IWM plan for a region, taking into account factors such as town size, natural water sources and average personal water usage.



Lesson overview

Using the supporting PowerPoint presentation: **Sustainable ecosystem services and integrated water management**, explore the content and discussion points as outlined below.

Slides 1 - 5:

Wannon Water information and introduction.

Optional - students can take notes to summarise key concepts/keywords throughout slideshow.

Slides 6 - 7:

Unpack the **Learning intentions** and **Success criteria**.

Slide 8:

Lesson introduction - How does water move through our environment? How do we use water?

In a small group, brainstorm/mind map/word splash (online) - the key ways water is used in modern communities - (health and hygiene, flora and fauna/ biodiversity, farming/agriculture/food production and security, leisure/social/wellbeing, industry etc).

Share and discuss.

Slides 9 - 11:

Natural Water Cycle and Urban Water Cycle - show and discuss, compare and contrast the diagrams and engage in a brief whole class discussion.

Slide 12:

Discussion prompts:

- What is urbanisation?
- What are the similarities and differences between the Natural Water Cycle and Urban Water Cycle?
- How has urbanisation impacted on the Water Cycle?

Slides 13 - 16:

Introduce the term - 'Ecosystems Services'.

Ecosystems services and their continued provision underpin human existence, health and prosperity.

Governments, communities and natural resource managers are taking a broader ecosystem approach to decision making for natural resource management issues that can achieve multiple benefits for landowners and society.

Biodiversity is central to the production of ecosystem services; it is the direct source of services, such as food and fibre, and underpins others, such as clean water and air, through the role of organisms in energy and material cycles.

Watch video embedded in the PowerPoint - **Ecosystem Services Video** <https://www.youtube.com/watch?v=vAjuYBzu4TI>

Key message - we need sustainable and healthy ecosystems for human survival and the health of our environment. The way we manage and engage with key resources impacts both us as humans, and the environment.

Credit: <https://www.dcceew.gov.au/environment/biodiversity/publications/ecosystem-services-key-concepts-and-applications>

Slides 17 - 19:

Introduce, Integrated Water Management and discuss - What is Integrated Water Management (IWM) and Why is it important?

Watch video embedded in the State Government of Victoria's website - [https://www.water.vic.gov.au/our-programs/integrated-water-management#:~:text=Integrated%20Water%20Management%20\(IWM\)%20is,environmental%20health%20and%20urban%20amenity](https://www.water.vic.gov.au/our-programs/integrated-water-management#:~:text=Integrated%20Water%20Management%20(IWM)%20is,environmental%20health%20and%20urban%20amenity)

Explore, case study examples of Wannon Water specific IWM

[Warrnambool College Roofwater Harvesting fact sheet](#)
[Hamilton Integrated Water Management Plan](#)



Slide 20:

Introduce and unpack key vocabulary.

Water Security: When a community has enough quality water for survival and productive activity.

Sustainability: The ability to meet our own needs, without compromising the ability of future generations to meet their needs.

Water Sensitive Urban Design: Stormwater is rainwater that has fallen onto roads or roofs and often contains chemicals or pollutants. Water sensitive urban design (WSUD) is an approach to planning and designing urban areas to make use of this valuable resource and reduce the harm it causes to our rivers and creeks.

Slides 21 - 23:

Small group activity - Integrated Water Management (IWM), Water Sensitive Urban Design and Sustainability.

In collaborative groups students are to imagine they are a team responsible for IWM in the region, ensuring Water Security and Sustainability for the future of the region. They are responsible for Water Sensitive Urban Design initiatives.

Three options with different considerations are provided in the PowerPoint, Slide 22, which students can select from.

Task specifics include:

- Design and outline one Water Sensitive Urban Design - IWM plan that will increase Water Security for the region into the future and provide sustainable benefits to the environment.
- Give a clear justification for WHY and HOW this approach will benefit both the human population and environment in the region. Students will need to be specific and justify reasons along the way.
- Outline briefly thoughts on how Water Security will impact on human wellbeing into the future.
- Present as a poster or a slide to share with the class.

Slide 24:

Share and reflect - prompt students to share and compare IWM plans. Discuss and justify - compare similarities and differences.

Slide 25:

For consideration, extension opportunities are provided.

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