

Waters of **LIFE**

Waters of LIFE Advisor training

Module 3 – Introduction to Catchment Science



An Roinn Tithíochta,
Rialtais Áitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

How do pollutants actually reach a waterbody?

Introducing the Source-pathway-receptor (SPR) model:



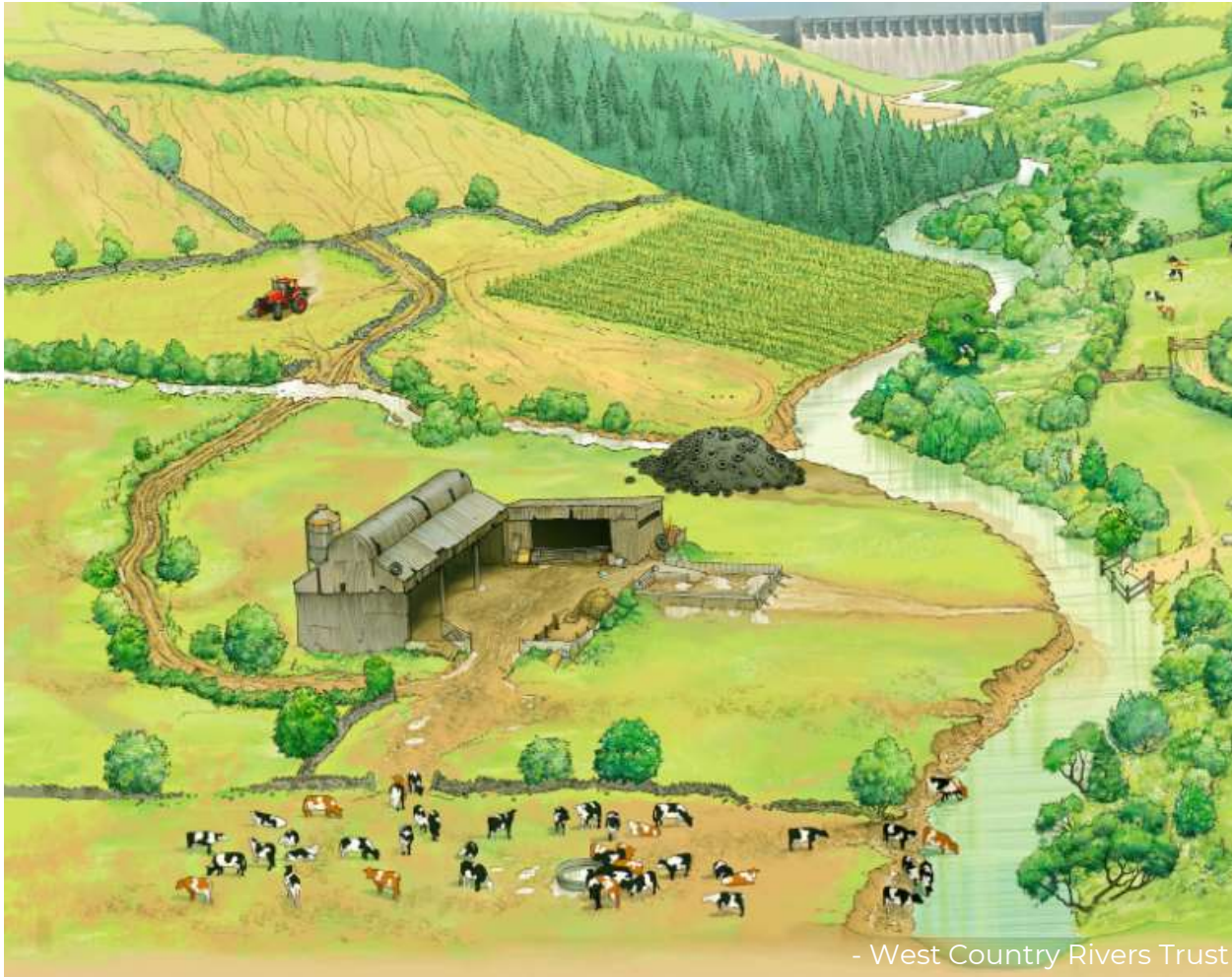
Each part required for there to be an impact

Catchments



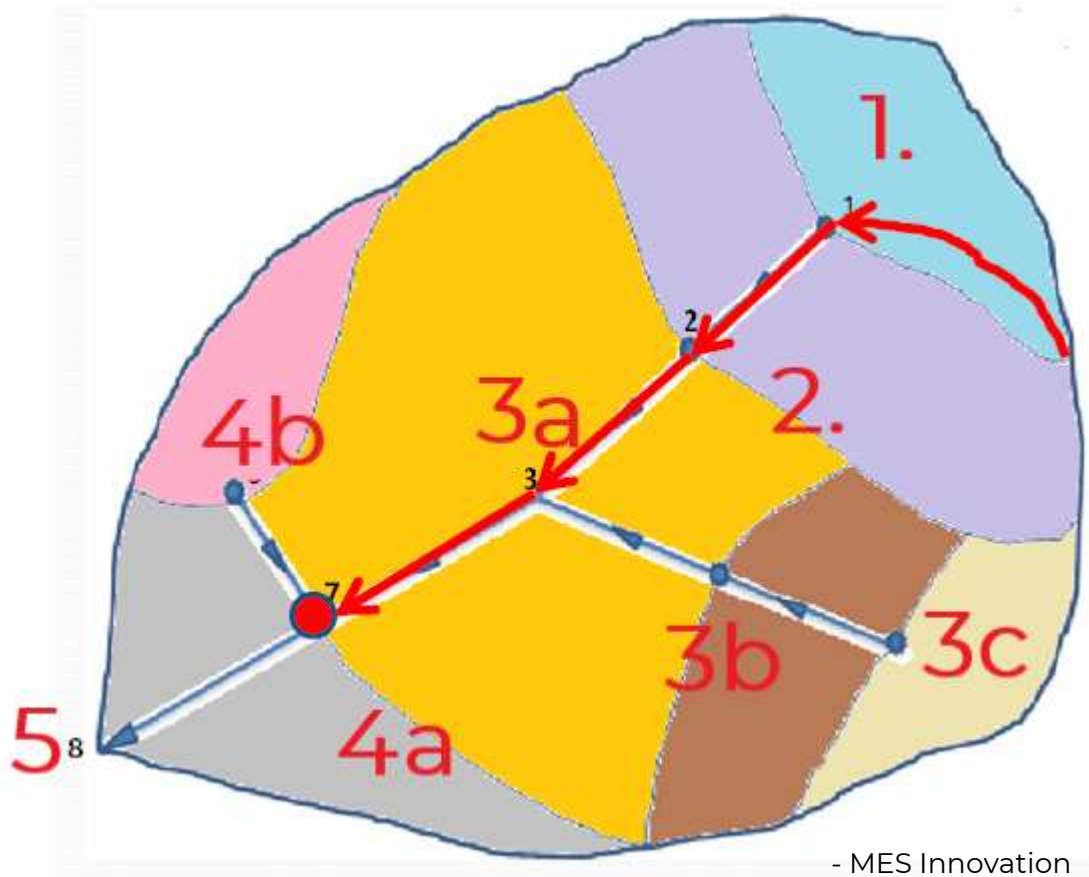
An area of land where all rainfall collects and drains to a single point.

Catchments



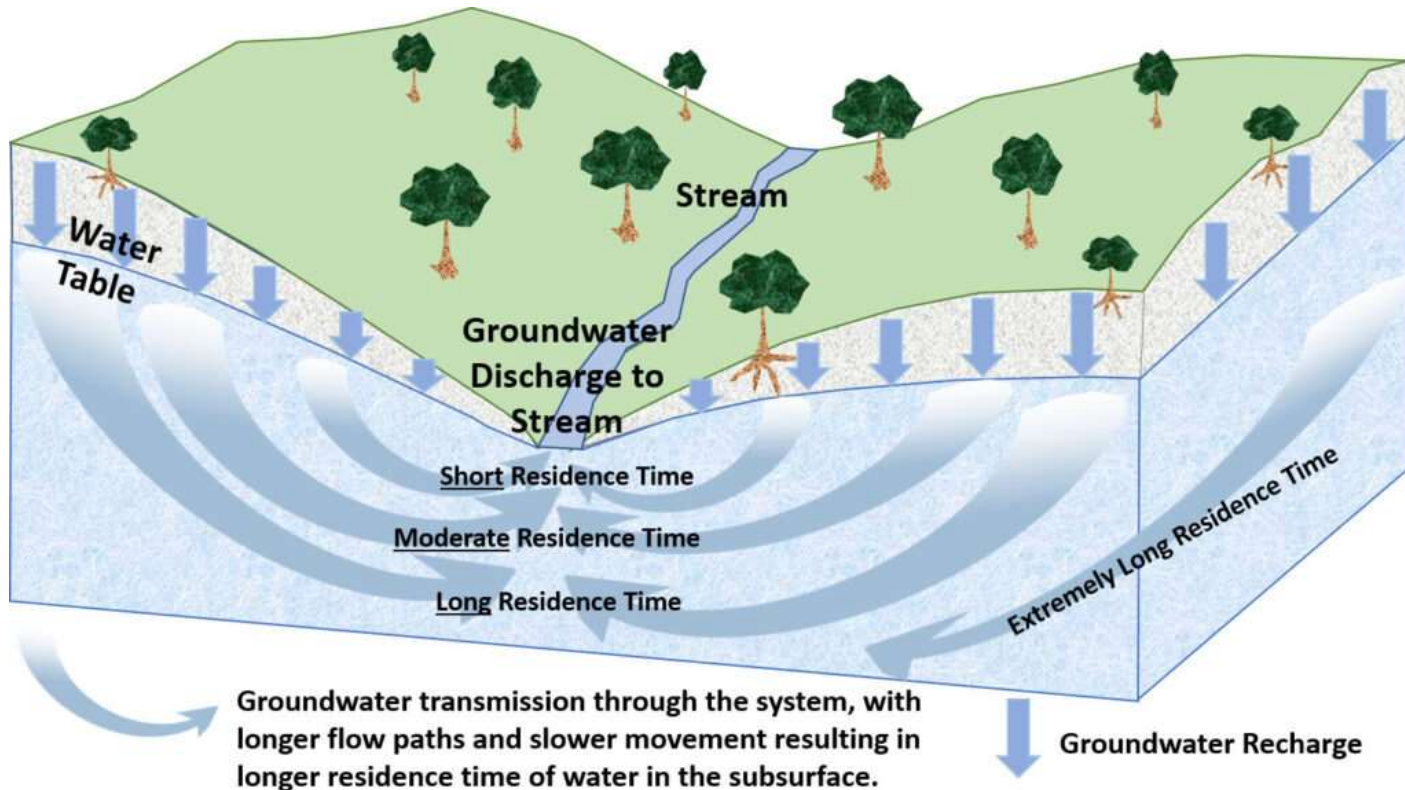
An area of land where all rainfall collects and drains to a single point.

Catchments



An area of land where all rainfall collects and drains to a single point.

Catchments



- The Groundwater Project

Three dimensional nature of catchments

Pathways:

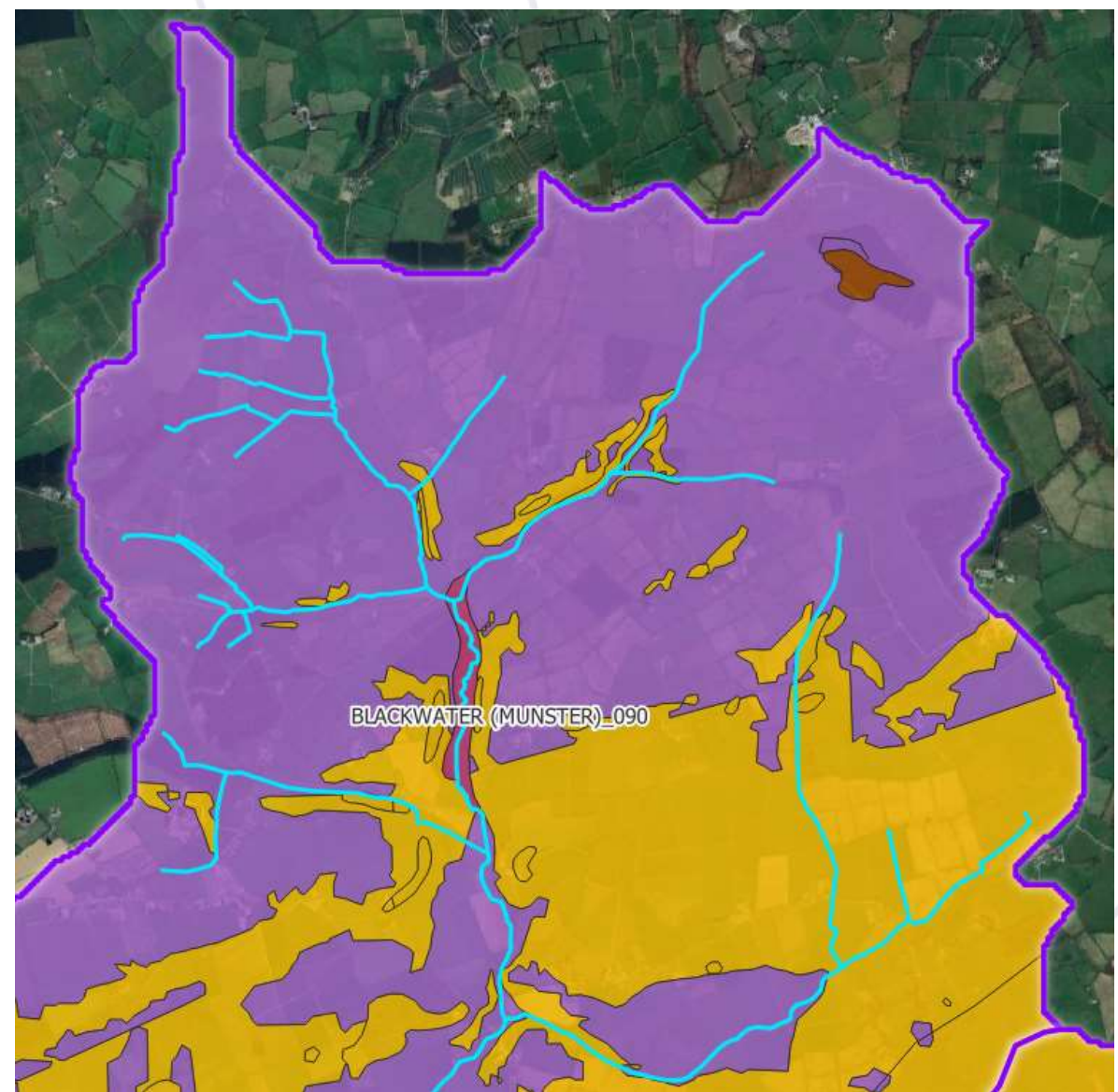
- 1) Surface water
- 2) Groundwater

Catchments

Flow pathway determination:

1) Underlying soil types
- How porous is the soil?

2) Topography
- Natural slopes in the landscape as well as features such as intercepting streams and ditches



Soil Type

AlluvMIN
Made
Peat

Poorly Drained
Water
Well Drained

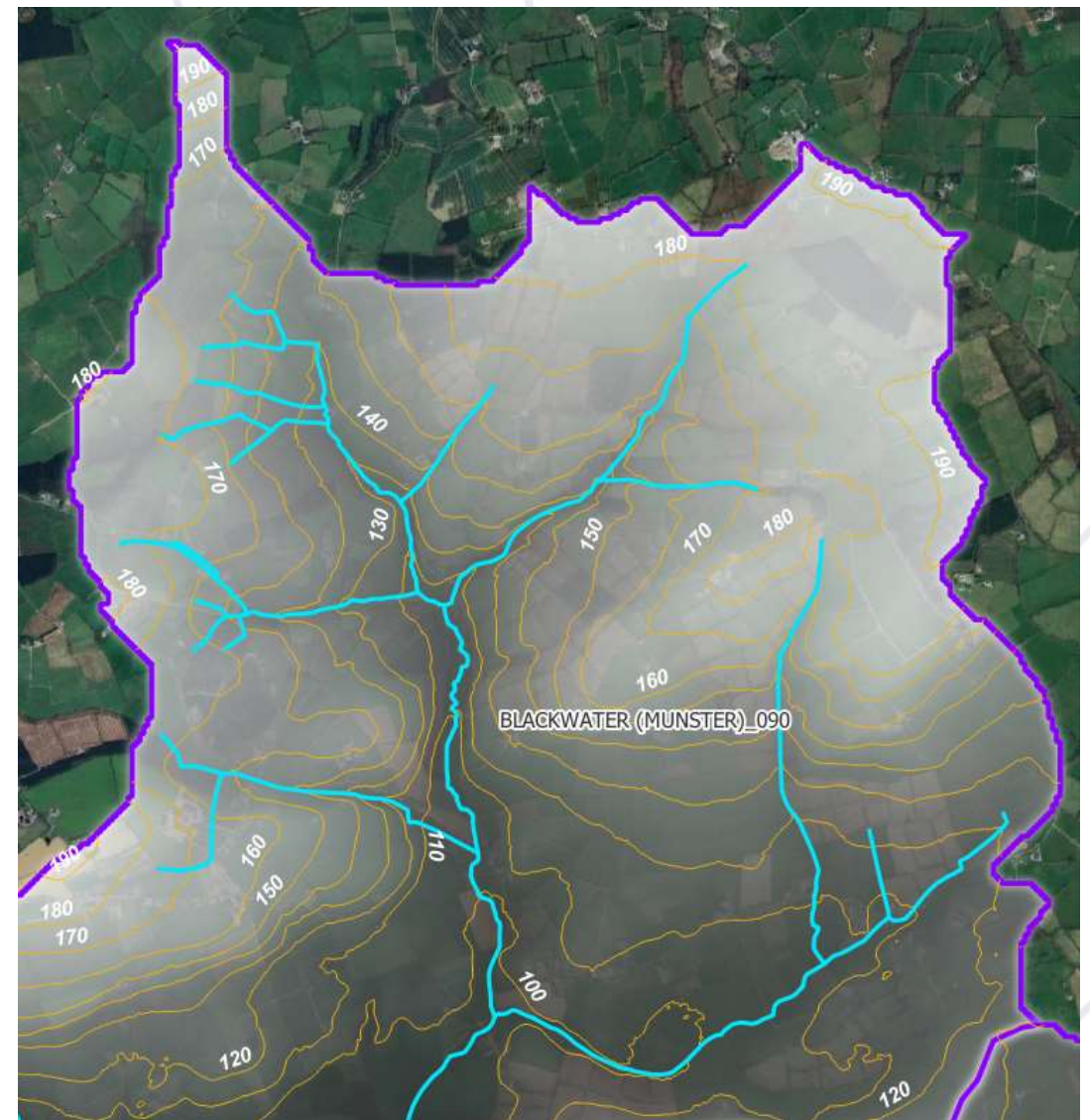



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Catchments

Flow pathway determination:

- 1) Underlying soil types
 - How porous is the soil?
- 2) Topography
 - Natural slopes in the landscape as well as features such as intercepting streams and ditches



 **Awbeg DEM (elevation in m)**

Band 1 (Gray)

202.48

58.65



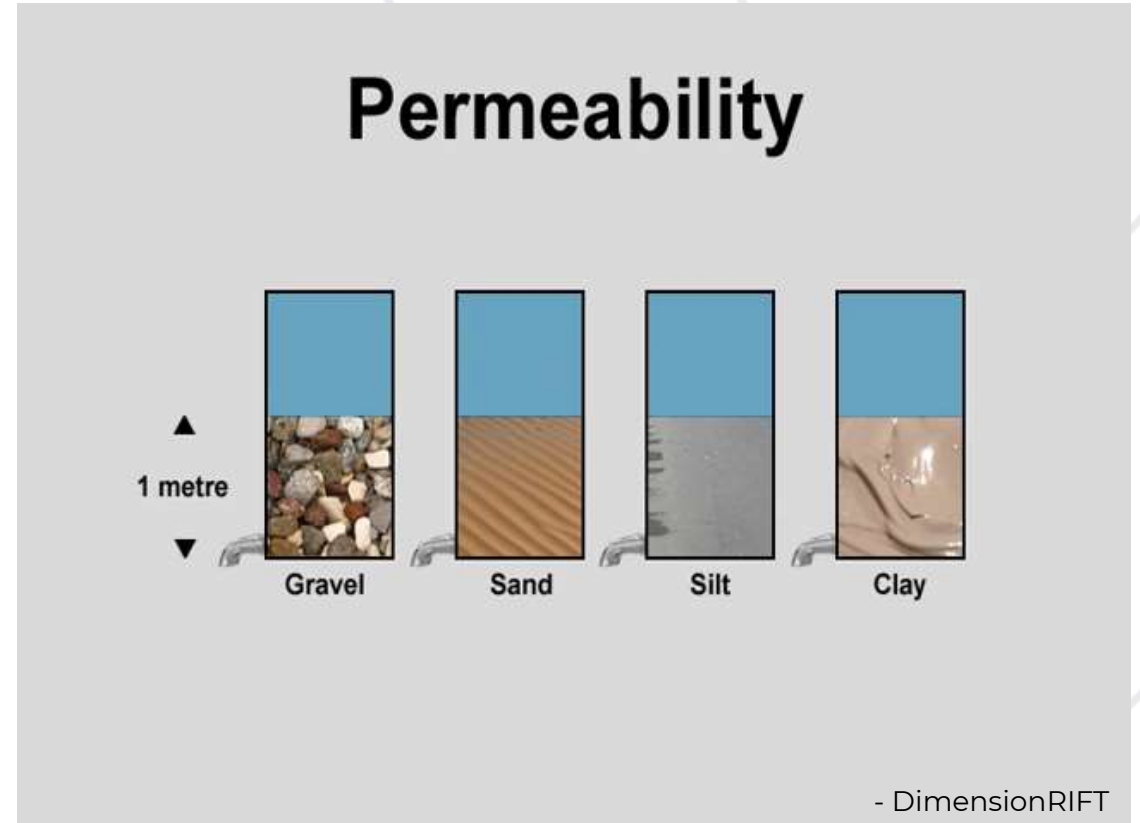
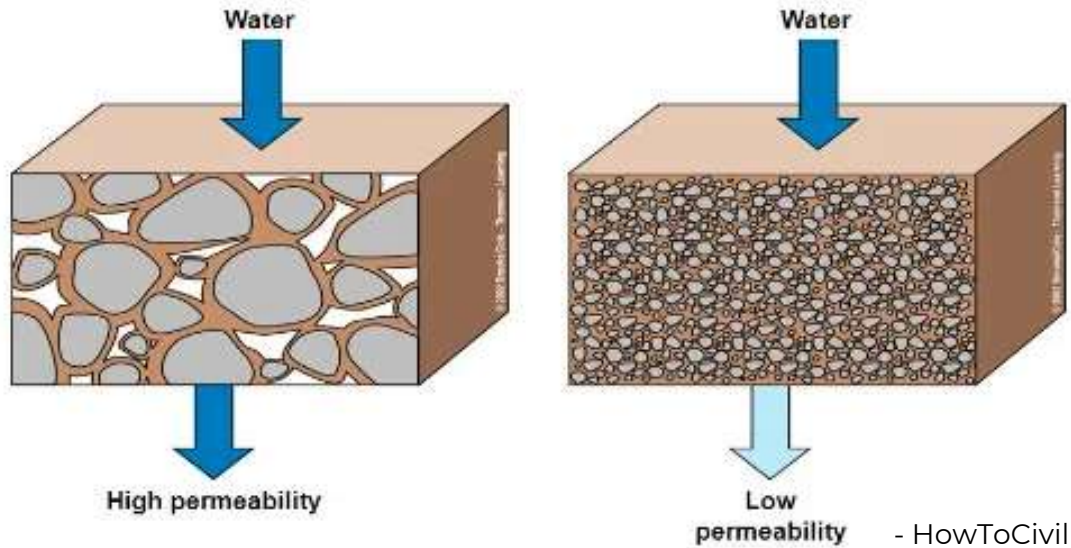
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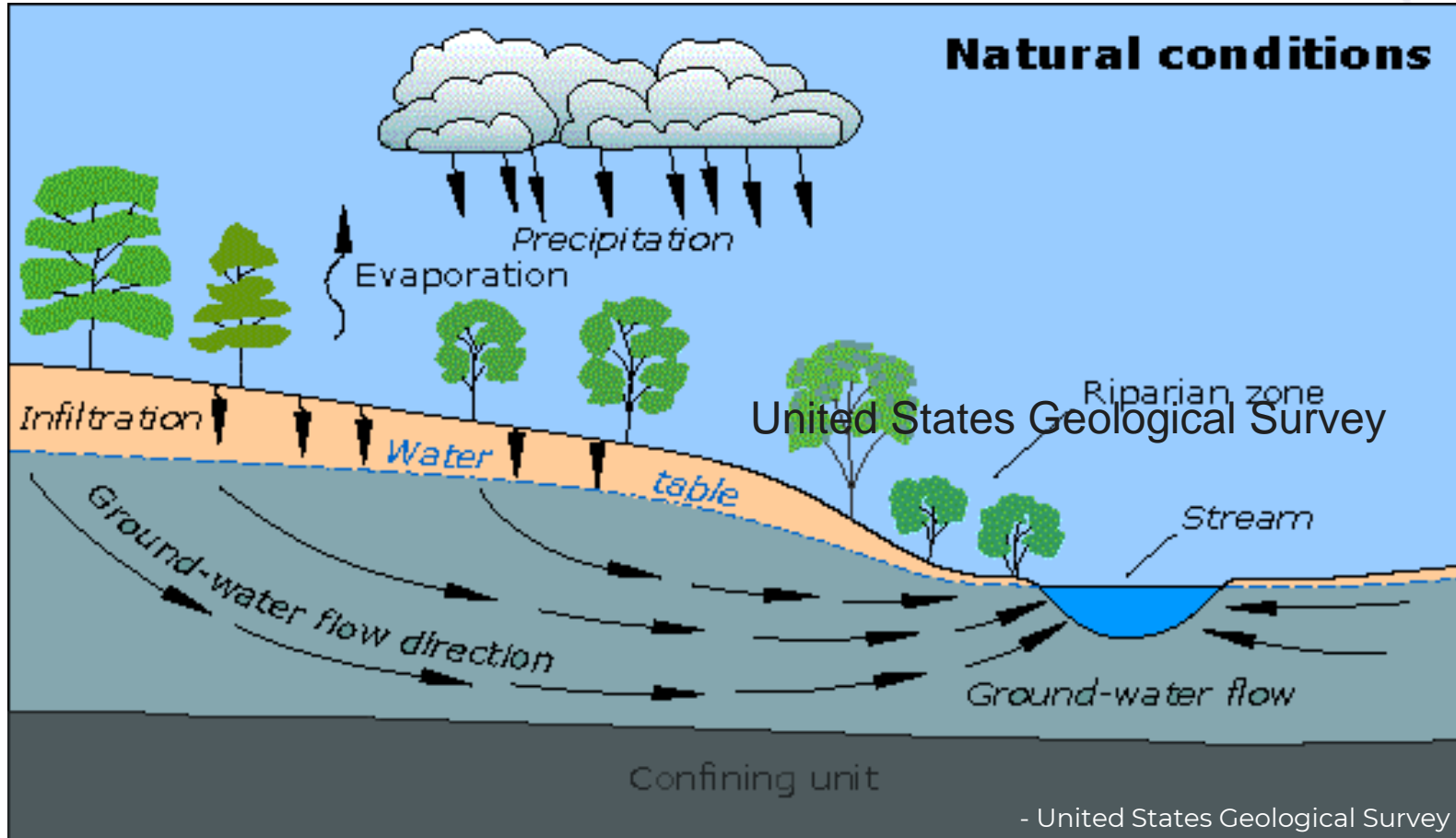
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Soil types

Bigger the grain size, the faster water can flow through subsoil

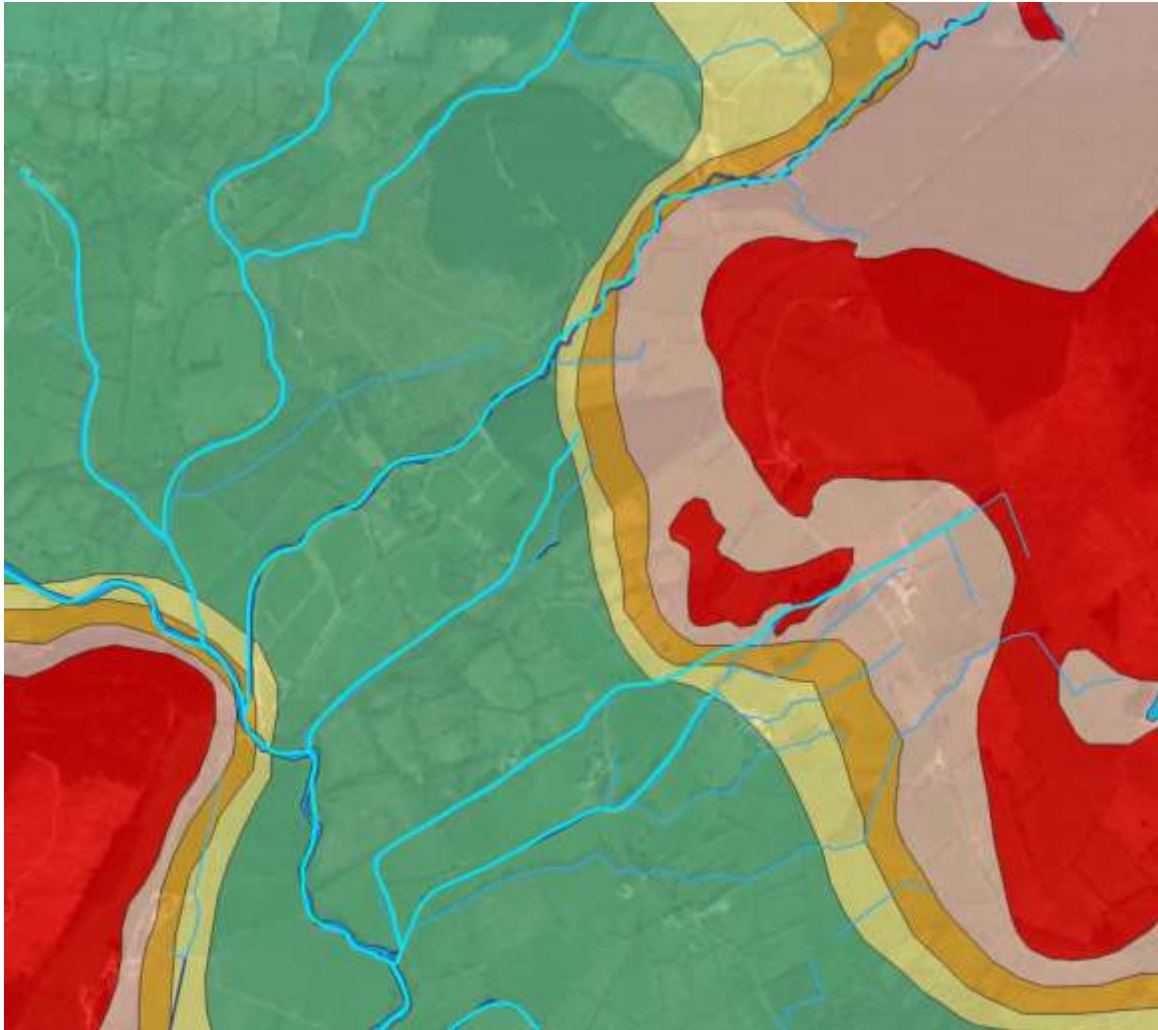


Soil – Aquifer interface



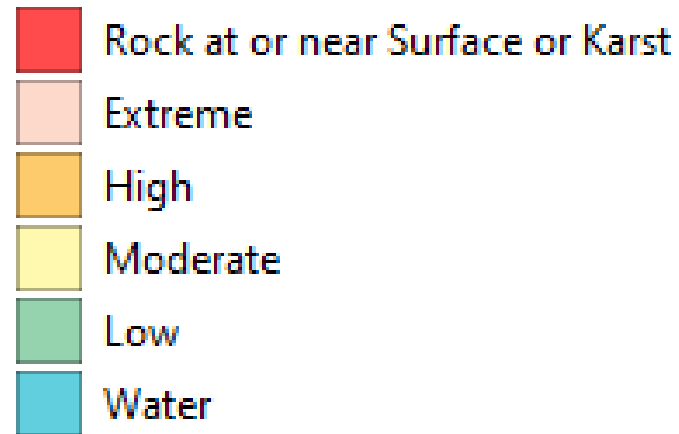
Will have varying levels of speed and direction

Groundwater vulnerability



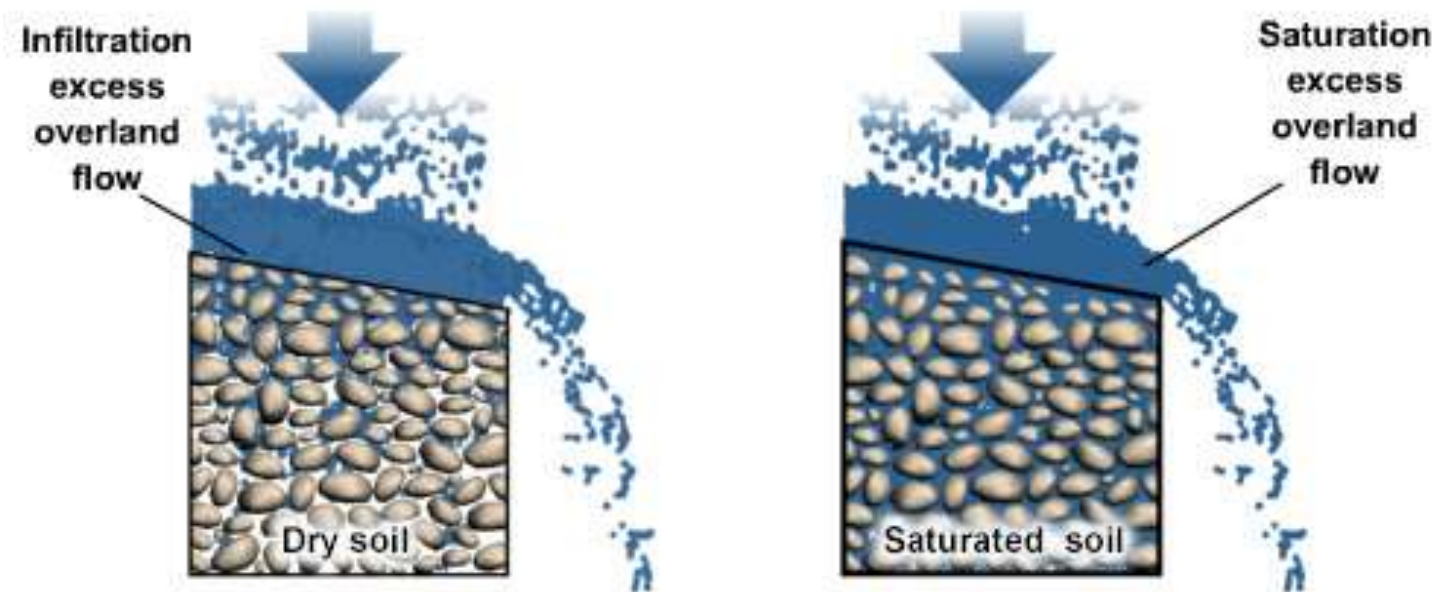
Can water and contaminants move in the subsurface materials (soil and subsoil) and get down to groundwater easily?

GSI Groundwater Vulnerability



Surface pathways

Types of Surface Runoff



Note: Enlarged soil particles are not drawn to scale.

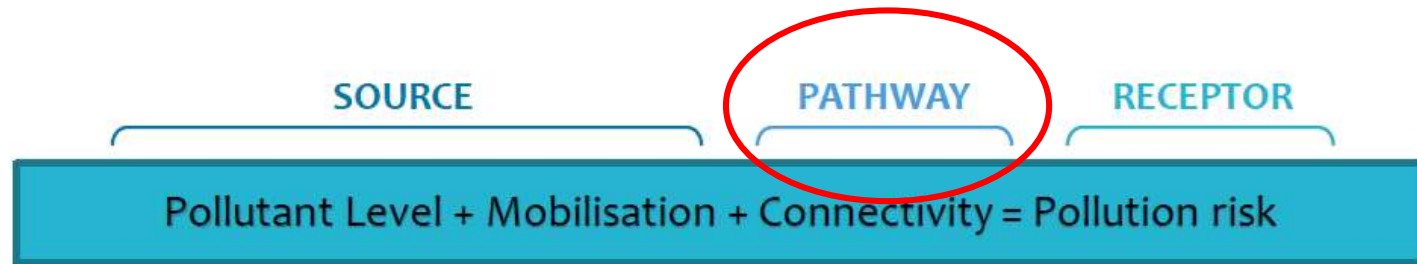
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Path of least resistance:

Once water cannot infiltrate soils it will follow path of least resistance at the surface level

Downhill following topography

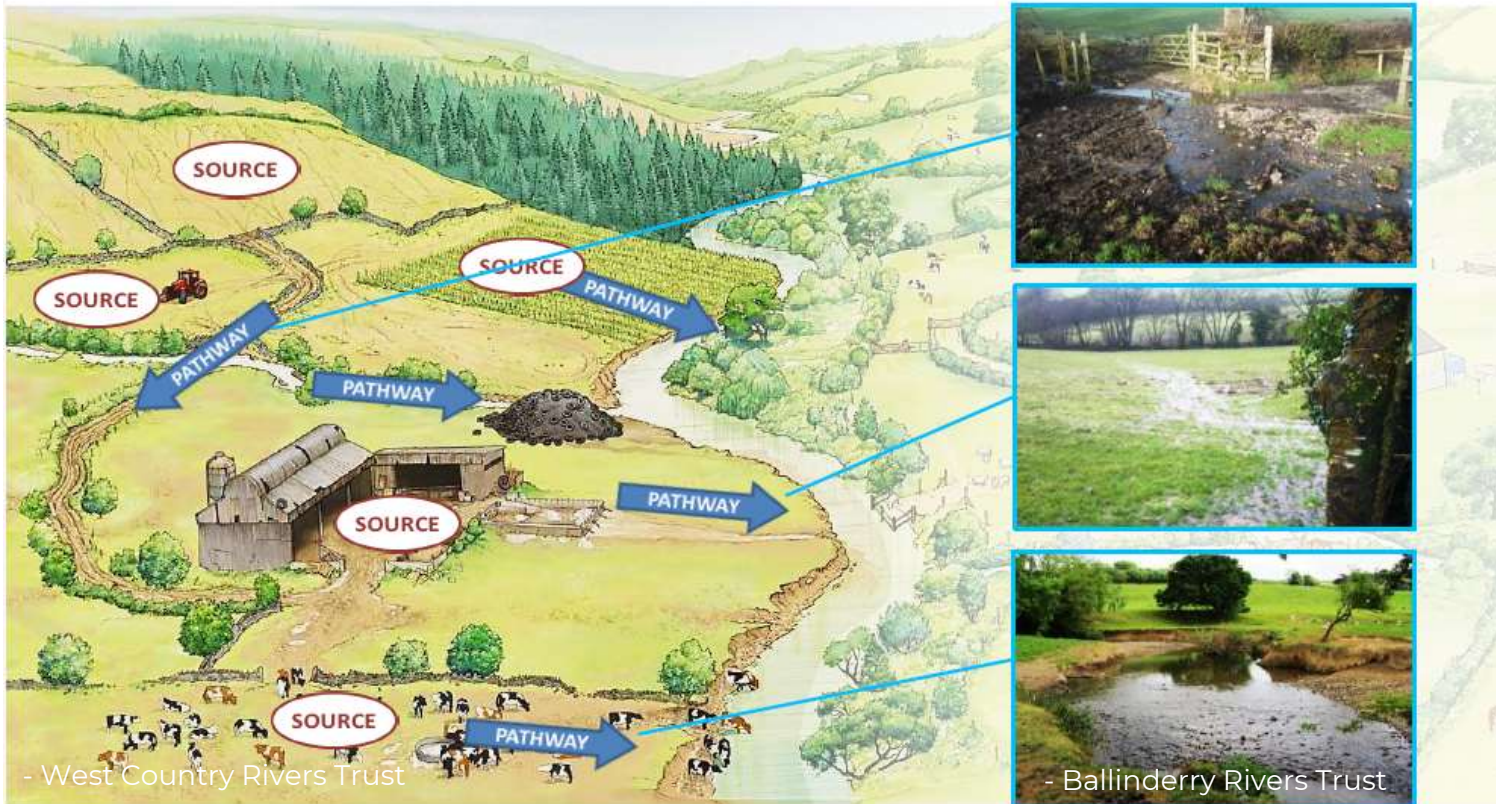
Surface pathways



Path of least resistance:

Once water cannot infiltrate soils it will follow path of least resistance at the surface level

Downhill following topography



- West Country Rivers Trust

- Ballinderry Rivers Trust

Surface pathways

Overland flow pathways



Surface pathways

Overland flow pathways



- Aveland trees

Key takeaways



- All three aspects of source-pathway-receptor are needed for there to be impact
- Catchments drain to a point, are three dimensional with surface and groundwater pathways.
- There are a variety of factors that determine which pathway water will take.

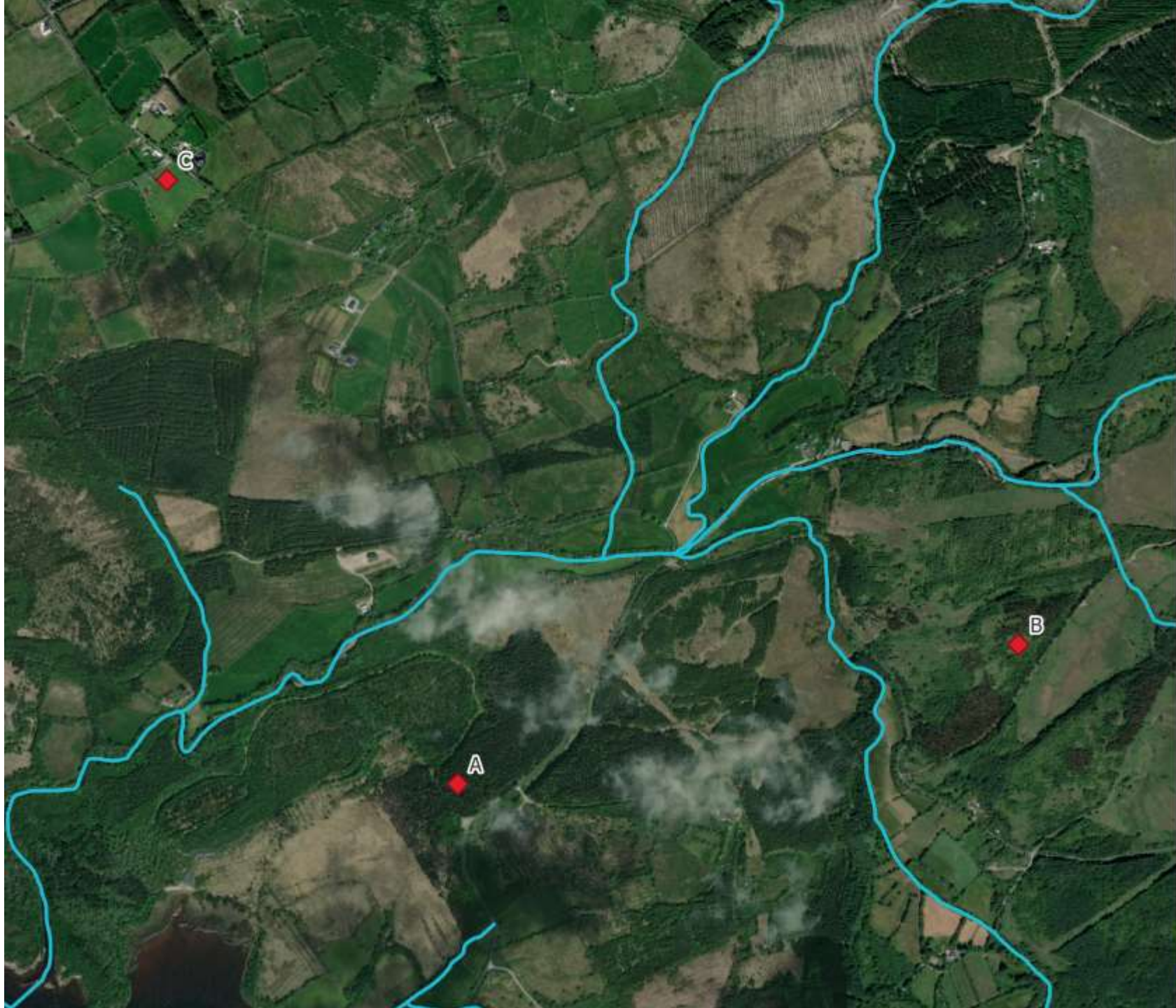


EXERCISE

Tell the story of the pathway showing how water goes from one point to a watercourse.



exercise



Starting Point

◆ Start point

— River network and additional water features

Esri Imagery

0 200 400 m



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exercise



Contours

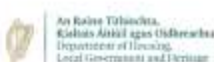
- ◆ Start point
 - River network and additional water features
 - 10m Contour
- Esri Imagery



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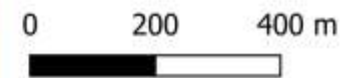
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Soil Map

- ◆ Start point
- River network and additional water features
- Soil Type
 - AlluvMIN
 - Peat
 - Poorly Drained
 - Water
 - Well Drained
- Esri Imagery



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exercise

