Strategies of conceptual model development

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Joint actions for more efficient management of common groundwater resources

The Risk Based Management of WFD

- Risk Assessment

Not the classical approach – risk to human health, etc

In WFD:

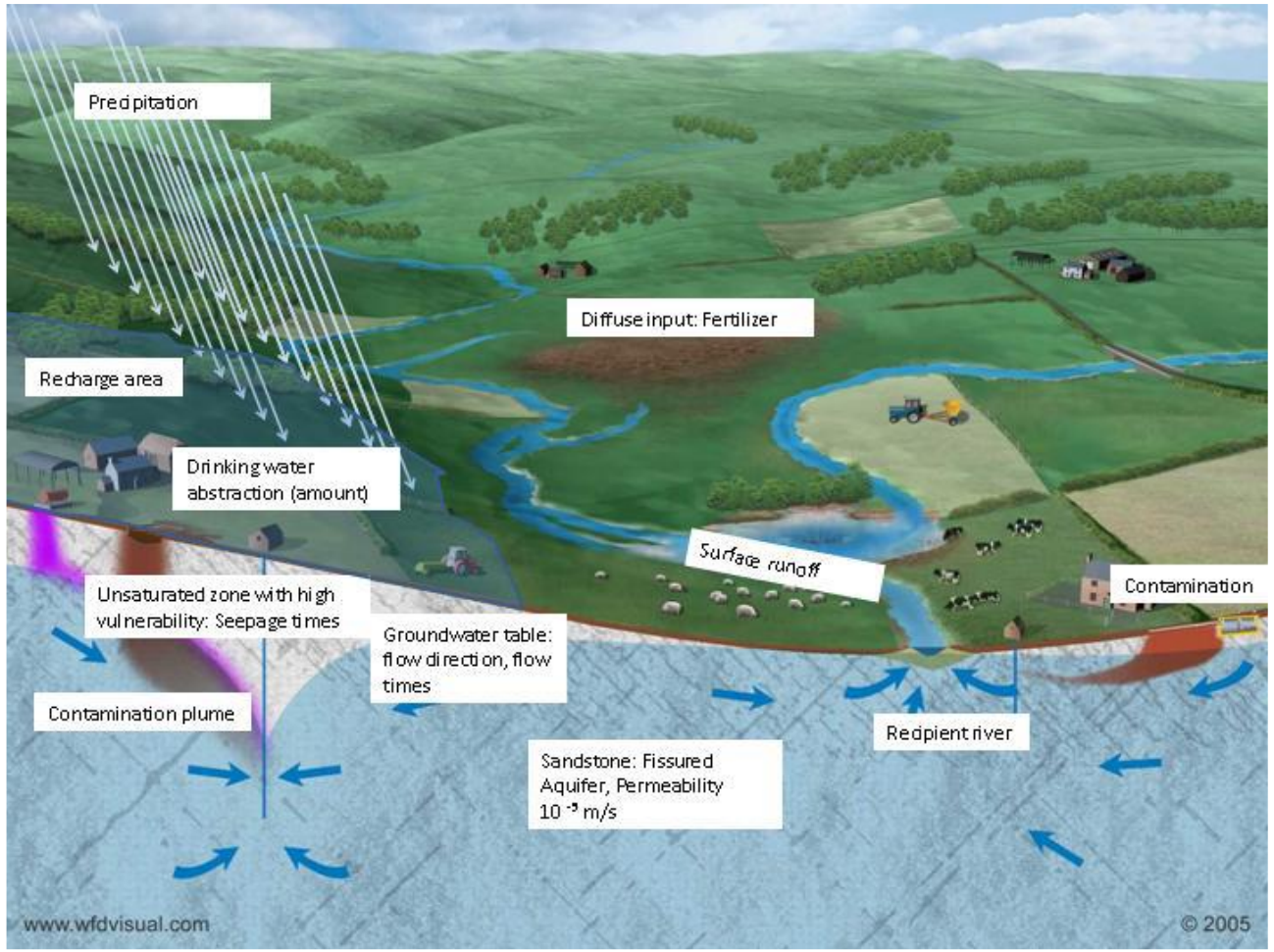
Risk not to achieve the environmental objectives of the WFD

Groundwater objectives in WFD

1. Prevent or limit the input of pollutants;
2. Prevent the deterioration of status of groundwater bodies;
3. Achieve good groundwater status (both chemical and quantitative);
4. Implement measures to reverse any significant and sustained upward trend;
5. Meet the requirements of protected areas.

How to assess risk?

1. Scale is diferent;
2. Objectives are different;
3. Pressures are different;



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Source-Pathway-Receptor (SPR) model

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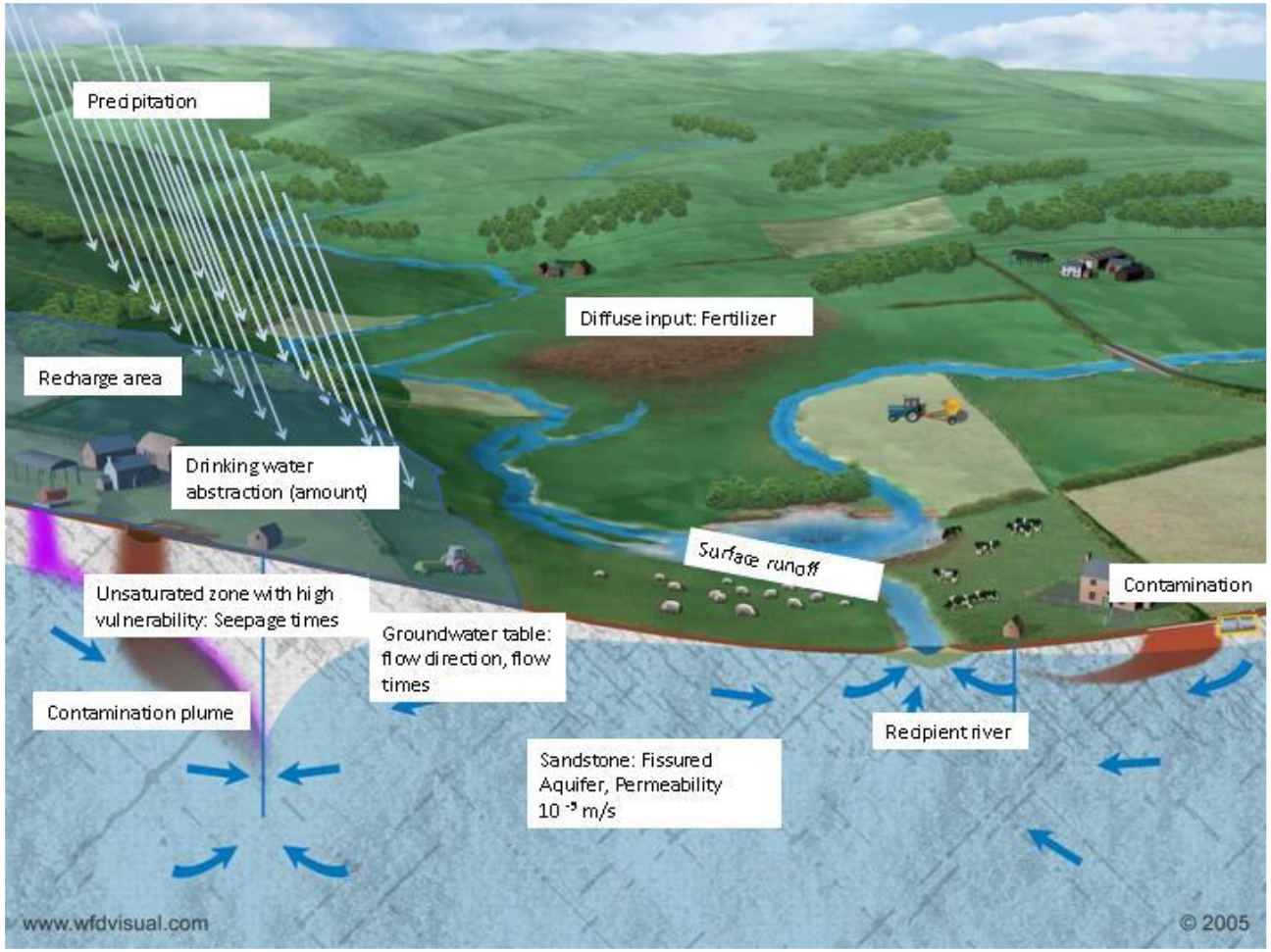


Conceptual models

1. Definition:

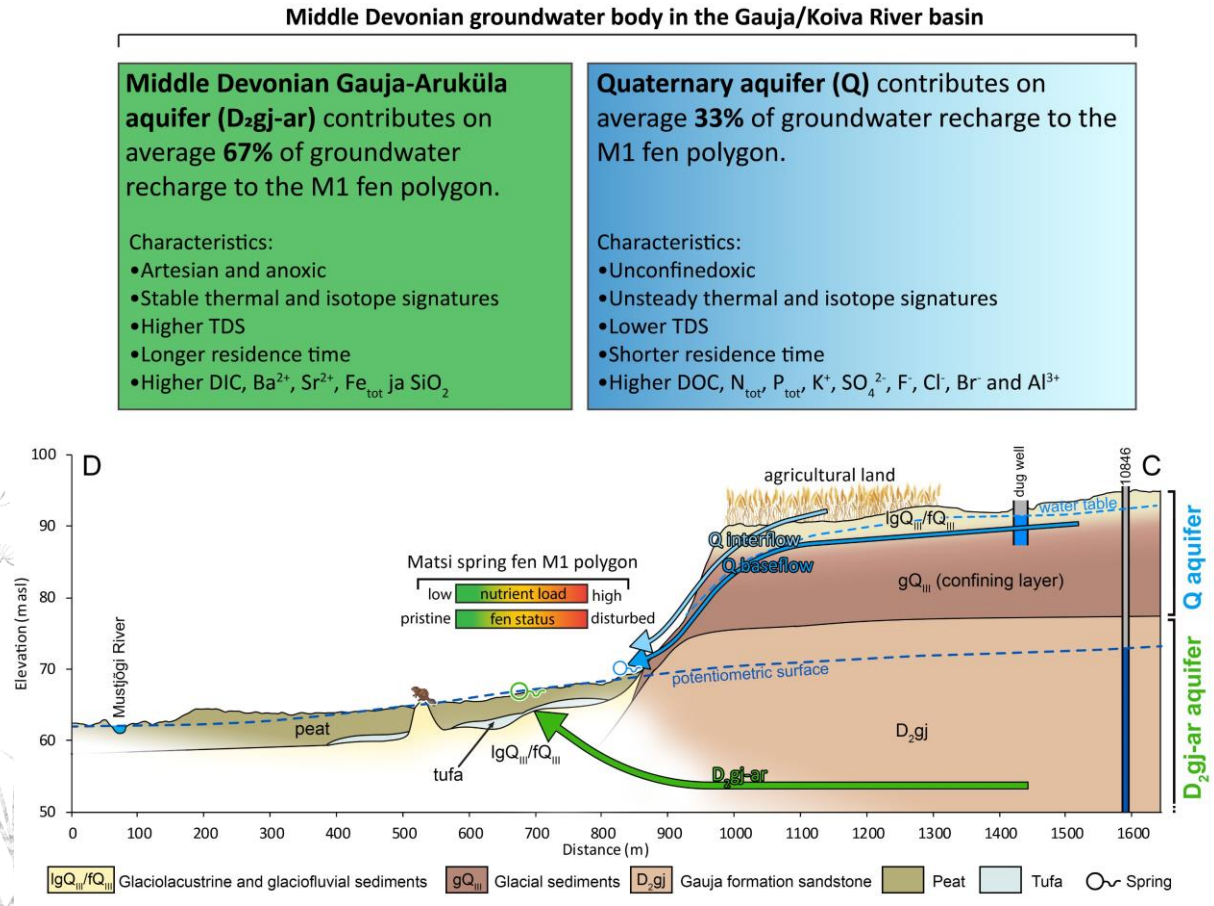
a conceptual model is a tool for describing and optionally quantifying systems.

A hydrogeological conceptual model describes and quantifies:

- relevant geological characteristics;
- flow conditions (groundwater/surface water interaction);
- hydrogeochemical and hydrobiological processes;
- anthropogenic activities and their interactions.

So What?

Conceptual models are useful in:



- understanding the significance of pressures;
- design of a monitoring network;
- interpreting monitoring data;
- evaluating the monitoring network;
- establishing threshold values;
- status assessment;
- trend assessment;
- plan of measures;
- stakeholder involvement.

The set-up of a Conceptual Model

Why?

Main characteristics:

1. Scope and questions to be answered - to determine the degree of detail and complexity of the conceptual model;
2. Determination of the relevant area;
3. Definition of vertical and horizontal structuring units (hydrogeological units);
4. Land use distribution.

The set-up of a Conceptual Model

What?

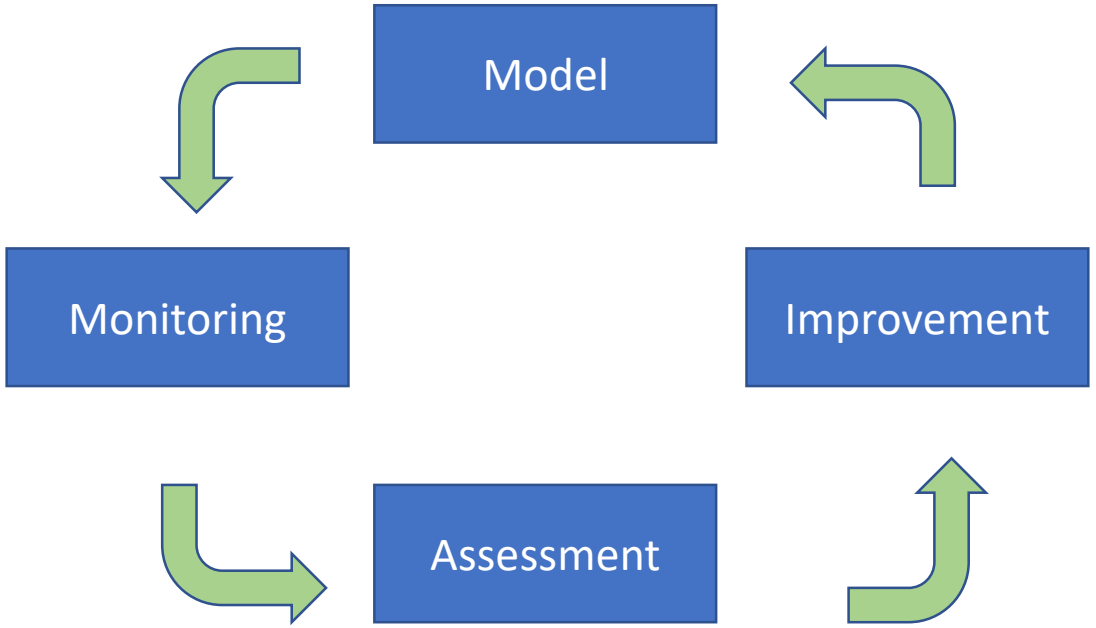
Parameterisation/quantification:

- Description and quantification of important hydraulic, geochemical and hydrochemical parameters introduced where possible and necessary;
- Consideration of processes with slow kinetics (e.g. solution processes, unsaturated zone flow, changes in surface conditions, climate variations);
- Description of the most important climatic and unsaturated zone parameters;
- Identification of emerging issues that could pose a potential risk.

The set-up of a Conceptual Model

Recycle!

1. Start with simple model;
2. Collect data;
3. Analyse performance;
4. Assess uncertainties;
5. Improve the model.



Recycling of a Conceptual Model

Remember your goals:

Recycling of a Conceptual Model

Remember your goals:

What is the risk of not meeting the environmental objectives of the WFD?

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What next?

Recycling of a Conceptual Model

Remember your goals:

What is the risk of not meeting the environmental objectives of the WFD?

What next?

Risk management, AKA The Plan of Measures:

Where to initiate which measures and what are their effects in time and space.

- A Happy Water Management!

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bit.ly/WaterAct-project

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