

READINGS / REFERENCES

1. Ford, D. and Williams, P. 2007. Karst Hydrogeology and Geomorphology. John Wiley & Sons Ltd.
2. Pekcan, N. 2019. Karst Jeomorfolojisi (3. Baskı). Filiz Kitapevi, İstanbul
3. Erinç, S., 2001, **Jeomorfoloji I**, Der Yayınları, İstanbul.
4. Huggett, R.J., 2013. **Fundamentals of Geomorphology**. Third edition.
5. Huggett, R.J., 2015, **Jeomorfolojinin Temelleri** (Çeviri Editörü: Prof. Dr. Uğur Doğan), Nobel Akademik Yayınları, Ankara.

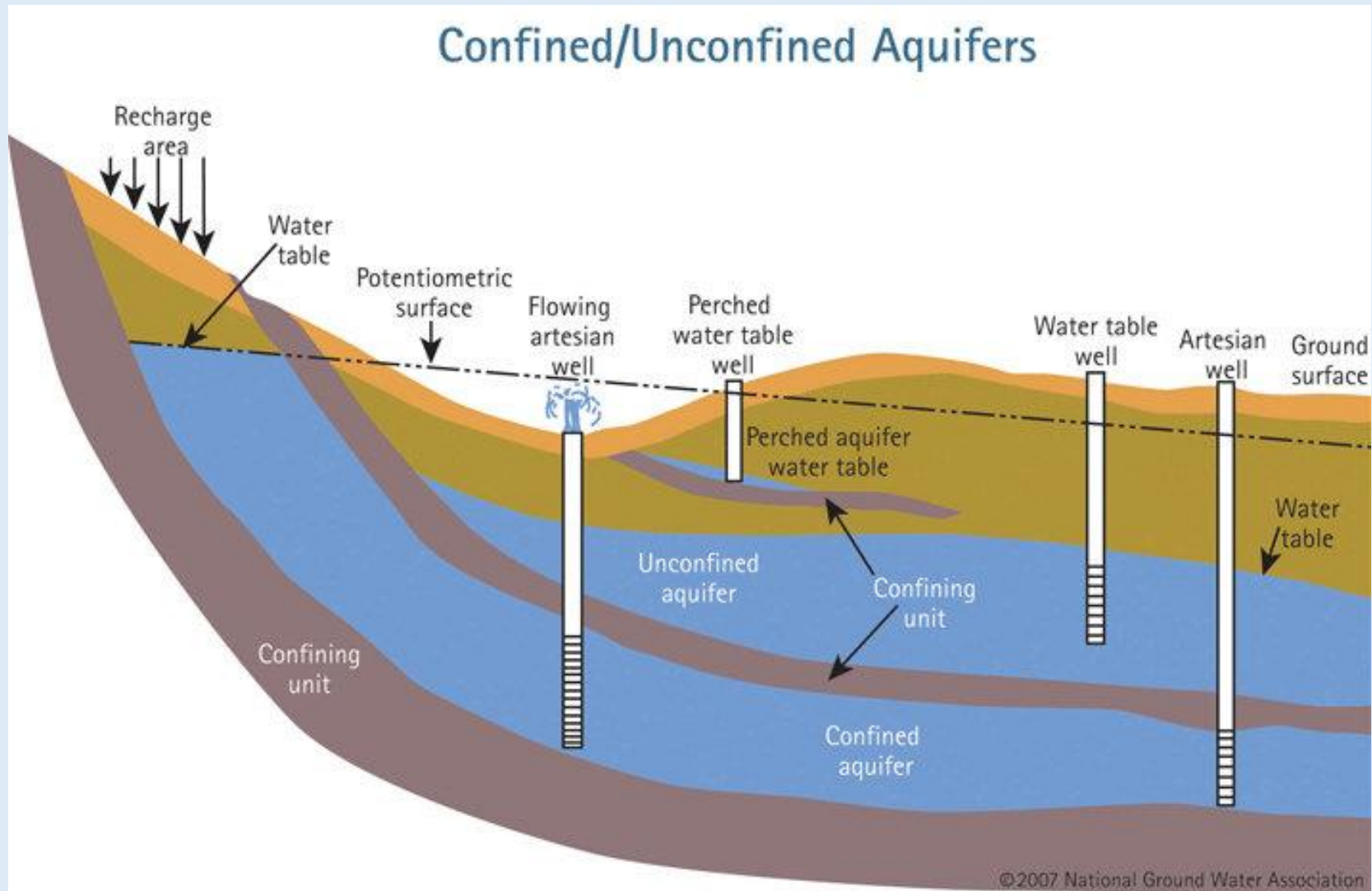
Course Contents

1. Introduction to Karst Geomorphology
2. Karst Rocks / Soluble Rocks and Karst Processes
- 3. Karst Hydrology, Karst Drainage System**
4. Karst Landforms: Karren
5. Karst Landforms: Doline, Sinkhole and Blind valley
6. Karst Landforms: Swallow hole, karst spring
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8. Speleology, Caves, Speleothem
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10. PsödoKarst, Termokarst (kryokarst)
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Karst Hydrology

Aquifer

Aquifer is saturated layers of sediment and bedrock where underground water can move and stored. These structures where water is stored are permeable and porous materials such as sandy, gravel or limestone.



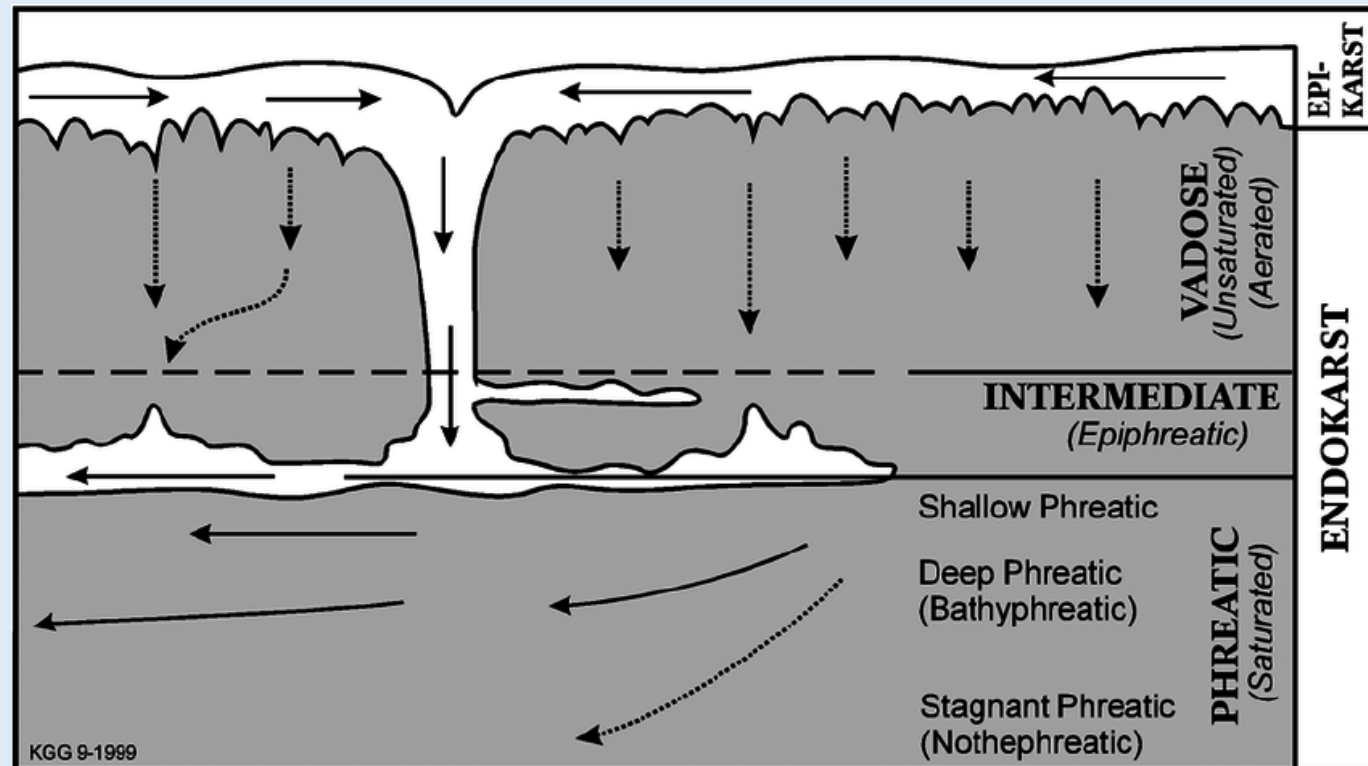
Kersting, 2018. Dating of groundwater and ocean samples with noble gas radioisotopes – sample preparation and field applications.
https://www.researchgate.net/publication/326170856_Dating_of_groundwater_and_ocean_samples_with_noble_gas_radioisotopes_-_sample_preparation_and_field_applications

Karst Hydrology

Vadose zone (unsaturated zone) is a subsurface layer of soil or rock that lies between the land surface and the water table (top of the saturated zone).

Epiphreatic zone (floodwater zone) interface between groundwater and the overlying rock layers, particularly in karstic environments.

Phreatic zone or saturated zone, is the part of an aquifer, below the water table, in which relatively all pores and fractures are saturated with water.



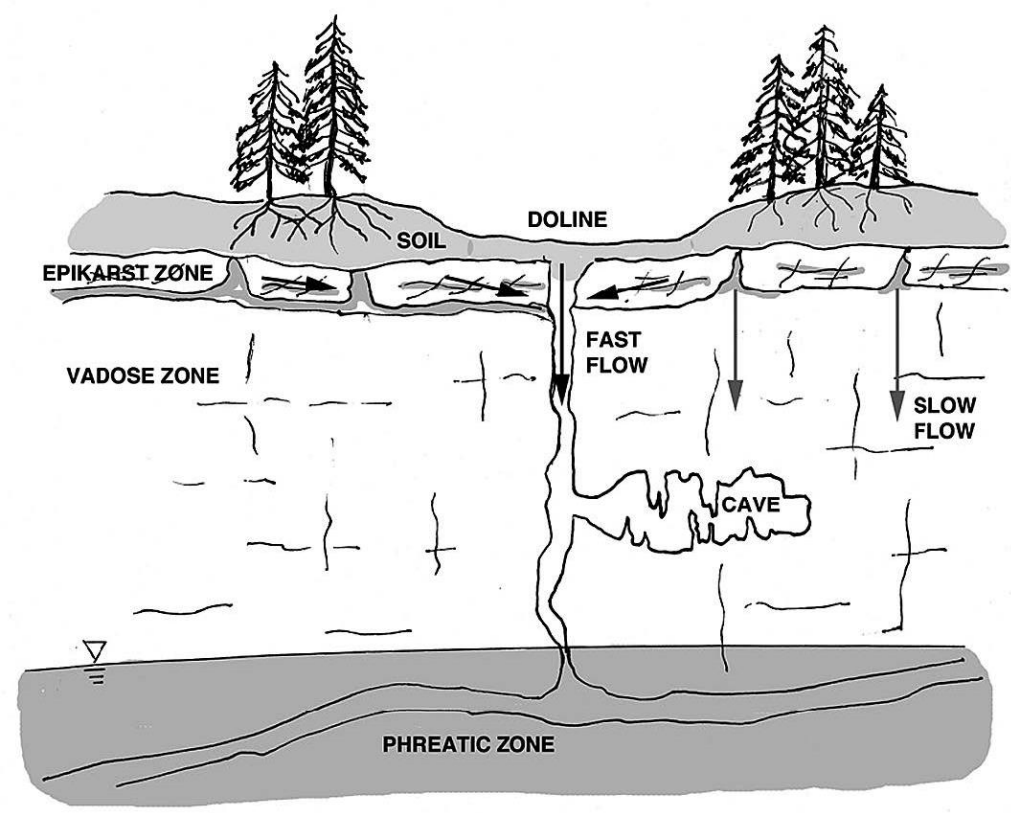
https://www.researchgate.net/publication/265168388_The_Water_Below_An_introduction_to_karst_hydrology_and_the_hydrological_setting_of_the_Australian_karsts?channel=doi&linkId=5403bf390cf2c48563b03066&showFulltext=true

Karst Hydrology

The circulation of karst groundwater can only occur when underground connections exist between elevated regions and valley floors; otherwise, surface runoff will simply flow across the terrain.

In porous bedrock, such as many sandstones, water seeps into the ground and moves through interconnected pores, eventually emerging at the surface as springs. In these types of rocks, water movement occurs through laminar flow, and chemical dissolution does not significantly impact the storage capacity and transmission of groundwater.

The same forces that drive underground groundwater circulation in other types of rocks also affect karst rocks. This is because dissolution is a fundamental process in karst formations. As groundwater circulates, void spaces gradually enlarge due to dissolution, leading to increased permeability. While initial groundwater flow in karst is laminar, it becomes increasingly turbulent over time. This evolutionary process distinguishes karst groundwater systems from others.



<https://ojs.zrc-sazu.si/carsologica/article/view/672>

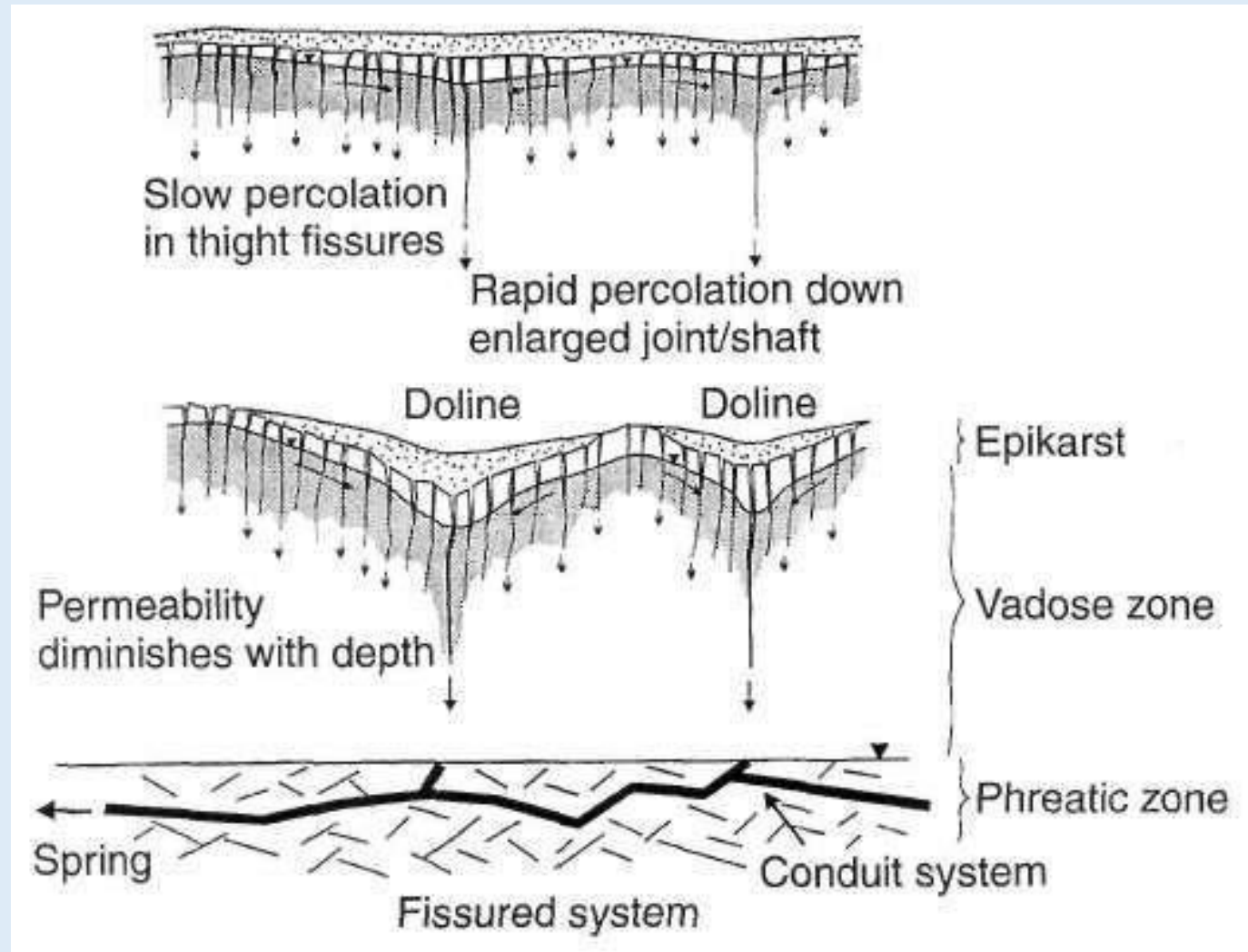


<https://twitter.com/IsaiSupertramp/status/1404188189271678978>

Karst Hydrology

Epikarst

The epikarst represents the transitional area between the infiltration zone and the soil and plant cover in karst landscapes. It comprises the uppermost layer characterized by more pronounced fracturing compared to the underlying infiltration zone, influenced by rock constraints, climate, and vegetation.



Karst Hydrology

Comprehensive karst system approach may involve studying not only the geological features such as caves, sinkholes, and underground drainage networks but also considering the hydrological, ecological, and environmental aspects of karst regions. This could include investigating how water moves through karst aquifers, the interactions between surface and subsurface water systems, the biodiversity supported by karst ecosystems, and the vulnerability of karst landscapes to human activities and environmental changes.

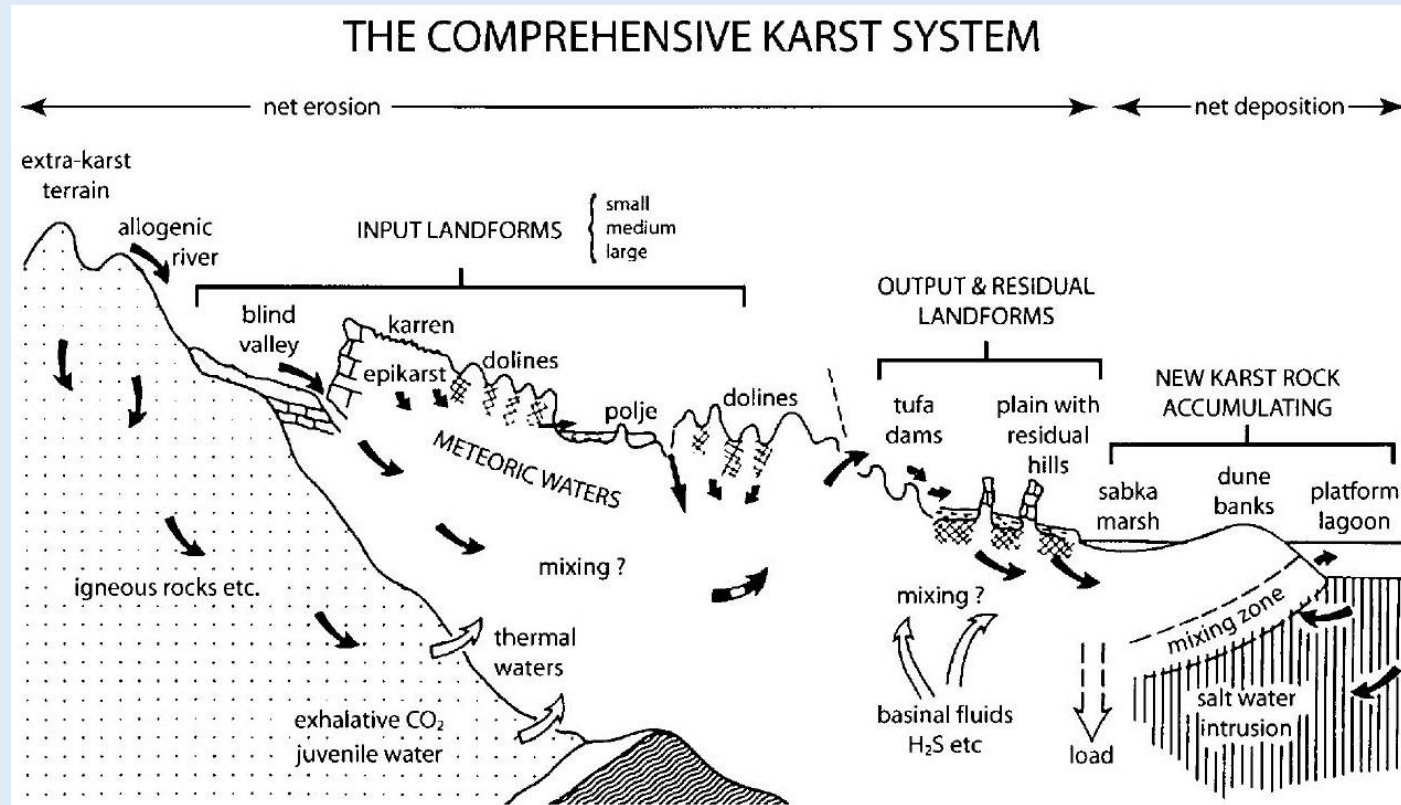


Figure 1.2 The comprehensive karst system: a composite diagram illustrating the major phenomena encountered in active karst terrains. Reproduced from Ford, D.C. and Williams, P.W. (1989) *Karst Geomorphology and Hydrology*.

Ford, D.C., Williams, P.W. 2007. *Karst Hydrogeology and Geomorphology*. John Wiley & Sons Ltd

Karst Hydrology

