

Ankara University  
Faculty of Languages and History-Geography  
Department of Geography

# (GGR324) Karst Geomorphology

*Instructor: Dr. Serdar Yeşilyurt*

## 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
7. Karst Landforms: Polje
8. Speleology, Caves, Speleothem
9. Gypsum Karst
10. Psödokarst, Termokarst (kryokarst)
11. Karst Hazards

# Requirements for Karstification

1. Soluble Rock / Karst Rock (Lithology)
2. Fractured Rock and Joints (Tectonics)
3. Precipitation / Temperature (Climate)
4. Time
5. Topography / Altitude / Elevation
6. Hydrology (Climate)
7. Vegetation / Soil (Climate-Geology)

# Karst Rocks

Karst landforms, which form on **evaporites**, **carbonates**, and some **silicate rocks**, encompass around 20% of the Earth's land surface.



According to some scientists, karst is characterized as a landscape where chemical dissolution surpasses mechanical processes.

# Karst Rocks

- Limestone / **Kireçtaşı** / **Kalker**
- Dolomite / **Dolomit**
- Chalk / **Tebeşir**
- Gypsum / **Jips** / **Alçıtaşı**
- Salt / **Tuz** / **Halit**



© geology.com

<https://geology.com/minerals/dolomite.shtm>



# Karst Rocks

➤ Limestone/**Kalker/Kireçtaşı**

$\text{CaCO}_3$

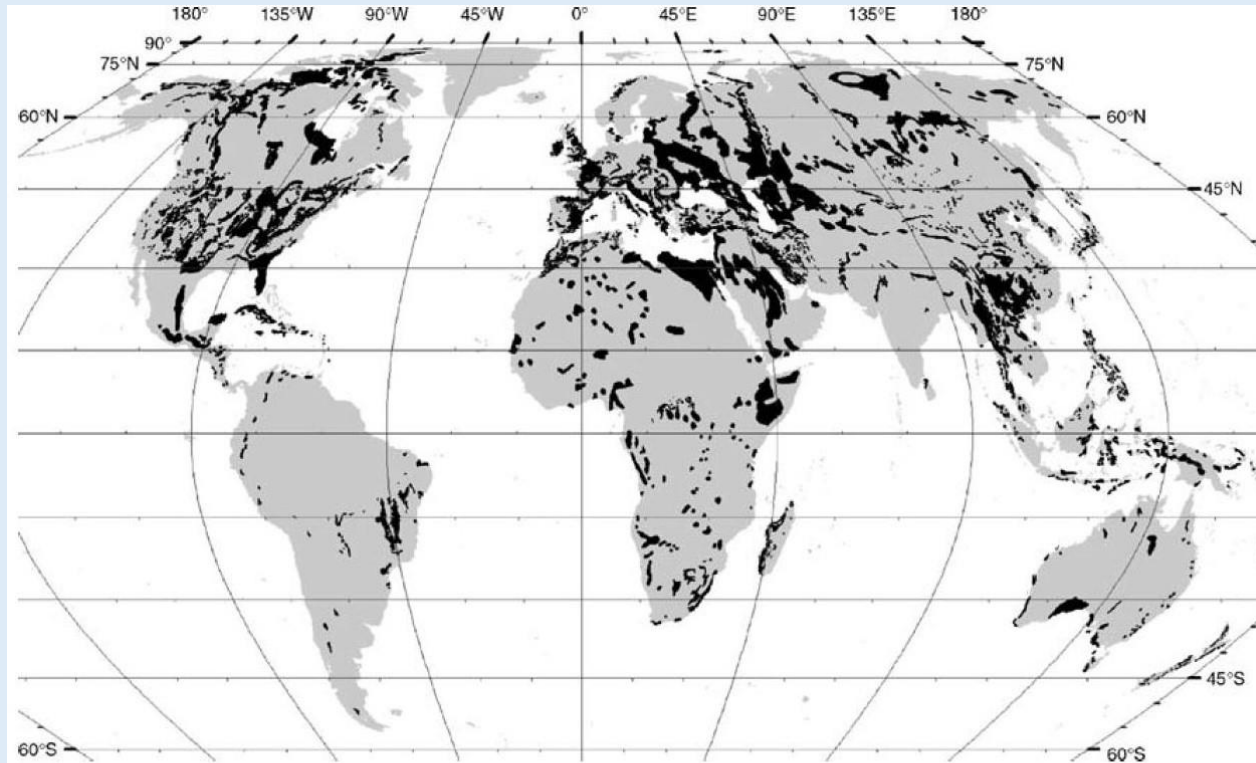
Carbonate rocks are exposed on approximately 13% of the Earth's land surface, excluding regions covered by ice. Roughly a quarter of the world's population resides in these areas or experiences the unique hydrological characteristics associated with them.



# Karst Rocks

➤ Limestone/**Kalker**/**Kireçtaşı**

## Carbonate rocks



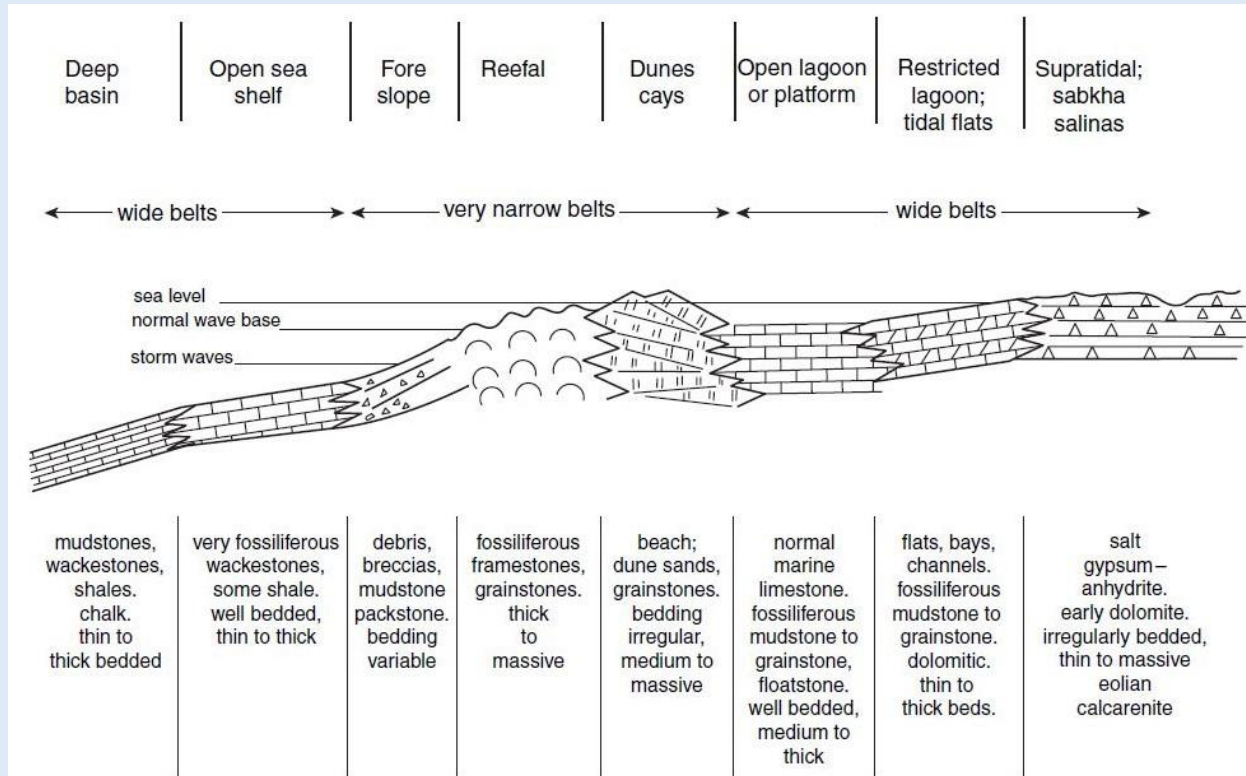
**Figure 1.1** Global distribution of major outcrops of carbonate rocks. Accuracy varies according to detail of mapping. Generalization occurs in areas with interbedded lithologies and where superficial deposits mask outcrops. (Map assembled using GIS on Eckert IV equal-area projection from regional maps, many of which were subsequently published in Gunn (2000a)).

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



## ➤ Limestone/**Kalker**/**Kireçtaşı**

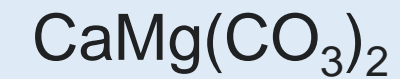
### CaCO<sub>3</sub>



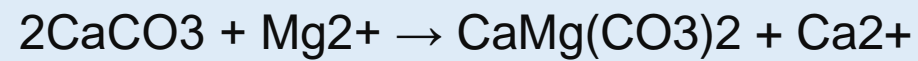
**Figure 2.4** (a) Different types of carbonate platforms. Reproduced with permission from Tucker, M.E. and Wright, V.P., Carbonate Sedimentology, Blackwell Science, Oxford © 1990 Blackwell Science. (b) A composite facies model to illustrate deposition of limestone, early dolomite and evaporite rocks on a rimmed shelf and ramp. This is a generalized, simplified picture. Not all facies will be present in any given transect. Narrow belts range from a few metres to a few kilometres in width, whereas wide belts range from hundreds of metres to more than 100 km. Modified with permission from Wilson, J.L. (1974) Characteristics of carbonate platforms margins, Bulletin, 58, 810–24. © 1974 American Association of Petrologists.

## Karst Rocks

➤ Dolomite/**Dolomit**



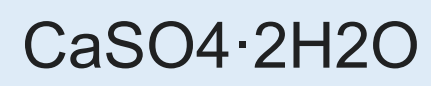
Dolomitization Reaction



<https://m.indiamart.com/proddetail/dolomite-mineral-stone-24338173697.html>

# Karst Rocks

➤ Gypsum/**Jips**/**Alçıtaşı**



➤ Anhydride/**Anhidrit**



# Karst Rocks

➤ Salt/**Halit**/Tuz

NaCl



[https://mikon-online.com/mikon\\_en/mineralien-einzelhandel/e-h/h/halite-x-volkenroda-thueringen-d-ks.html](https://mikon-online.com/mikon_en/mineralien-einzelhandel/e-h/h/halite-x-volkenroda-thueringen-d-ks.html)

# Karst Rocks

## ➤ Chalk



Chalk generally consists predominantly of nearly pure calcite,  $\text{CaCO}_3$ , along with only 2% to 4% of other minerals.



**Beachy Head**

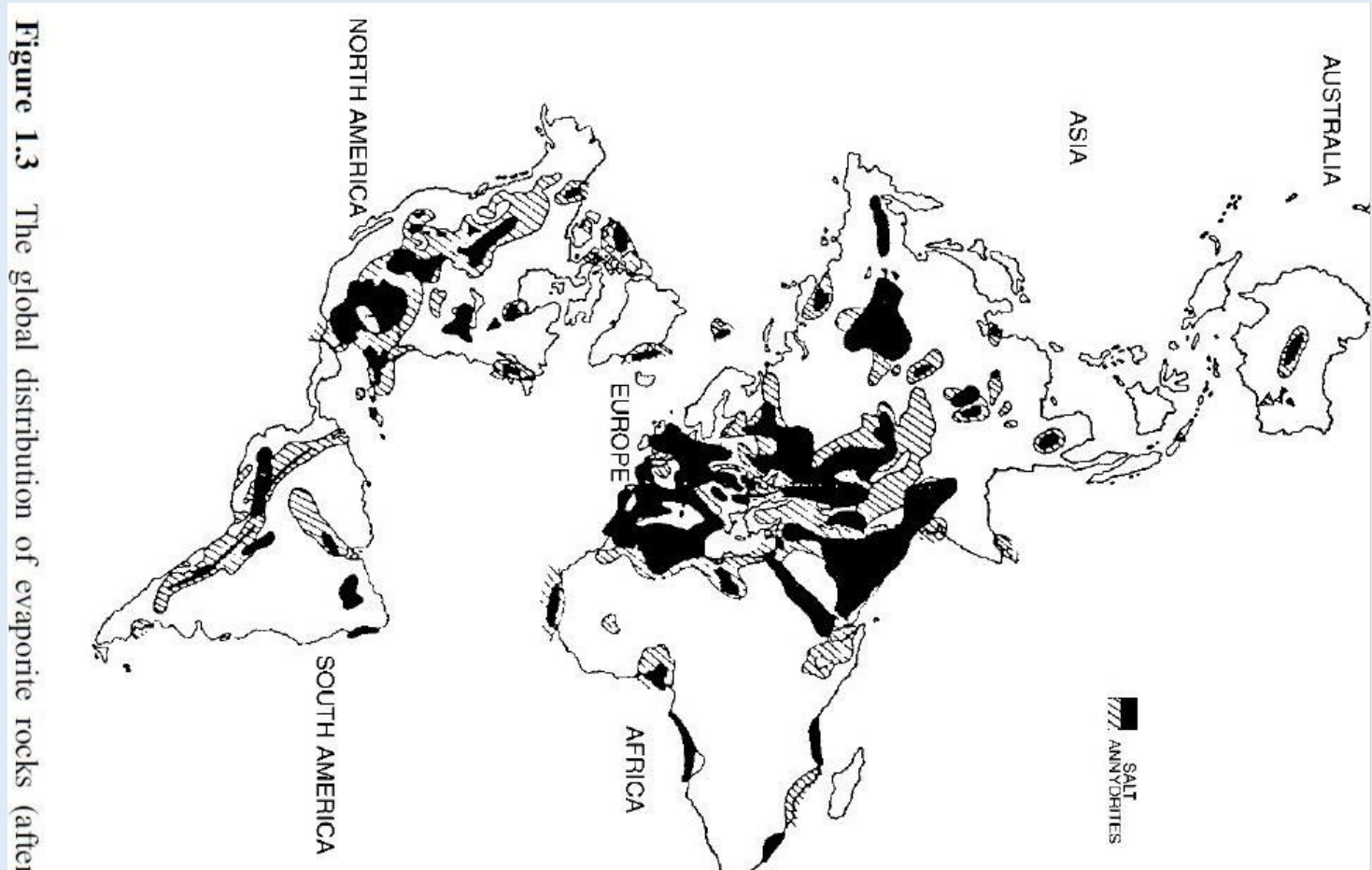
<https://letsgowiththechildren.co.uk/places-to-go/beachy-head/>

[https://mikon-online.com/mikon\\_en/mineralien-einzelhandel/e-h/h/halite-x-volkenroda-thueringen-d-ks.html](https://mikon-online.com/mikon_en/mineralien-einzelhandel/e-h/h/halite-x-volkenroda-thueringen-d-ks.html)

# Karst Rocks

➤ Salt/Halit/Tuz

Evaporite rocks



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