Introduction to Physical Hydrology

- Online Course (April-June 2020)
- Textbook: http://ukcatalogue.oup.com/product/9780199296842.do
- Online Resource Centre: <u>www.oxfordtextbooks.co.uk/orc/hendriks/</u>

GEO2-4203 Physical Hydrology (Utrecht University) students:

- Blackboard: <u>www.uu.nl/blackboard</u>
- Course guide: see Blackboard



Introduction



Paperback | 351 pages Follow the book's didactic concept!

- Hydrological cycle
- Drainage basin
- Water balance
- Energy equation
- Flow equation
- Continuity equation
- **1. Introduction**
- 2. Atmospheric water
- 3. Groundwater
- 4. Soil water
- 5. Surface water

Exercises

Introduction

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	Introduction to Physical Hydrology 物理水文学导论
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China Meteorological Press Follow the book's didactic concept!

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Exercises

Hydrological cycle



After Ward and Robinson (2000)

Interception



Water table





Drainage basin / Catchment



Area shown: 2.66 km² Altitude range: 268–421 m View is from the NW 29 (WE) × (NS) point altitude matrix Vertical exaggeration: 4×



Catchment boundaries



Drainage basin processes



Water balance



Area shown: 2.66 km² Altitude range: 268–421 m View is from the NW 29 (WE) \times (NS) point altitude matrix Vertical exaggeration: 4 \times *Inflow = Outflow + Change in Storage*

$$In = Out + \frac{\Delta S}{\Delta t}$$
$$\frac{\Delta S}{\Delta t} > 0, \text{ or } \frac{\Delta S}{\Delta t} < 0, \text{ or } \frac{\Delta S}{\Delta t} = 0$$

$$P = Q + E_{\rm a} + \frac{\Delta S}{\Delta t}$$

- Strictly defined area or drainage basin
- Strictly defined period of time
- Fixed units of measurement

De Wereld Draait Door



Take a look at this short film (Blackboard Ch. 2)! Your major comment?

Coriolis at the equator



Study both Coriolis effect experiments (Blackboard Ch. 2)! Your observations and comments? Your major conclusion?





Hendriks, M.R. (2010). Introduction to Physical Hydrology. Oxford University Press.

Ward, R.C. and Robinson, M. (2000). Principles of Hydrology. 4th Edition. McGraw-Hill, 450 pp.