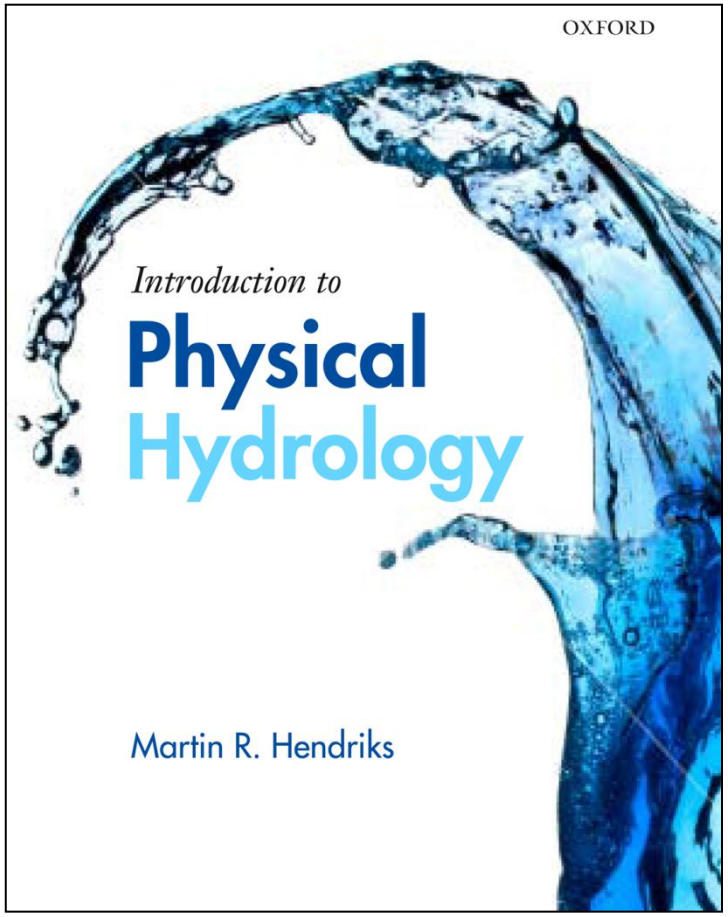
# Atmospheric water




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

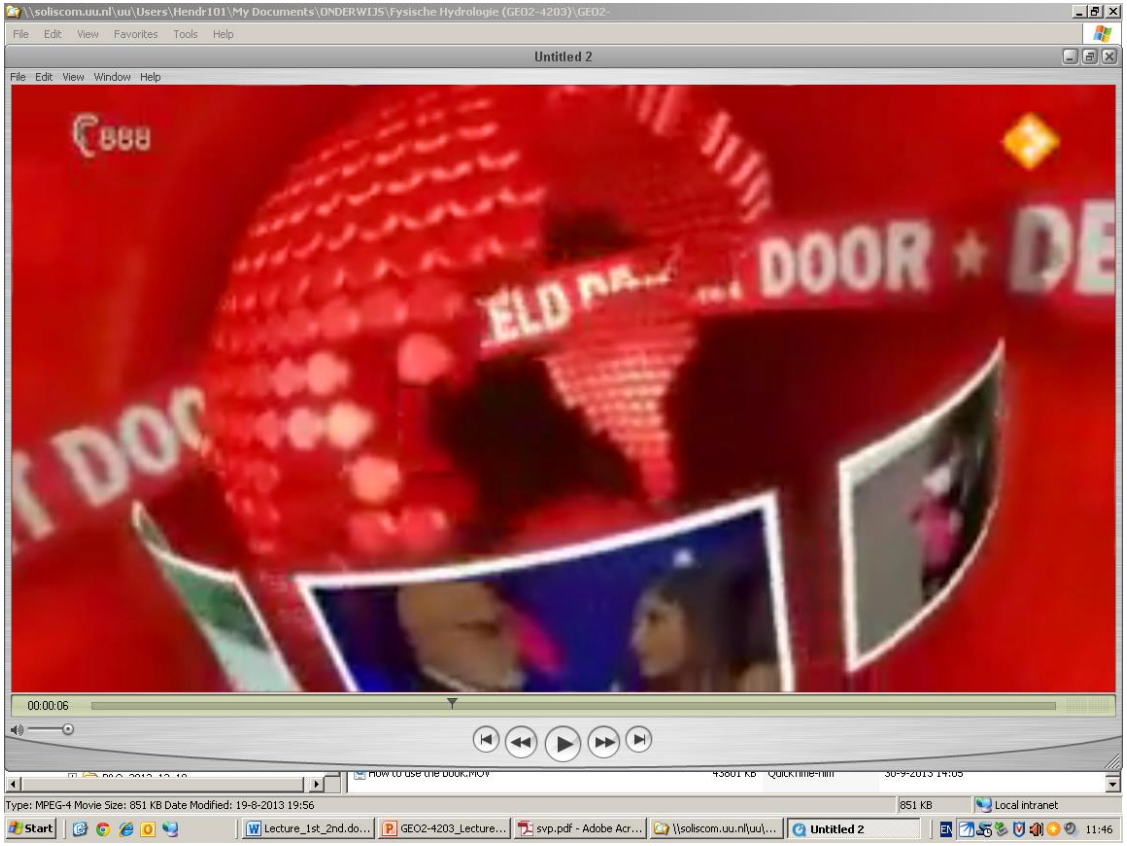
- Hydrological cycle
- Drainage basin
- Water balance

- Energy equation
- Flow equation
- Continuity equation

1. Introduction
2. **Atmospheric water**
3. Groundwater
4. Soil water
5. Surface water

Exercises

# De Wereld Draait Door

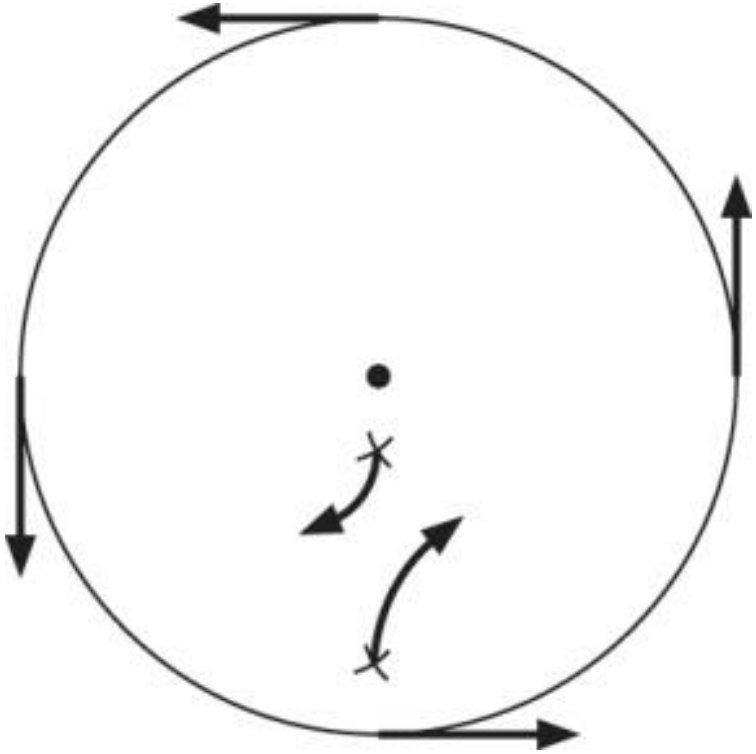


# Coriolis at the equator

# Multiple choice question

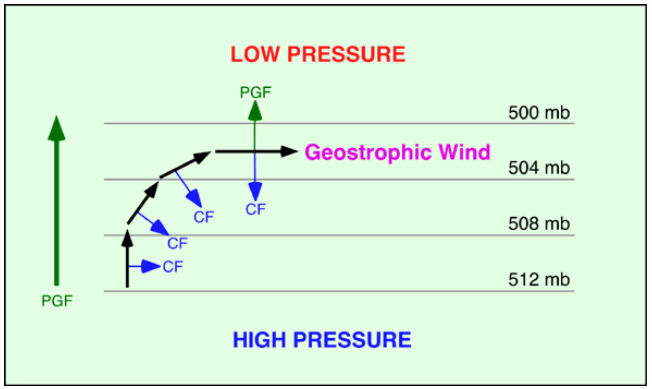
A. Both videos tell the truth.
B. Only video 1 tells the truth.
C. Only video 2 tells the truth.
D. Neither video tells the truth.

# Coriolis effect - Northern Hemisphere (N.H.)



# Geostrophic wind – Jet streams

no friction $\Longrightarrow$ geostrophic wind



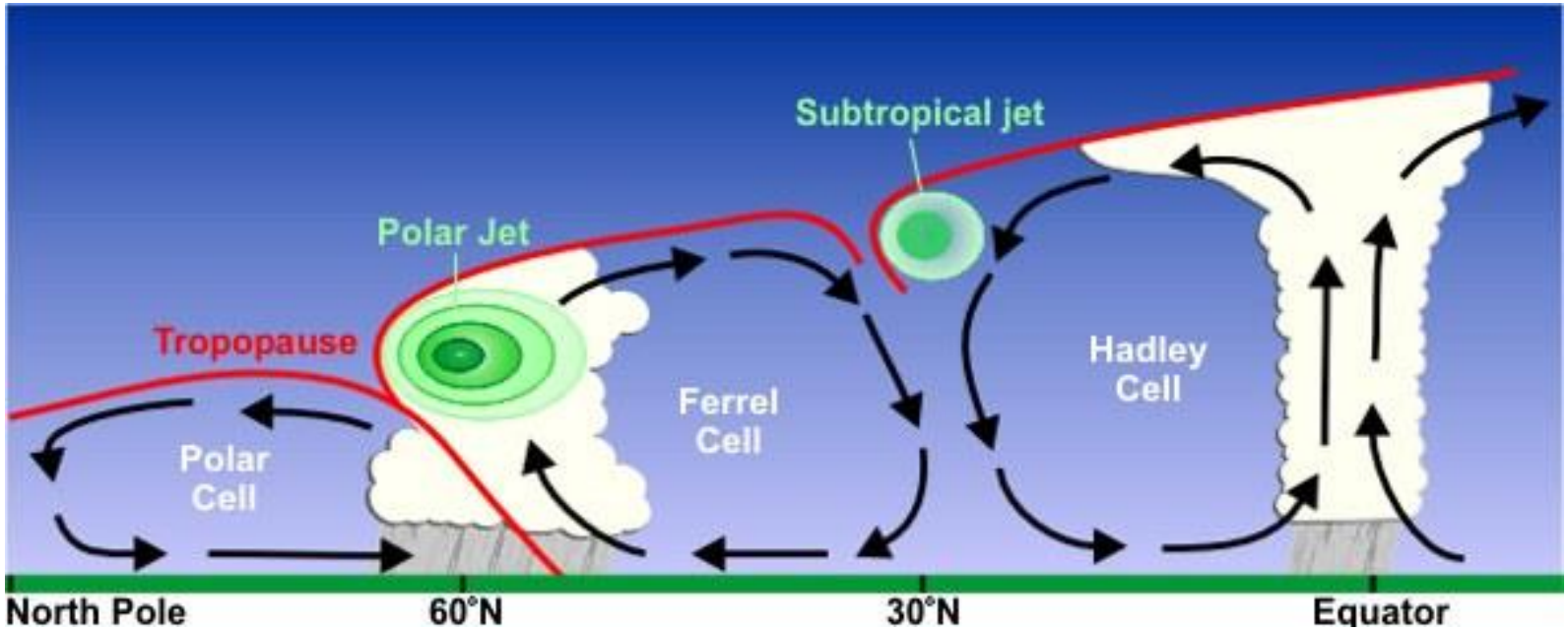
Source: https://www.assignmentpoint.com/science/physics/geostrophic-wind.html

Source: Wikipedia

Jet streams: at an altitude of 9-10 km
6 km wide, meandering over a width of 200-800 km

Usually there are two in the N.H., and two in the S.H.

# Atmospheric circulation - N.H.




Source: Wikipedia

# Atmospheric circulation

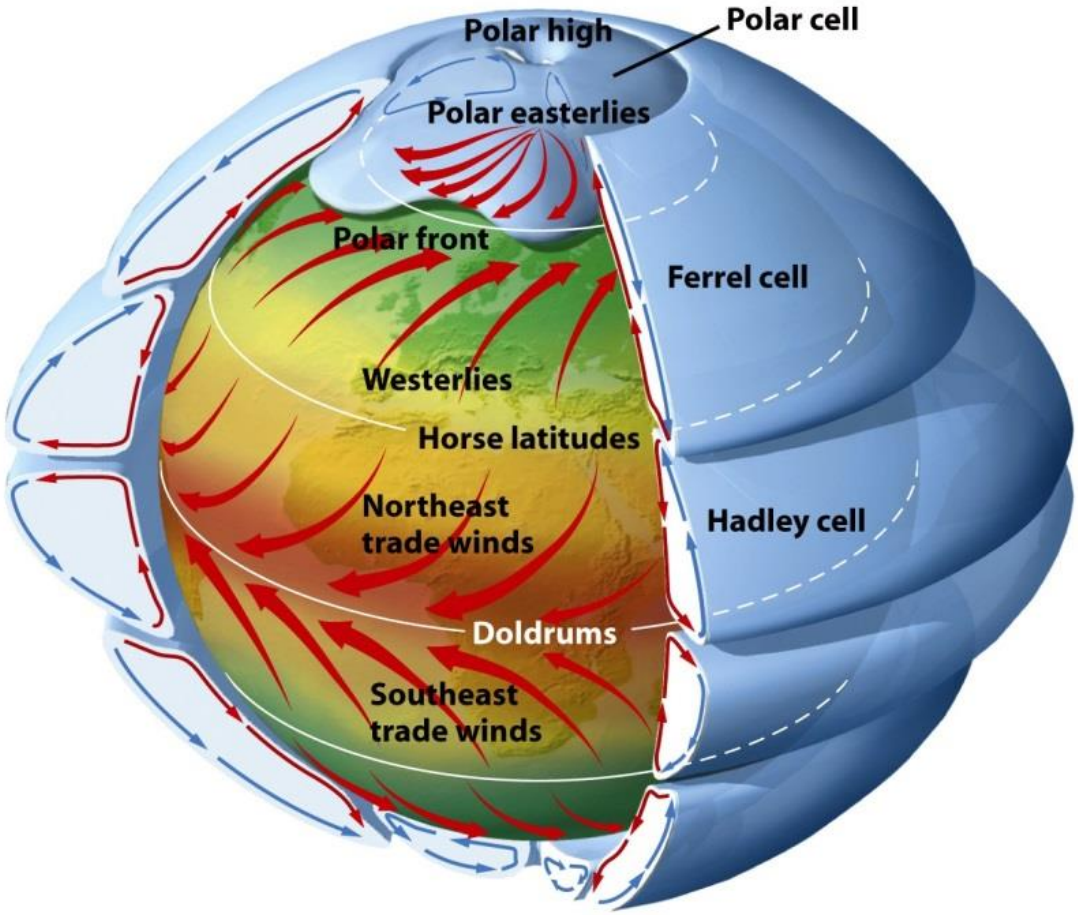
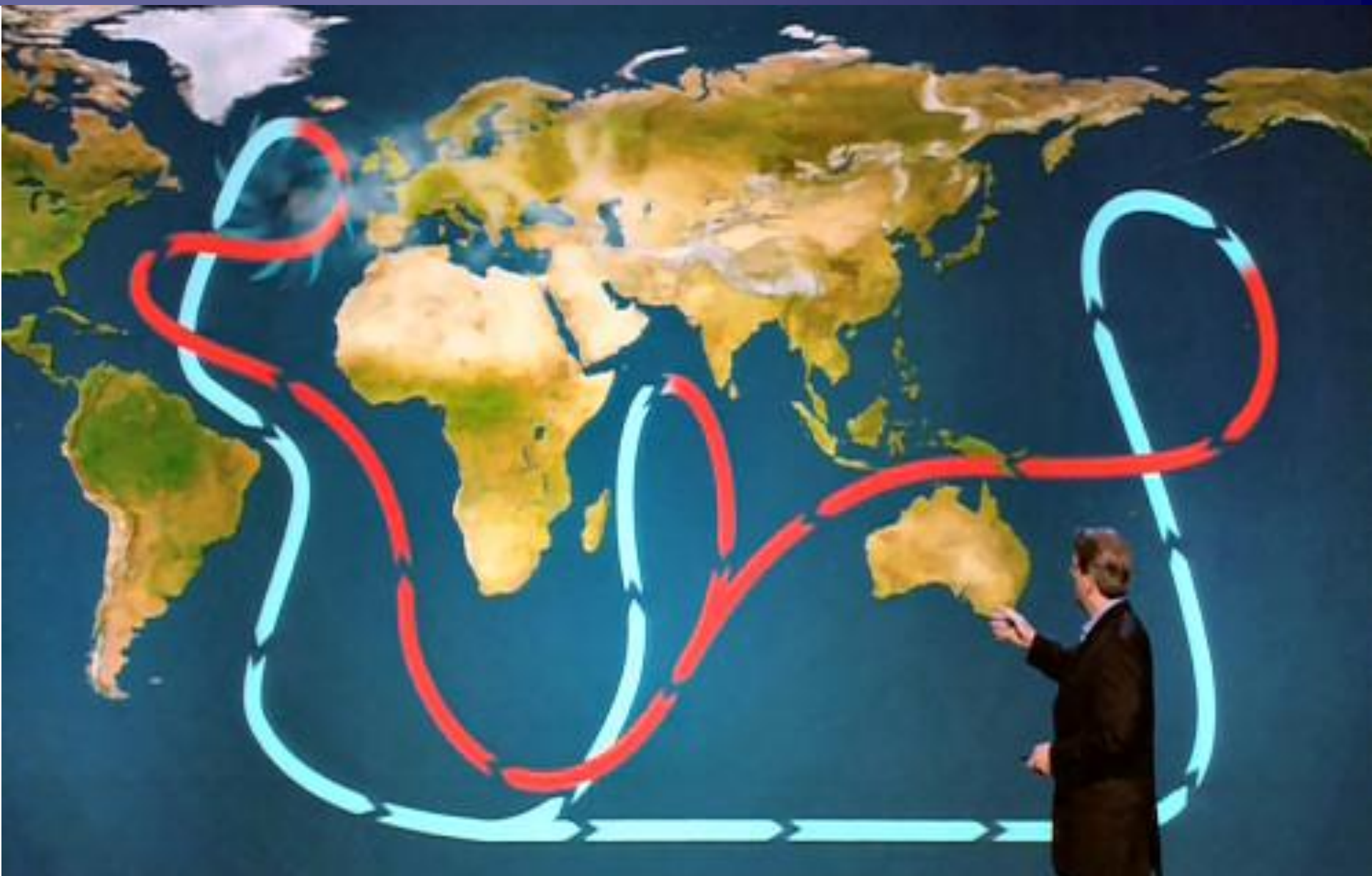



Figure 20-11c Earth: Portrait of a Planet 3/e
© 2008 W. W. Norton & Company, Inc.

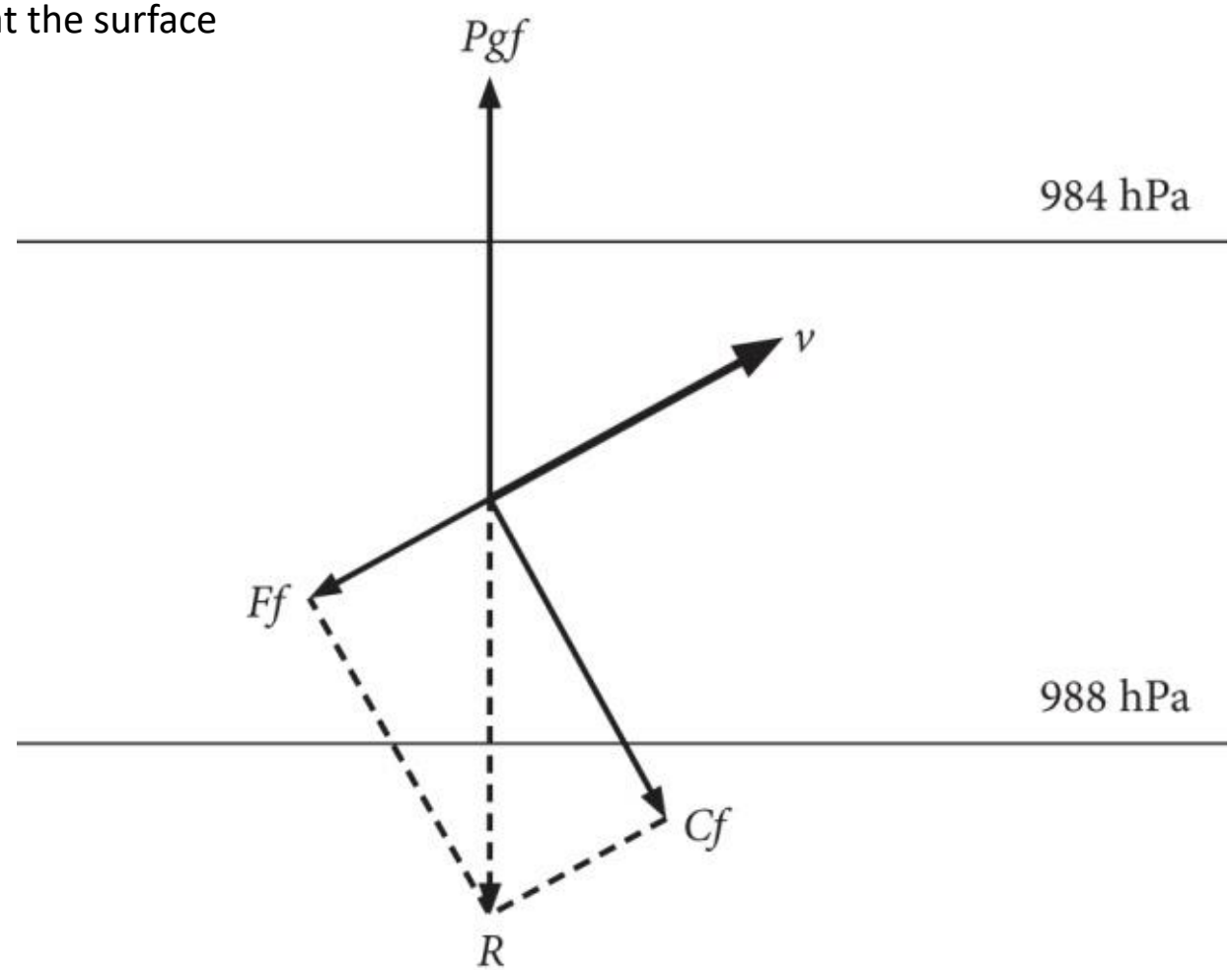
# Ocean conveyor belt circulation

Source: https://climatesanity.wordpress.com/2009/06/04/the-thermohaline-circulation-only-stops-for-extreme-unrealistic-models/

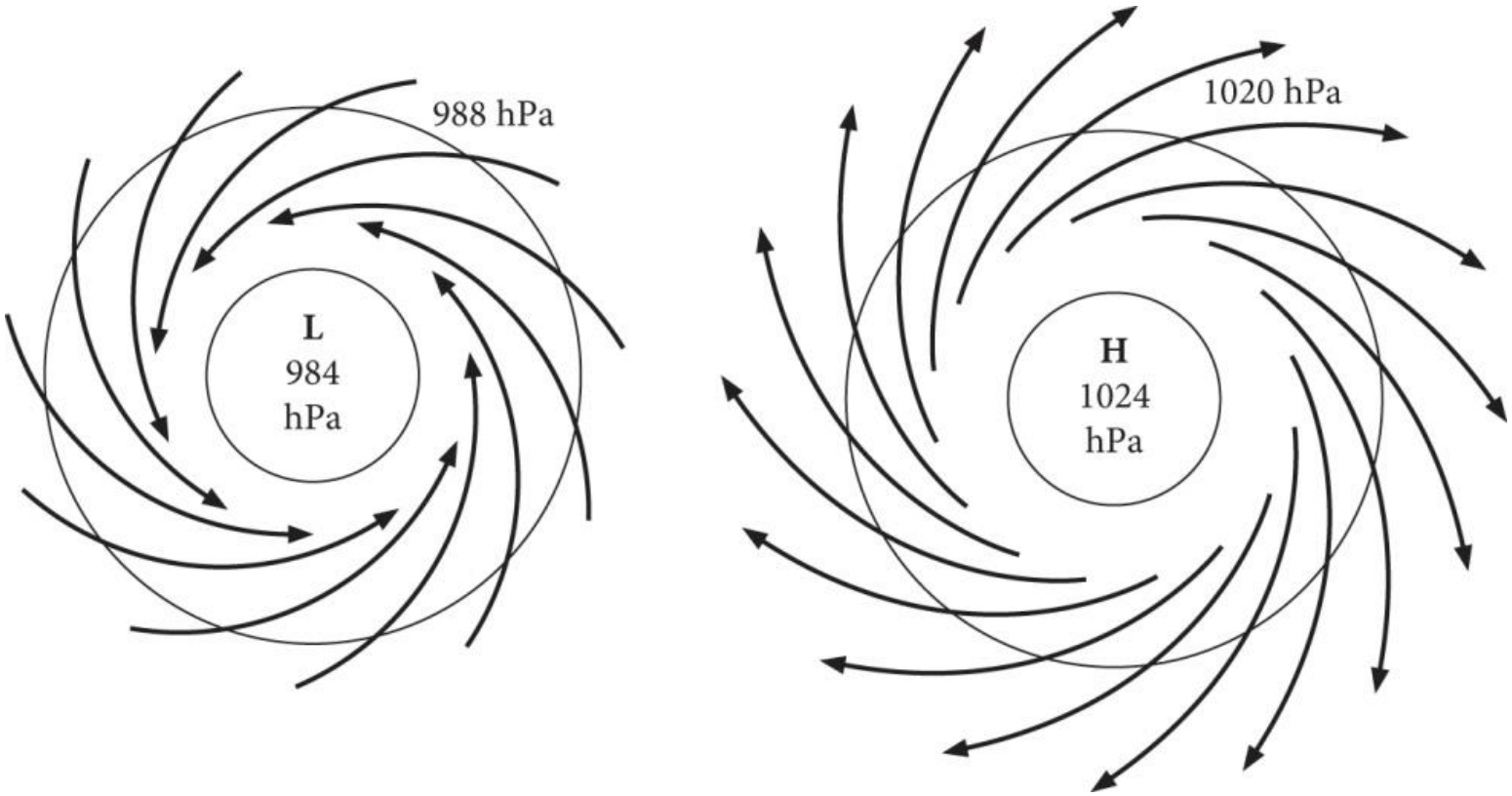


# Buys Ballot's law - N.H.

Friction $Ff$ at the surface

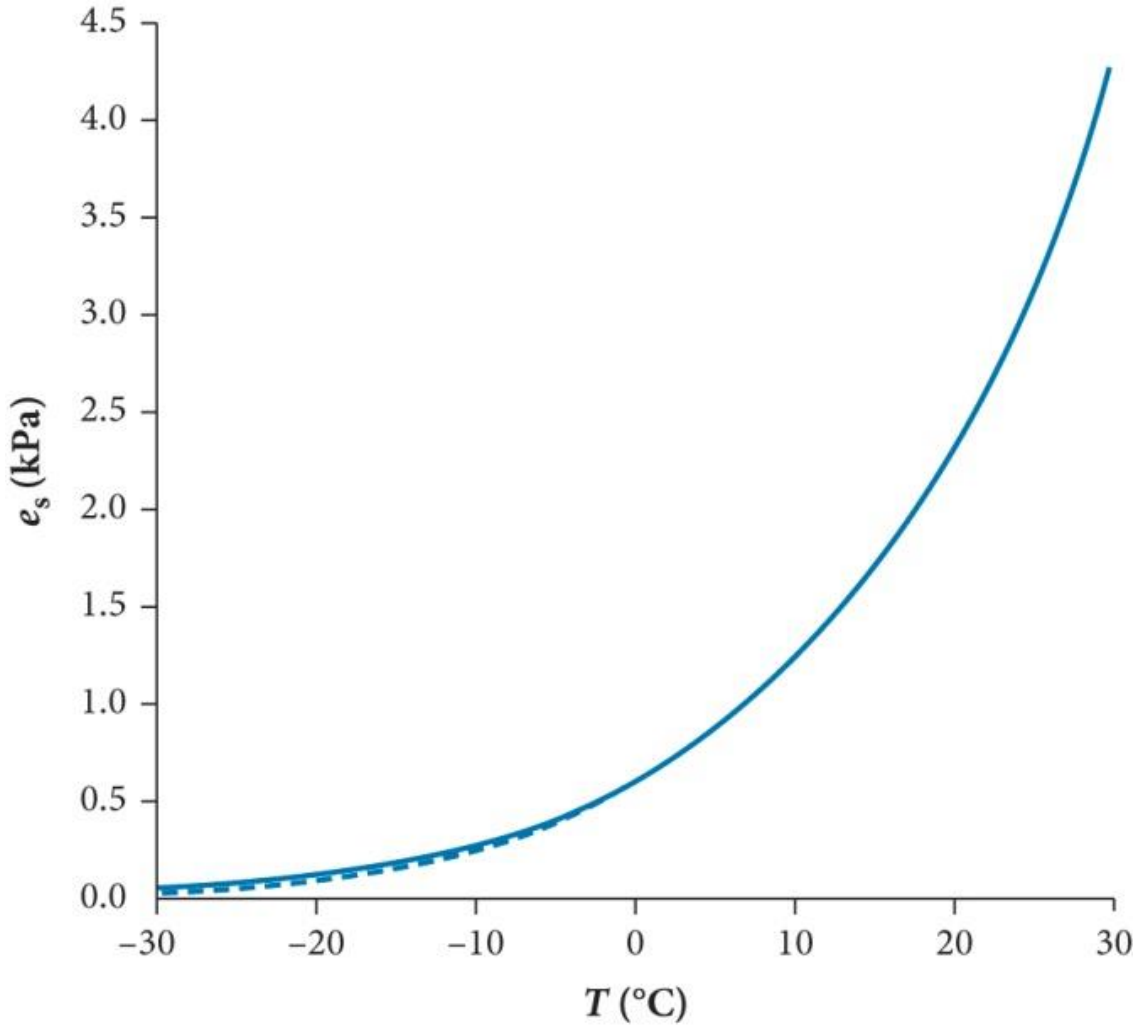


# Air movement - N.H.




After Schmidt (1976)

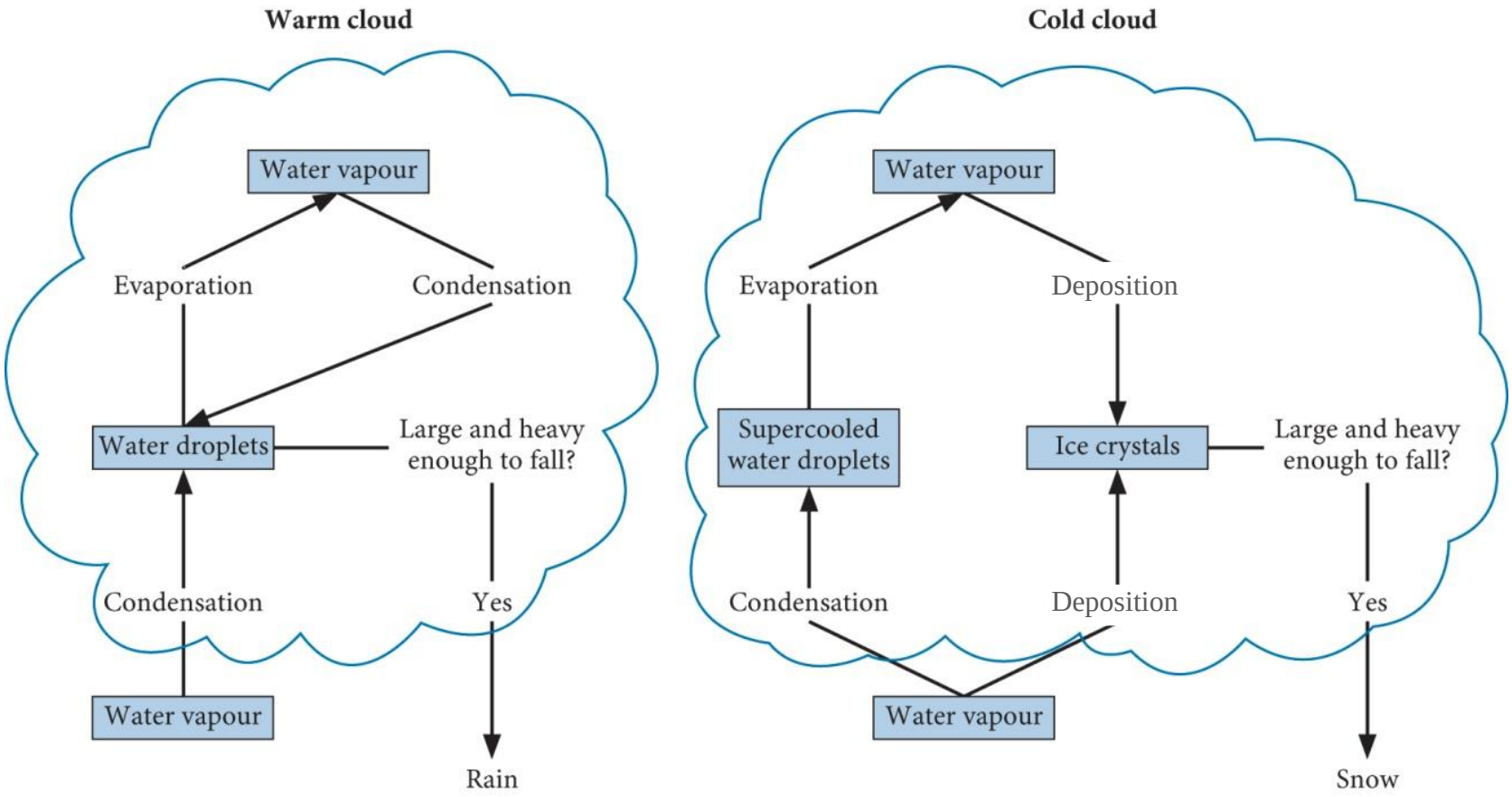
# Clausius-Clapeyron relation



# Cloud formation

# Ground fog

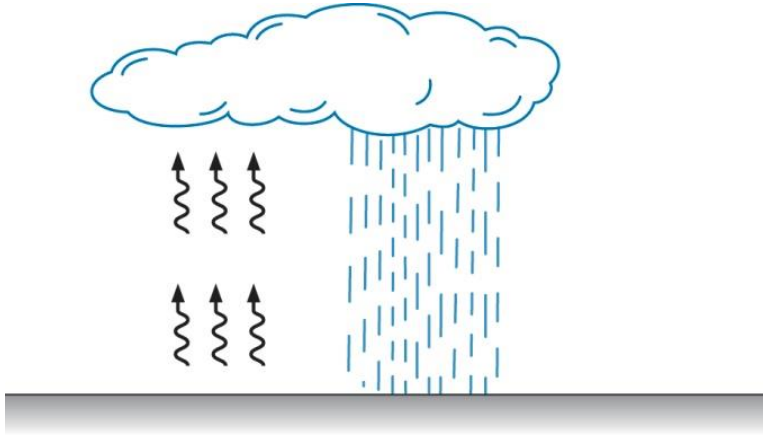
# Generation of precipitation

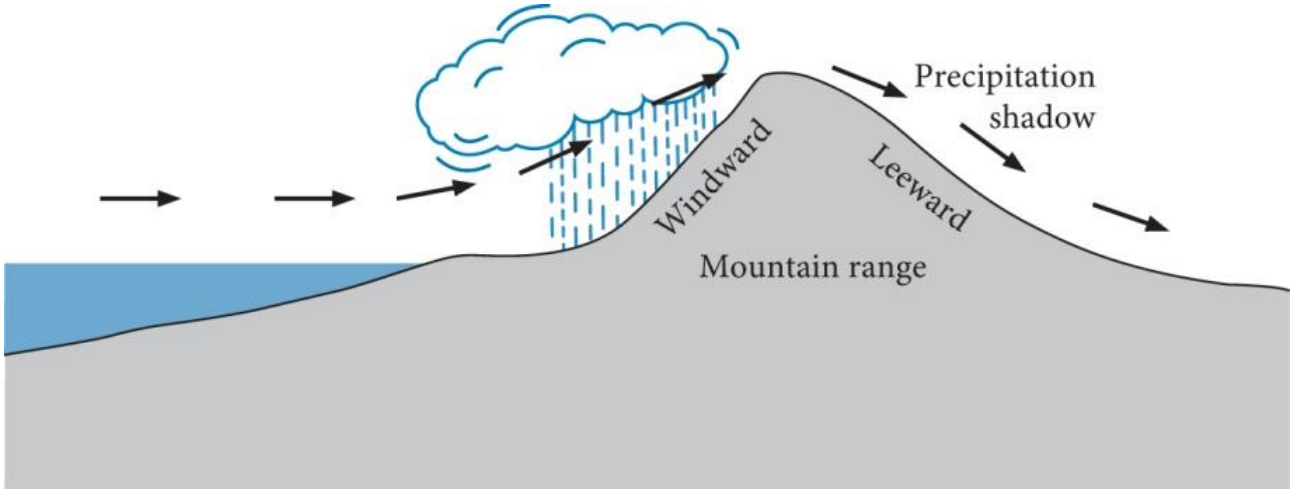



Ice-forming nuclei: salt crystals; particles from forest fires, dust storms, volcanic eruptions; micro-meteorites

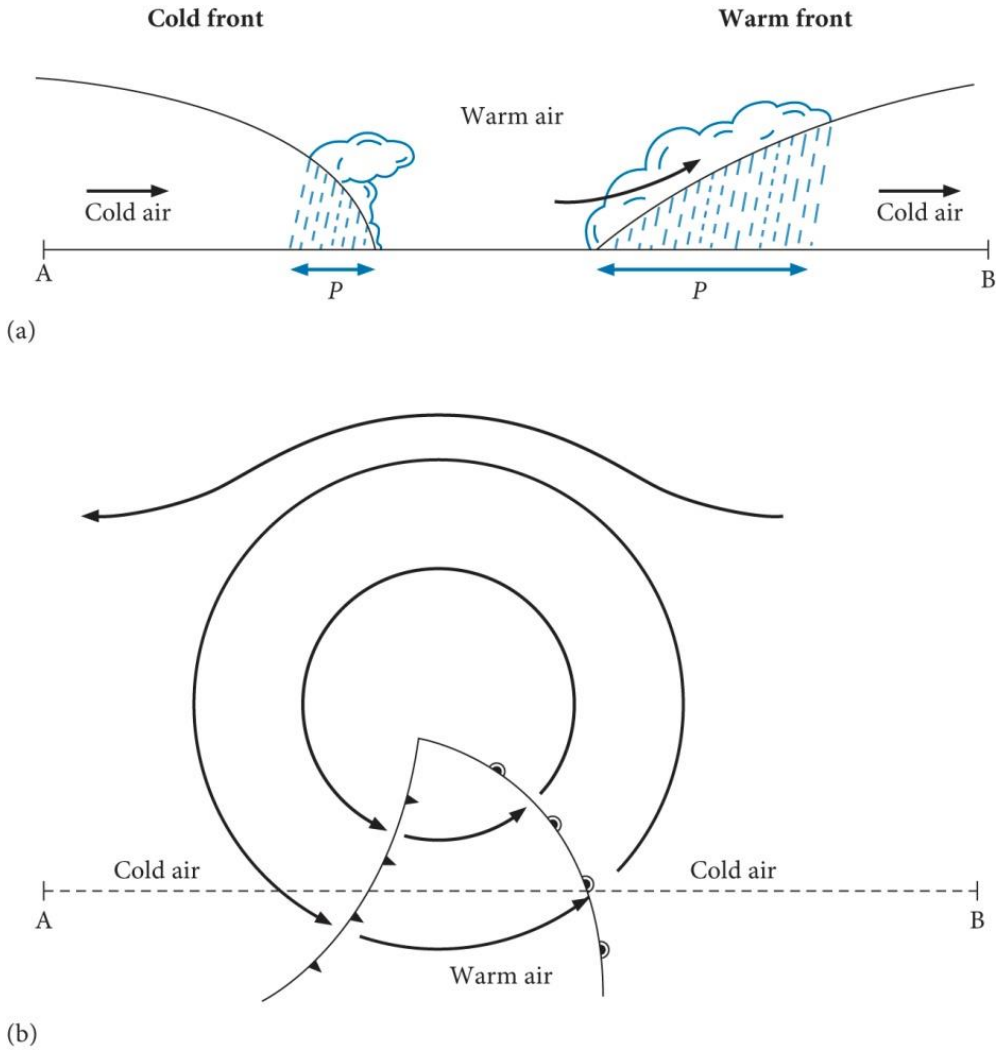
**Pseudomonas syringae!**

# Generation of precipitation





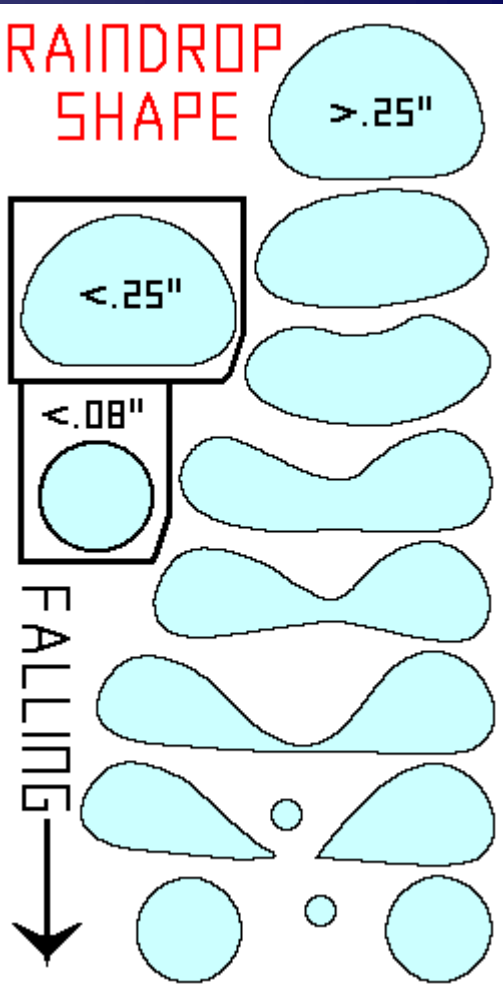
# Generation of precipitation




After Ward and Robinson (2000)

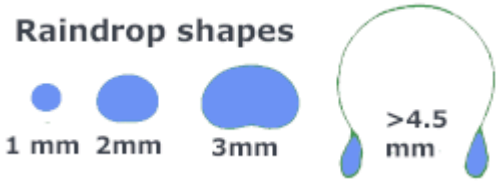
# Falling raindrop

Source: https://legacy.theskepticsguide.org/raindrops-achieve-super-terminal-velocity




Raindrops are not shaped like teardrops

Source: https://pmm.nasa.gov/education/articles/shape-of-a-raindrop



# References

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Schmidt, F.H. (1976). Inleiding tot de meteorologie [Introduction to Meteorology]. Aula-boeken 112. Het Spectrum.

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