

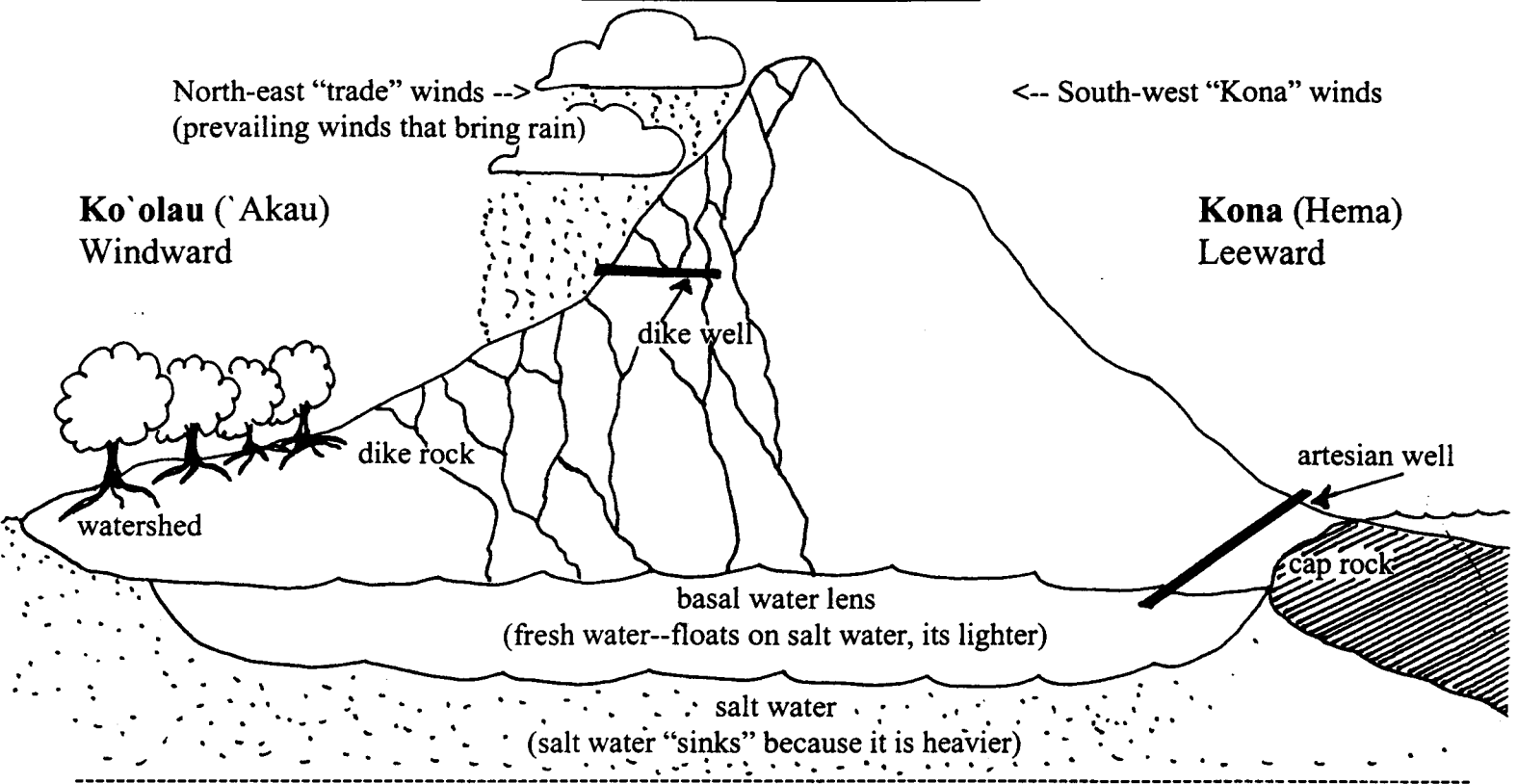
O'ahu's Water Resources

North-east "trade" winds -->
(prevailing winds that bring rain)

<-- South-west "Kona" winds

Ko'olau (Akau)
Windward

Kona (Hema)
Leeward



In Hawai'i, the tradewinds bring moisture to the islands, which usually condense over land, which is warmer than the open ocean. The clouds usually collect on the Ko'olau or windward side of the island, and are trapped by the high mountain peaks. Thus when condensation occurs, most of the rain falls on the Ko'olau side of the island. This type of rain is called **orographic rainfall**. Orographic rain is particular to high volcanic island, as the warm, moist air is pushed up by high mountains. This creates heavy cloud cover, and eventually rain. This creates a continuous cycle of rain, which is why it usually rains on a daily basis in Hawai'i, particularly in the mountains.

When it rains, some rain is absorbed into the land and trapped in the **dike rock**. This volcanic rock is porous, and collects water in a manner similar to a sponge, as water becomes trapped in chambers in the porous rock. This water is collected today through horizontal tunnels called **dike wells** which have been drilled into the dike rock, releasing the trapped water. The rest runs off if the land is already saturated, or if it can't absorb the rain at a quick enough rate. This run-off creates waterfalls, streams and rivers. Some of it is later absorbed in the **watershed**, forested areas of land which collects and traps water.

The trapped water eventually filters through the dike rock and collects in a **basal lens**. This is fresh water which "floats" on the denser salt water trapped beneath the **cap rock**, a thick layer of non-porous rock which makes up the foundation of the island.

On the Kona side of the island, **artesian wells** with pumps suck out fresh water from the basal lens. This method is considered inferior to the dike well process, as overpumping can draw salt water into the system, making the pumped water brackish and unsuitable for drinking.

vocabulary and terms:

artesian well
basal lens
cap rock
dike rock
dike well
Kona

Ko'olau
orographic rainfall
prevailing winds
tradewinds
watershed