Danakil Restoration - Global Climate Management

Restoration of the Danakil is a low cost template of Seawater Solutions





PERCIPITATION, DEPOSITION / DESUBLIMATION Water droplets fall from clouds ______ as drizzle, rain, snow, or ice.

ADVECTION

Winds move clouds through the atmosphere.

CONDENSATION, CLOUDS, FOG

Water vapor rises and condenses as clouds.

EVAPORATION

Heat from the sun causes water to evaporate.

HYDROSPHERE, OCEANS

The oceans contain 97% of Earth's water.

The Water Cycle

Water moves around our planet by the processes shown here. The water cycle shapes landscapes, transports minerals, and is essential to most life and ecosystems on the planet. ACCUMULATION, SNOWMELT, MELTWATER, SUBLIMATION, DESUBLIMATION/DEPOSITION

Snow and ice accumulate, later melting back into liquid water, or turning into vapor.

SURFACE RUNOFF, CHANNEL RUNOFF, RESERVOIRS

Water flows above ground as runoff, forming streams, rivers, swamps, ponds, and lakes.

PLANT UPTAKE, INTERCEPTION, TRANSPIRATION

Plants take up water from the ground, and later transpire it back into the air.

INFILTRATION, PERCOLATION, SUBSURFACE FLOW, AQUIFER, WATER TABLE, SEEPAGE, SPRING, WELL

Water is soaked into the ground, flows below it, and seeps back out enriched in minerals.

VOLCANIC STEAM, GEYSERS, SUBDUCTION Water penetrates the earth's crust, and comes back out as geysers or volcanic steam

Water Cycle v1.11 (2016) was created by Chud Tal. Contact info at ebudtal.com

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Climate Change Solutions

Yes, people have written books and papers on the subject of <u>Tracing the Sources of the Nile Water</u>. The image on the left is from the article at the link above.

It is important to understand that the yellow arrow represents hot and dry air that flows off of the Arabian Peninsula, over the top of the marine boundary layer above the Red Sea and provides the majority of the air mass within the Danakil depression. From here this hot and dry air flows onto the Ethiopian Plateau and into the heart of the African continent.

The Freshwater-Food-Energy-Carbon-Nexus



Energy and Carbon **Emissions**

Continental Monsoon Cycles





One definition of the word Monsoon is "a seasonal change in wind direction".

Most of the moisture for the African monsoon comes from the Atlantic Ocean.

Most of the moisture created by evaporation from the surface of the Red Sea flows out of the Red Sea to the South.

This currently provide little benefit to the surrounding desert regions.

Continental Hydrology Patterns







Local Topography

Regional topography shows the dynamics and opportunities for direction perspiration uptake in the immediate proximity. Mountains will allow the water to fall and flow into local hydrological cycles.



Local Soils Compositions

The geology of the region indicates that "sediments" compose most of the material we would need to move in order to create a "Pilot" flood channel for the Danakil Basin.

Once a significant flow in started, erosion will complete the job for us.

Mabla rhyolites Series 10 - 14 Ma Peralkaline granites 22 - 26 Ma

Pre-rift group

Neoprotorozoic Basement Mesozoic sediment **Eocene-Miocene basalt**

Anfile Bay-Red Sea

Sea Level

9,937 Square Kilometers

Pilot channel to get the water flowing

Channel Length (m)	28,462
Average width of cut (m)	30
Average Depth of cut (m)	20
Volume of Cut (m ³)	17,077,200
Cost per Cubic Meter	\$15

Cost of Channel \$256,158,000



Regional Hydrology Mapping

The surrounding tributaries will see a variety of enhancements to water flow but also to positive feed loopback cycles associated with additional precipitation.

The development will also make projects like the great green wall much easier as nature will do most of the plant expansion..



Local Tributaries Improved

All tributaries to the Atara river will see increased precipitation and river flows.

In Eritrea, the Barkai and Anseha rivers should see a similar result.

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Thank you!

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