

## Most essential factor of the habitable Earth: initial ocean volume 3-5km thick

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Considering the size of ecosystem on the Earth, one at deep-sea hydrothermal system and another on the surface, and history of life in relation to the emergence of the second system after 800-600Ma, it is concluded that the fate of life system on the Earth was determined to be initial ocean mass that was extremely tight constraint as 3-5 km thick. The planet Earth has lost water into mantle 4.0 b.y after the birth, because of cooling. Appearance of huge landmass above sea-level caused the global dispersion of nutrients by rivers and winds, driven by Sun which drives the material circulation of the system. If the value is 1km more than this limit, the metazoans have not yet appeared on the Earth. If the initial mass was smaller than 2.5km, plate tectonics did not operate to increase nutrients-enriched TTG crust on the Earth. No evolution of life is expected, even if it was born.