

Groundwater Cycle

V2. 8: Specific Storage and Storativity



2.8: Specific Storage and Storativity

The **specific storage** (S_s) is the amount of water per unit volume of a saturated formation that is stored or expelled from storage owing to compressibility of the mineral skeleton and the pore water per unit change in head.

$$S_s = \rho g(\alpha + \eta\beta)$$

Compressibility of the skeleton

Compressibility of the water



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The **specific storage** (S_s) has units of $[1/L]$ and must be multiplied by the thickness of the aquifer, b $[L]$, to obtain a value in % that can be compared to the specific yield.

The **storativity** (S) expresses the total amount of water released from the formation:

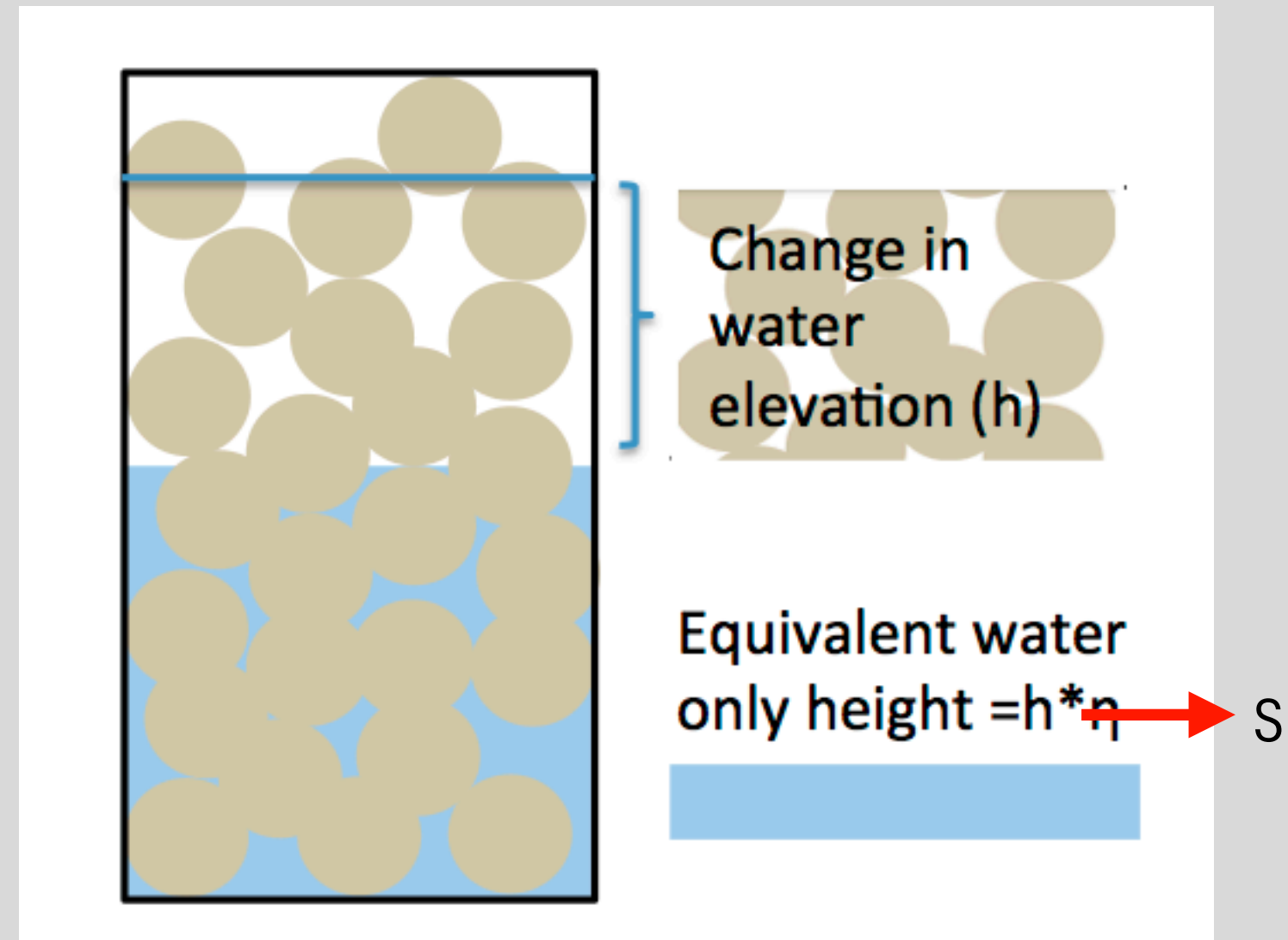
$$S = S_y + S_s * b$$

Confined Aquifers: $S < 0.5\%$

Unconfined Aquifers: $2\% < S < 30\%$



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Volume of water drained from an aquifer as head is lowered:

$$V_w = SA\Delta h$$



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An unconfined aquifer with a storativity of 0.13 has an area of 123 mi². The water table drops 5.23 ft during a drought. How much water was lost from storage?

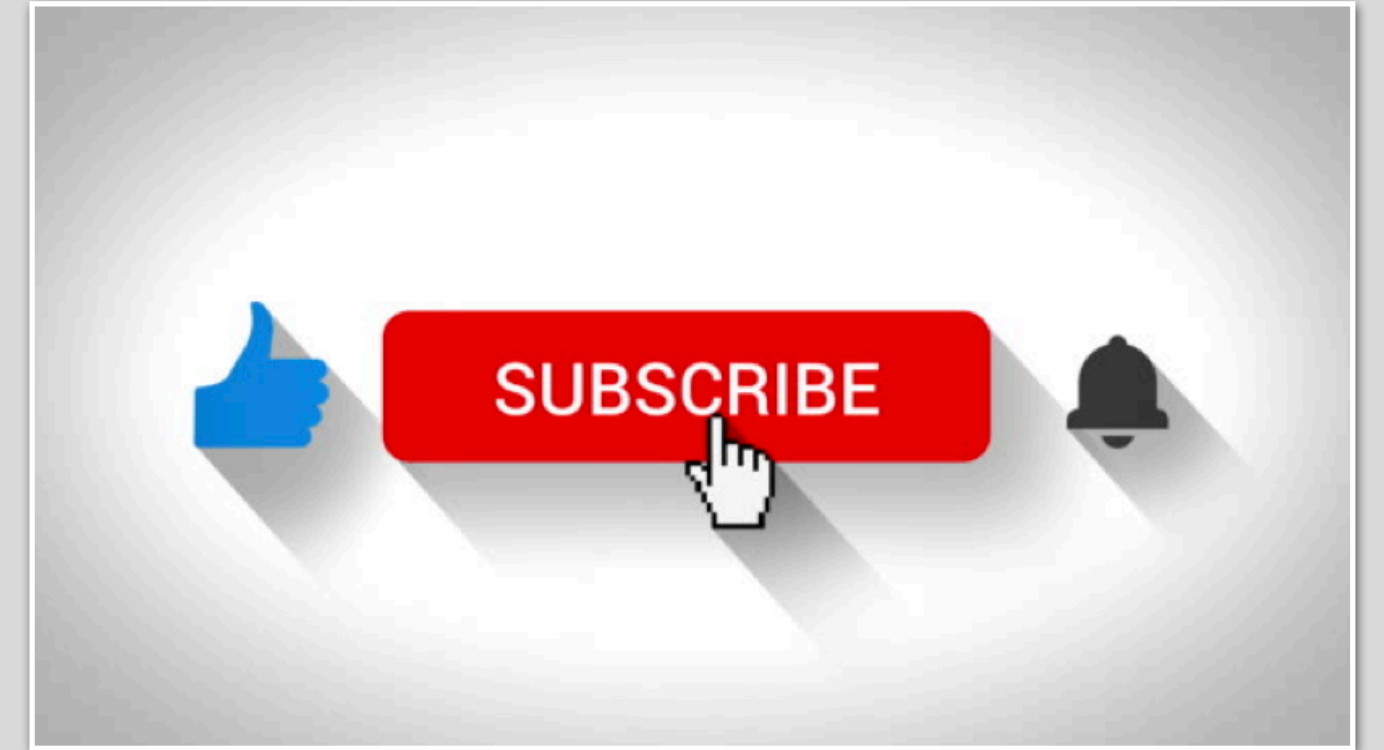
If the same aquifer had been confined with a storativity of 0.0005, what change in the amount of water in storage would have resulted?



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