



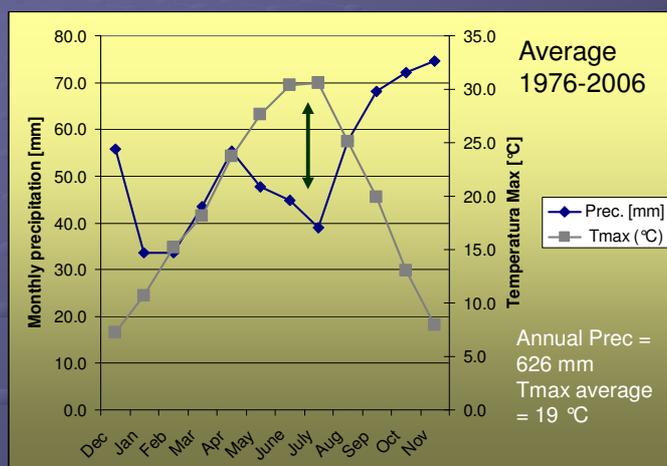


DISCONTINUOUS RECHARGE OF FRESH WATER LENSES ALONG THE ADRIATIC COAST, ITALY

Pauline Mollema and Marco Antonellini, University of Bologna (Italy)
Gualbert Oude Essink, Deltares (Netherlands)

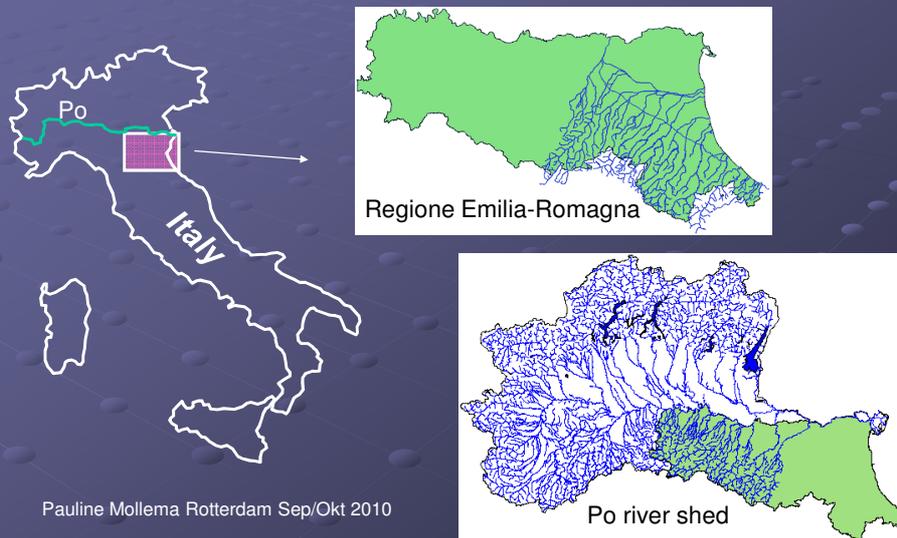


Climate change Adriatic coast Emilia-Romagna (Italy): wet and dry seasons more distinct.

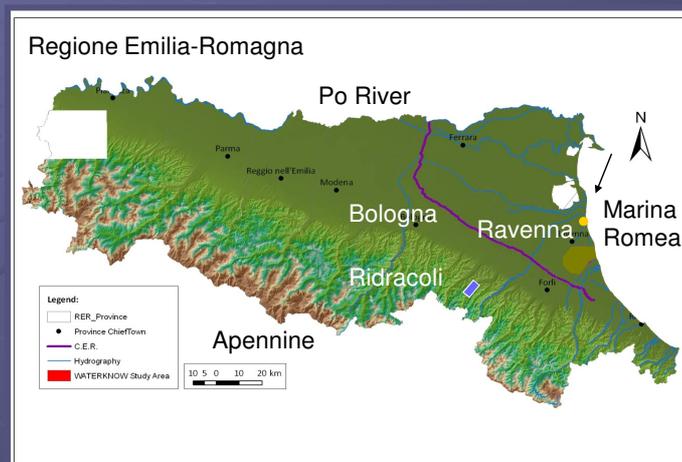


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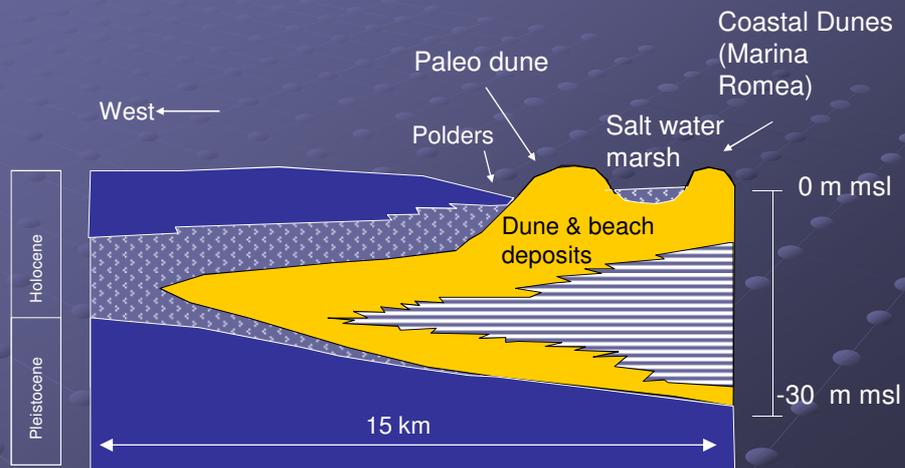
Study area, Ravenna, Italy: Apennine river basins.



Fresh water imported from Po river and Apennines



Subsidence, polders, old and new dunes

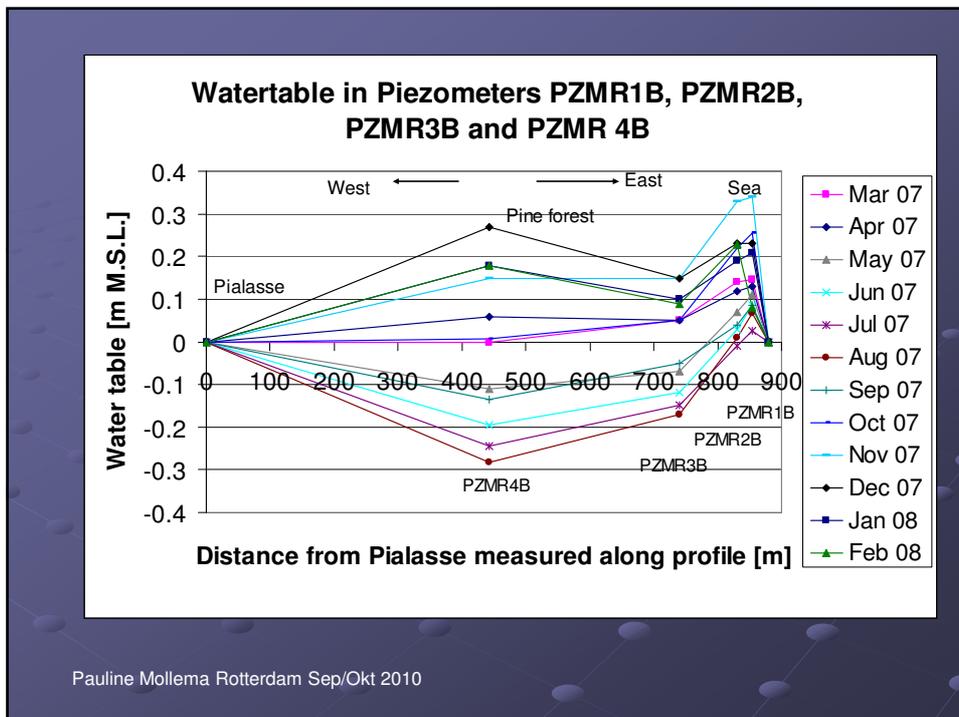


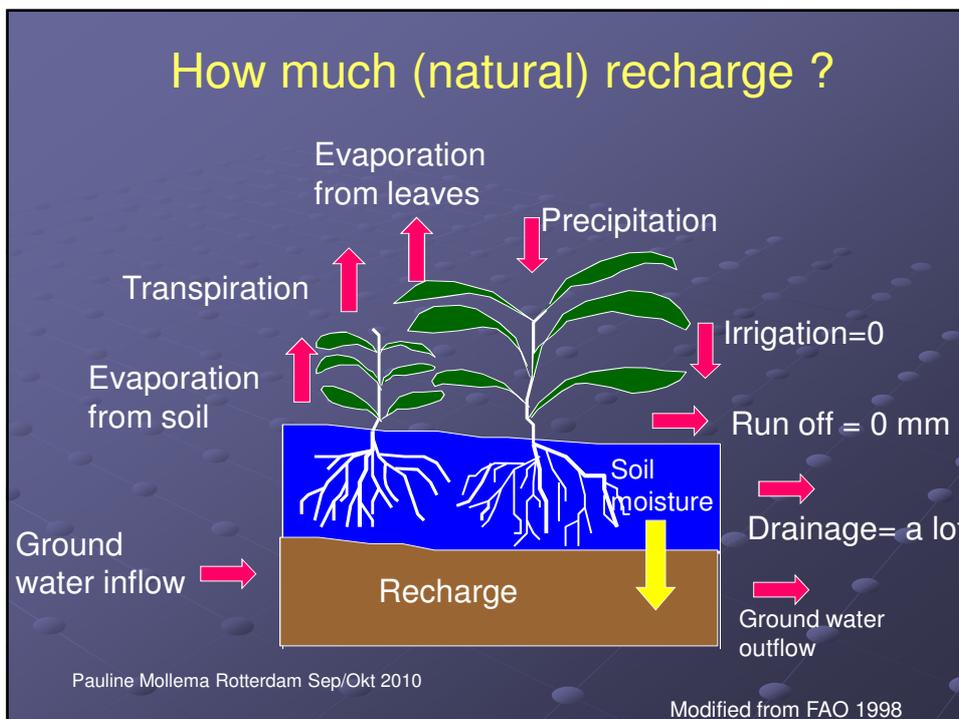
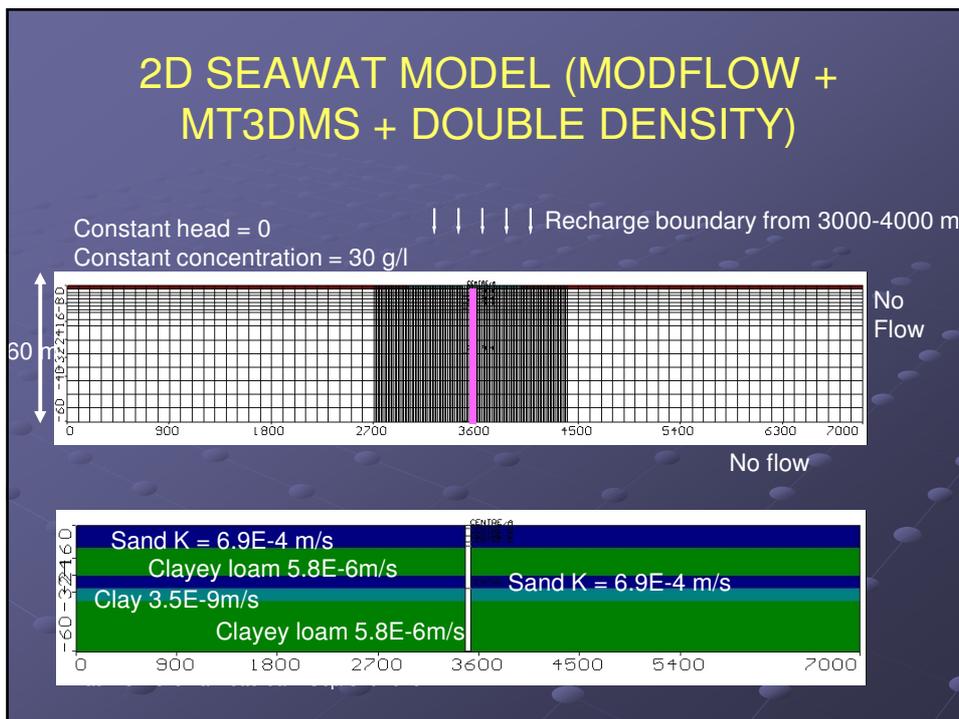
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Study Area Marina Romea, Province of Ravenna, Italy

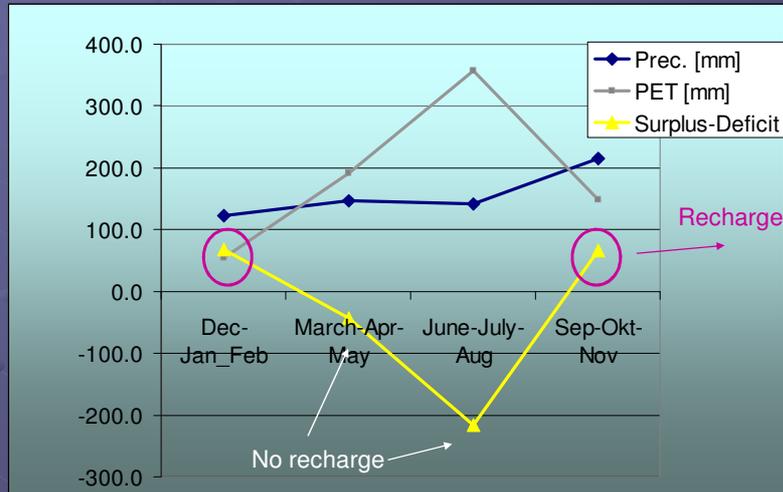


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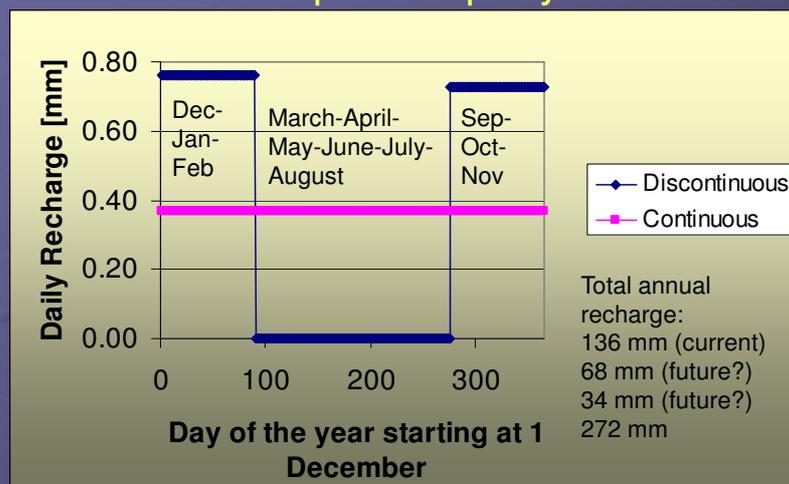


Recharge = Precipitation - Potential Evapotranspiration



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Daily recharge [mm] in models, applied in 4 stress periods per year.



Total annual recharge:
 136 mm (current)
 68 mm (future?)
 34 mm (future?)
 272 mm

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Development of fresh water lens

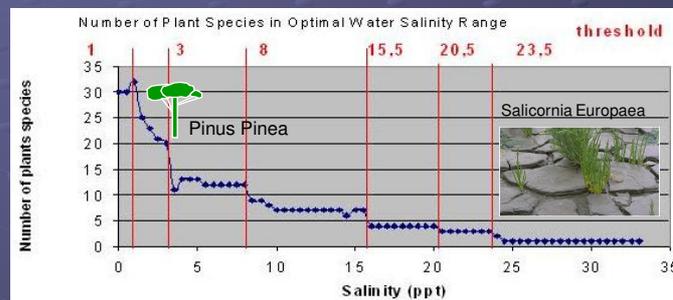
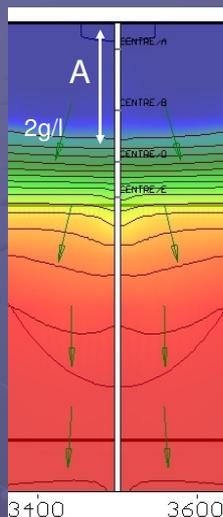


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P. Mollema

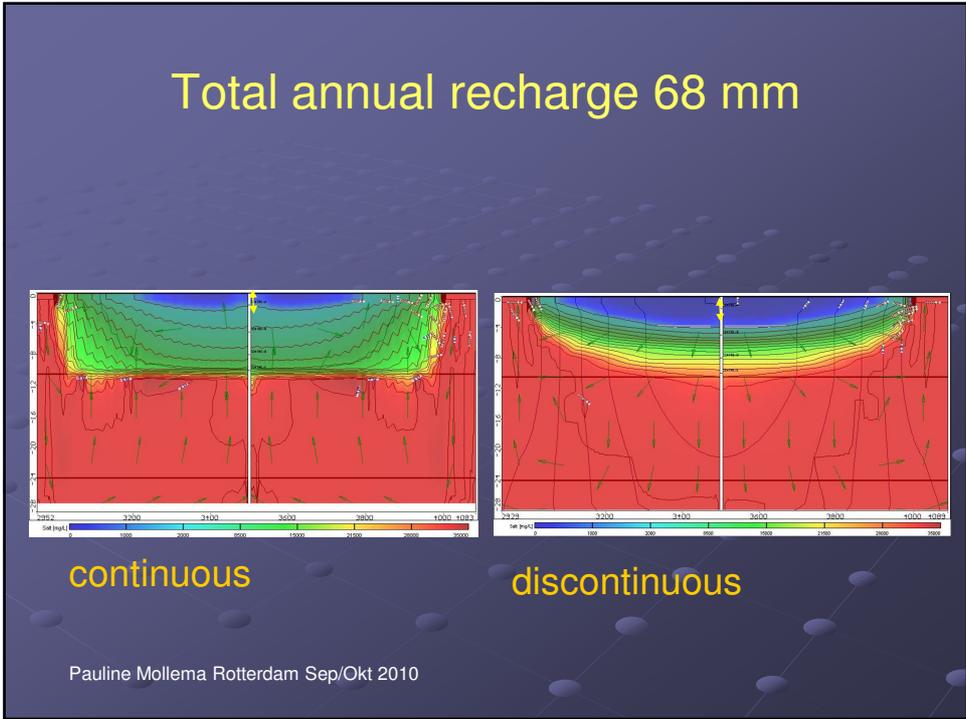
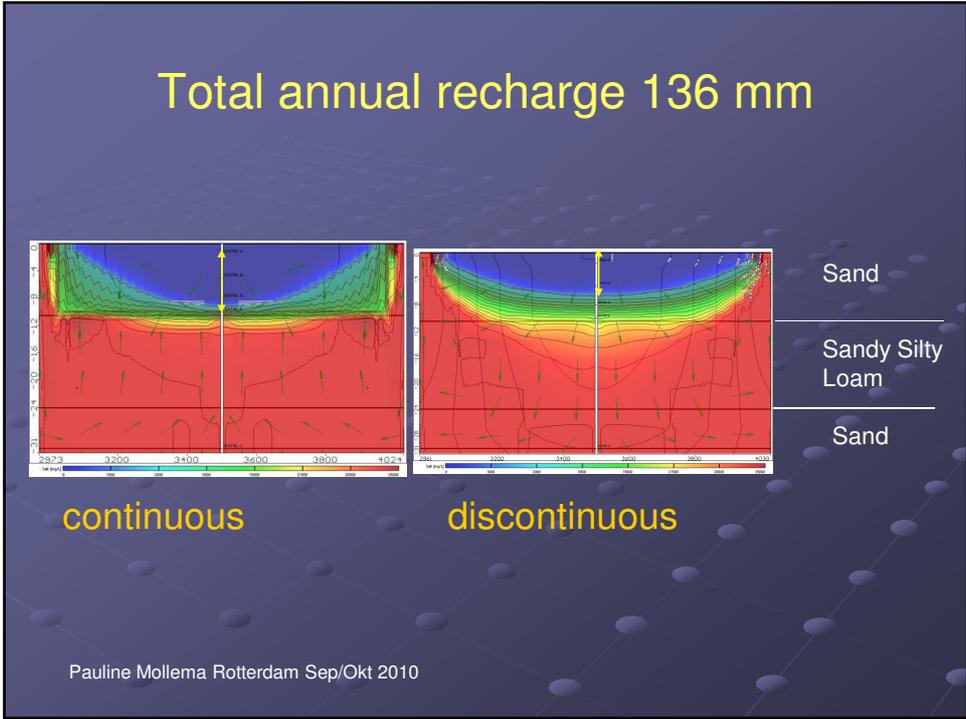
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Definition thickness fresh/brackish water water: depth to 2g/l contour-

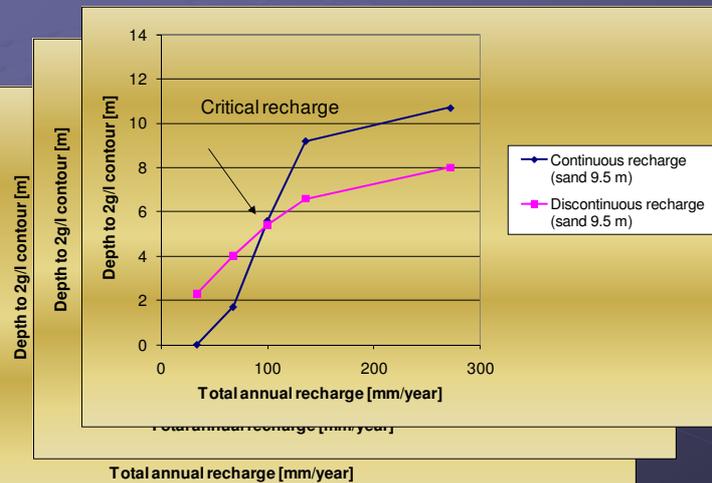


Antonellini and Mollema, 2010

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Fresh/brackish water depth vs annual recharge

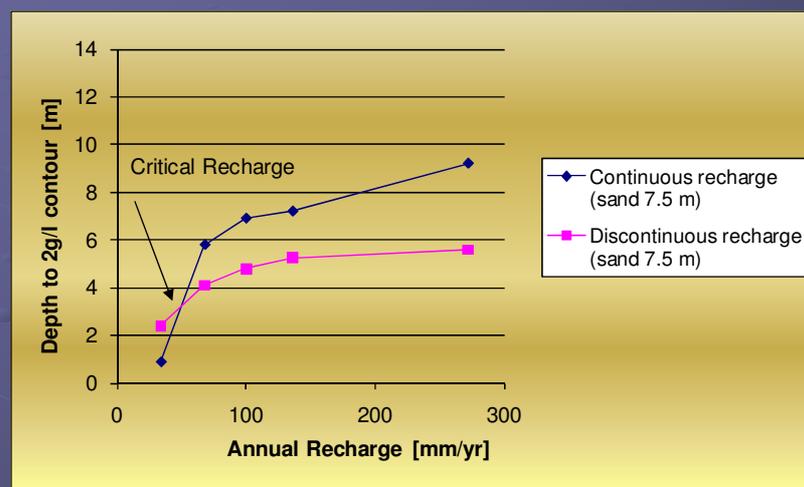


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Critical recharge sand layer of 7.5 m thick.



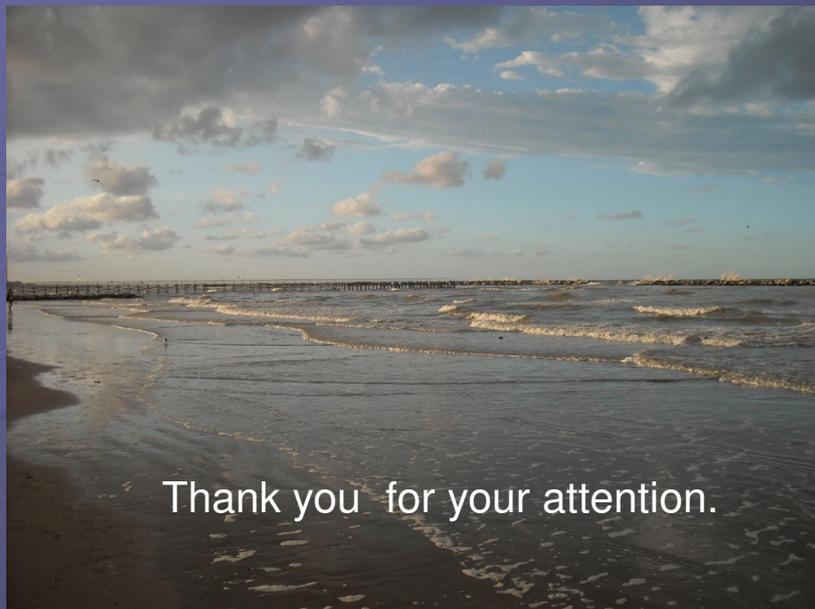
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Concluding remarks

- In areas with little and discontinuous recharge, fresh water lens may exist because of alternating periods of recharge and no recharge.
- Thickness of aquifer influences value of 'critical recharge'.
- Implications for Managed Aquifer Recharge
- Implications for Management of coastal Mediterranean aquifers

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P. Mollema