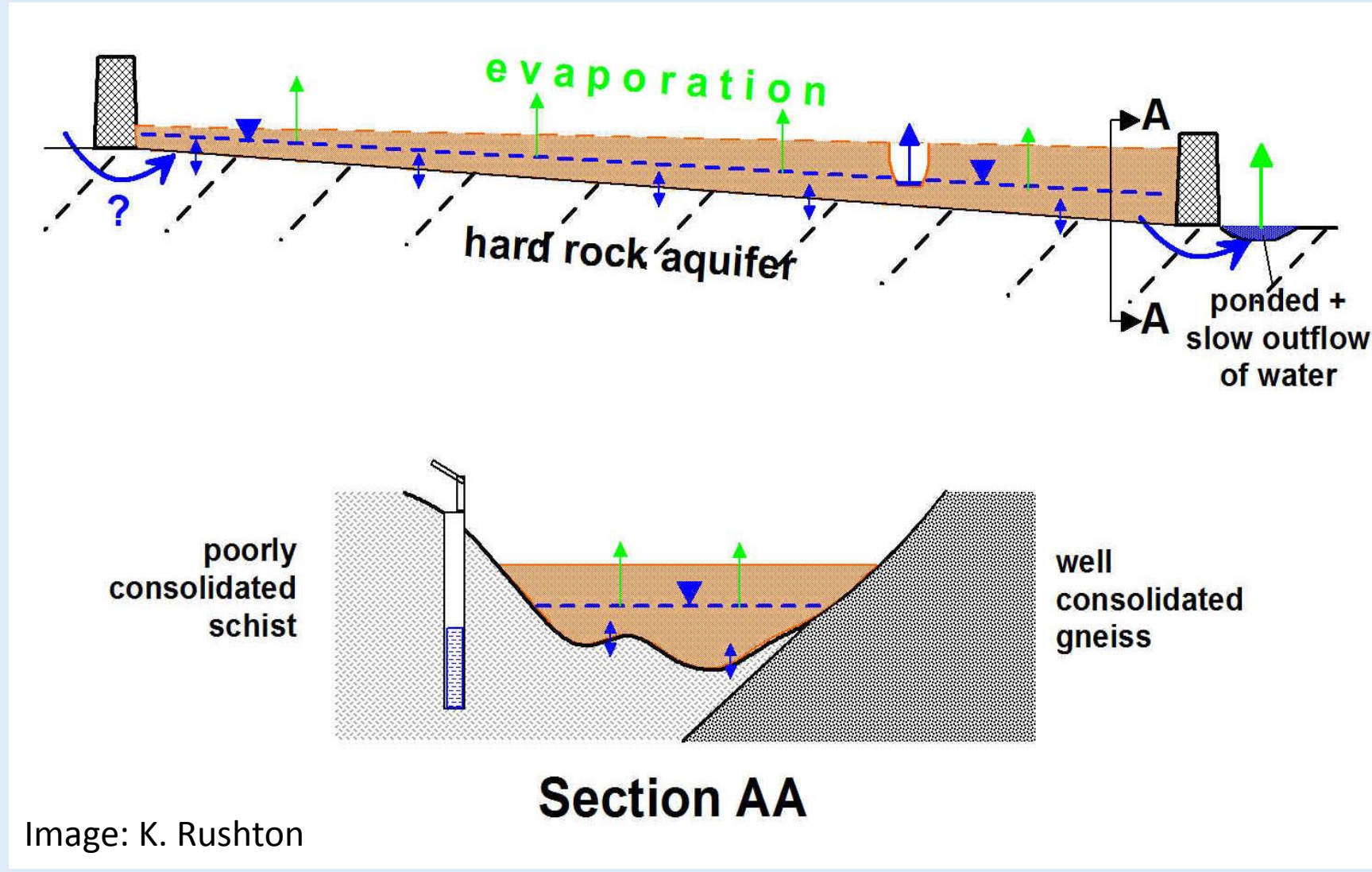




An analysis of the hydrogeological performance of sands dams in Southeastern Kenya

What is a sand dam?

Sand dams are impermeable concrete structures constructed across seasonal rivers that trap both water and sediment behind them, creating an aquifer, storing water for the dry season. The stored water can be accessed by constructing a scoop hole, dug well or borehole upstream of the dam. There are over 500 in Kenya, but the technology is being disseminated worldwide. Previous research has found that the microbiological water quality of the abstracted water is good, but nothing is known about the biological processes that control it.

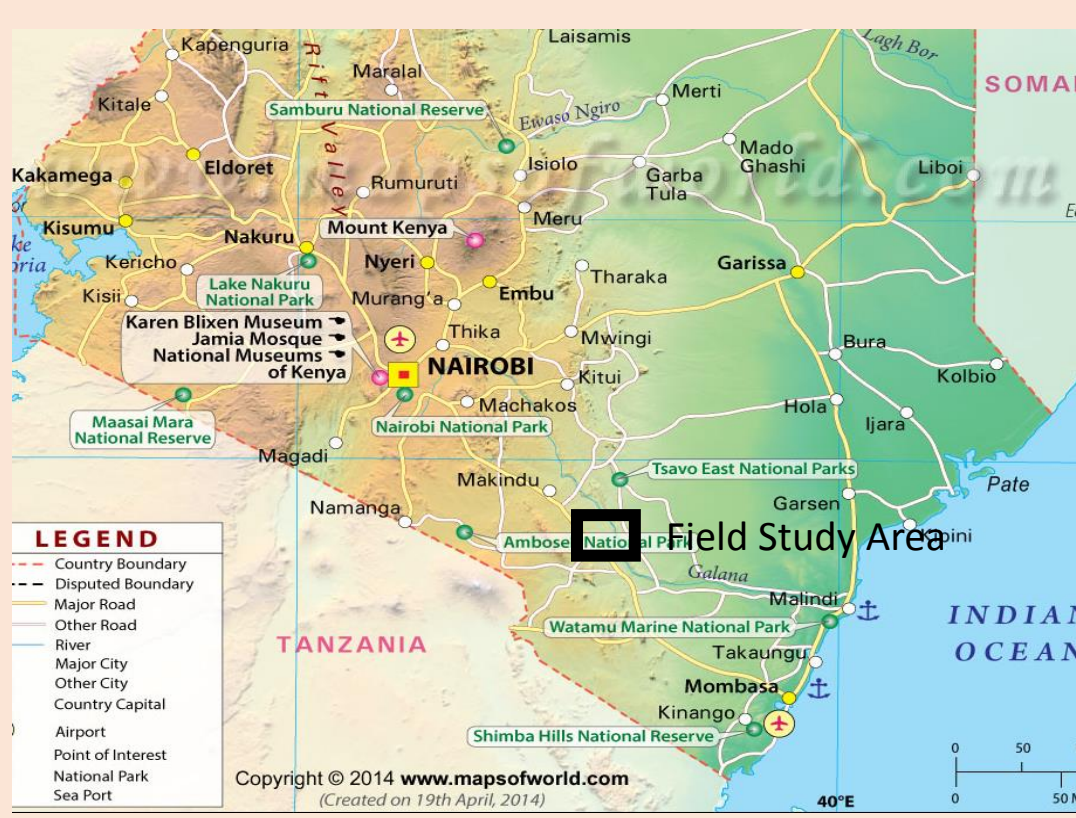


Project aim

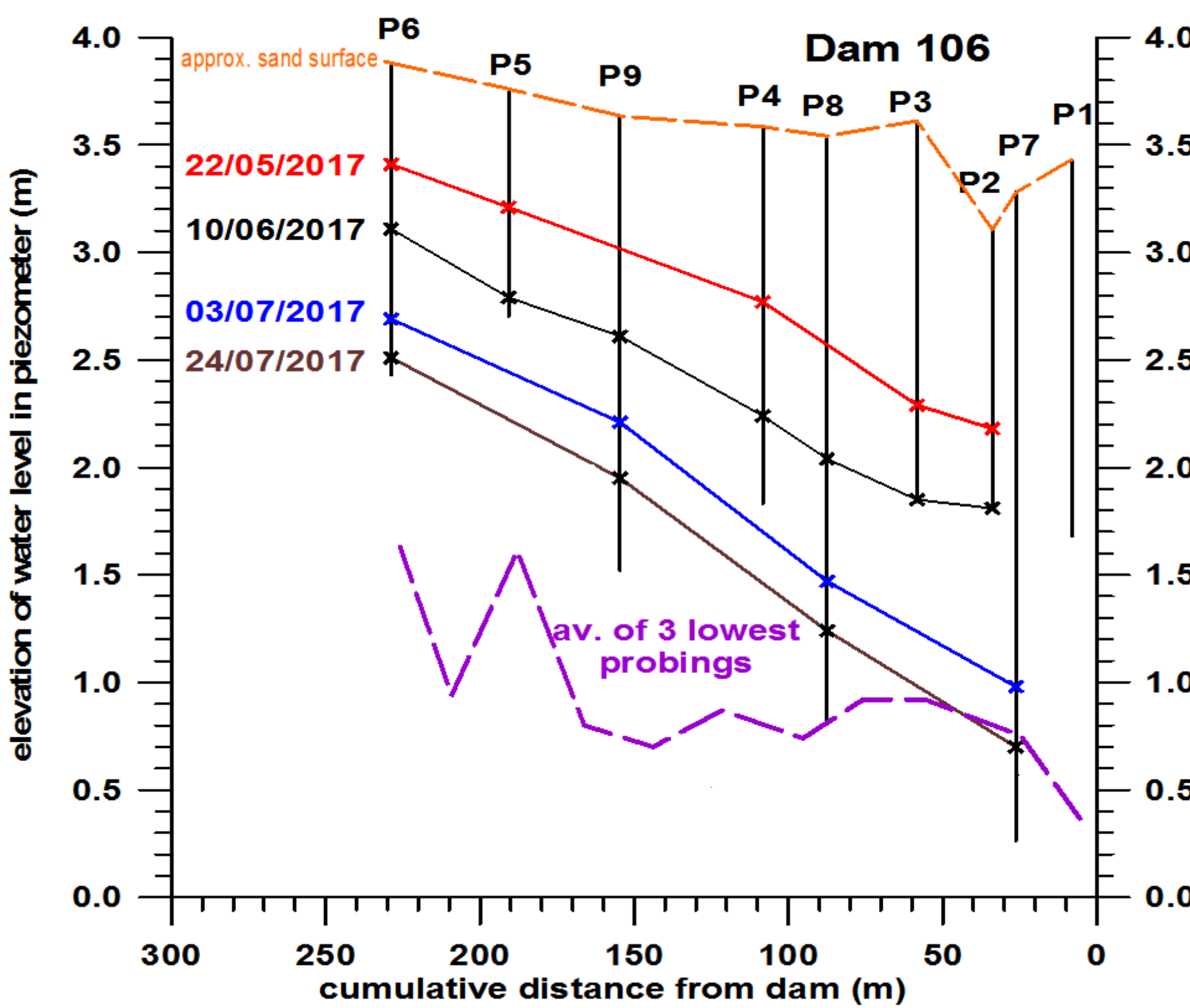
To evaluate the hydrogeological performance of three of sand dams and the quality of the water contained within them.

Method

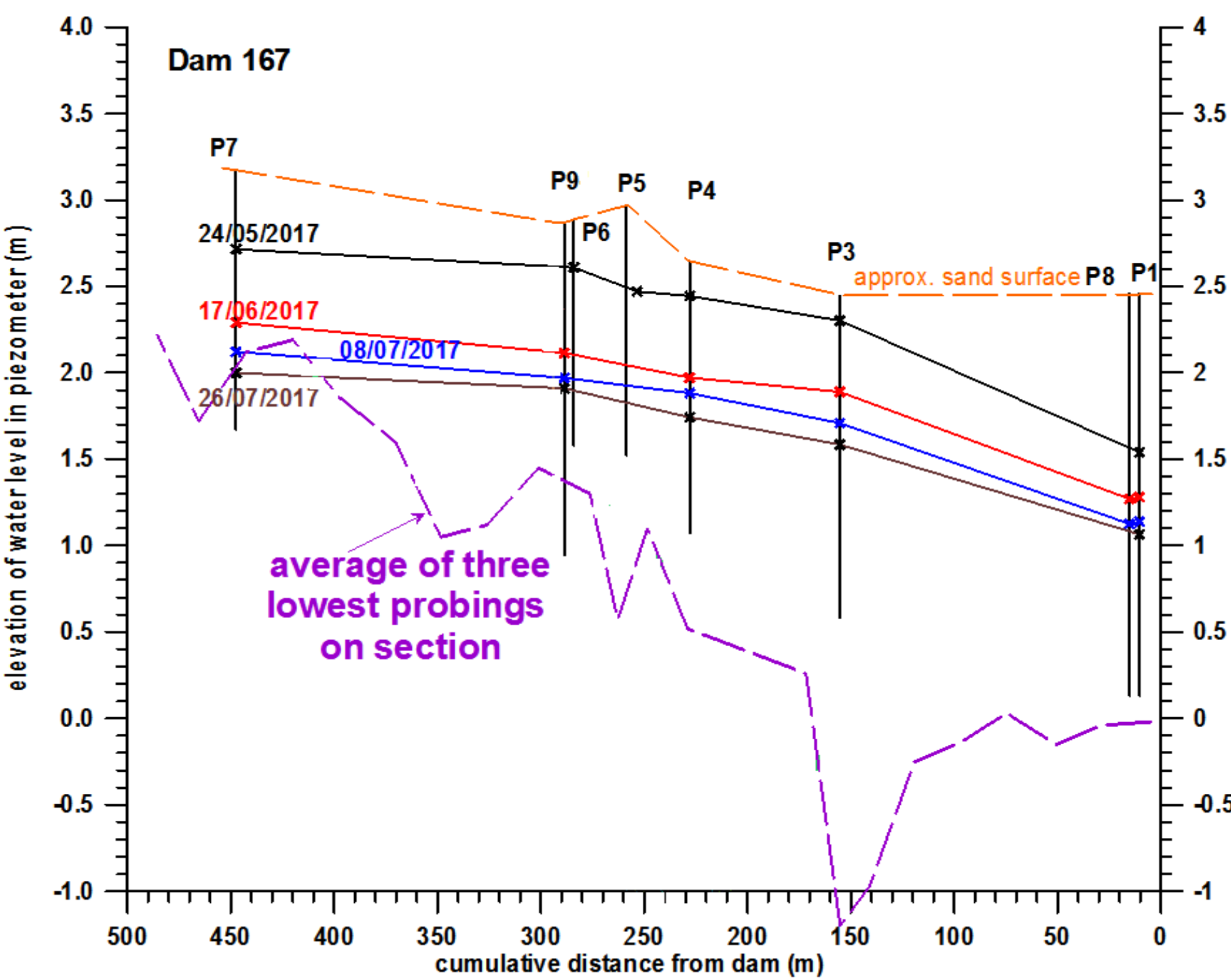
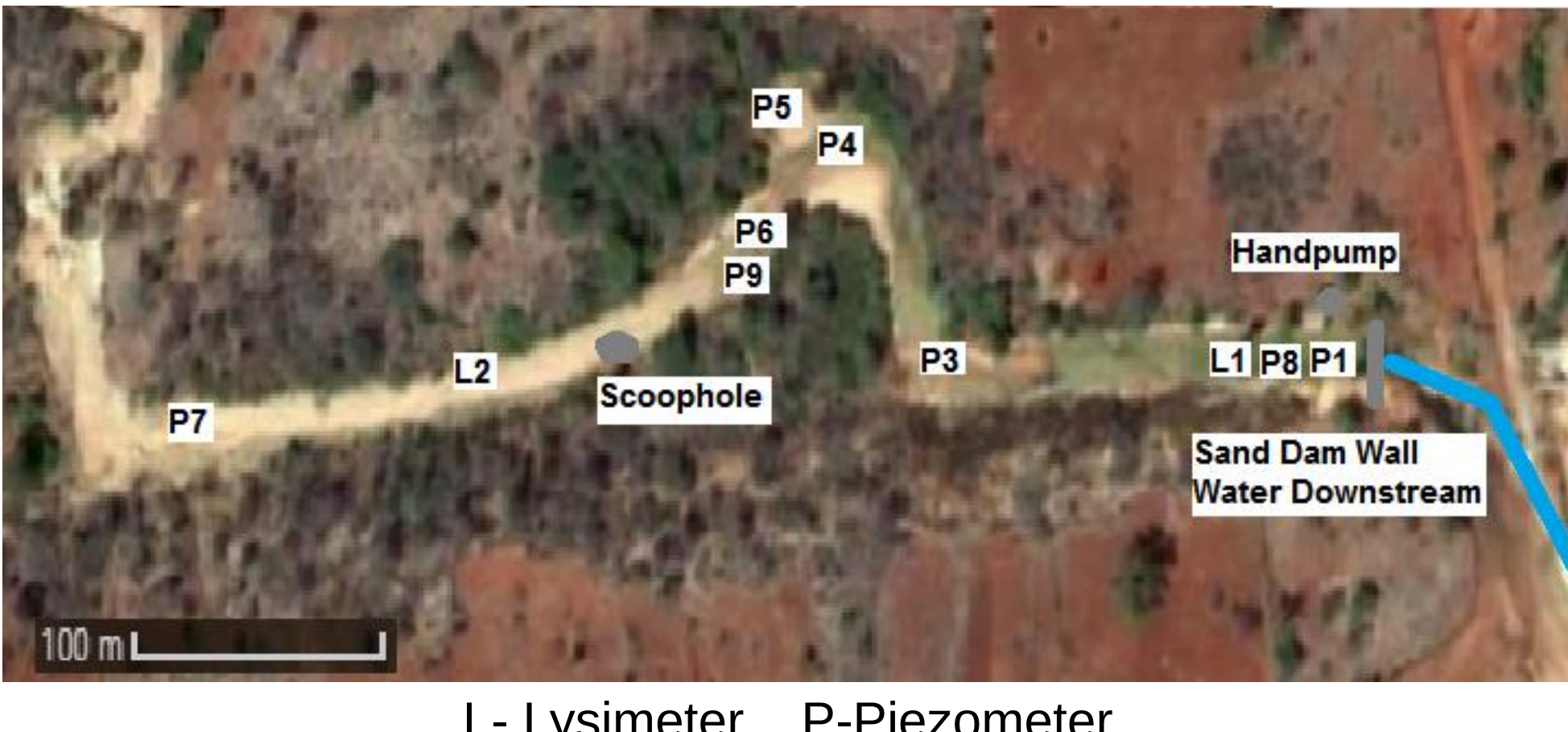
“Successful” sand dams were purposively selected that contained water at the end of the rainy season. Piezometers were installed to monitor water levels throughout the dry season. Conductivity and Thermo-Tolerant Coliform measurements were made at sites where the community were abstracting water.



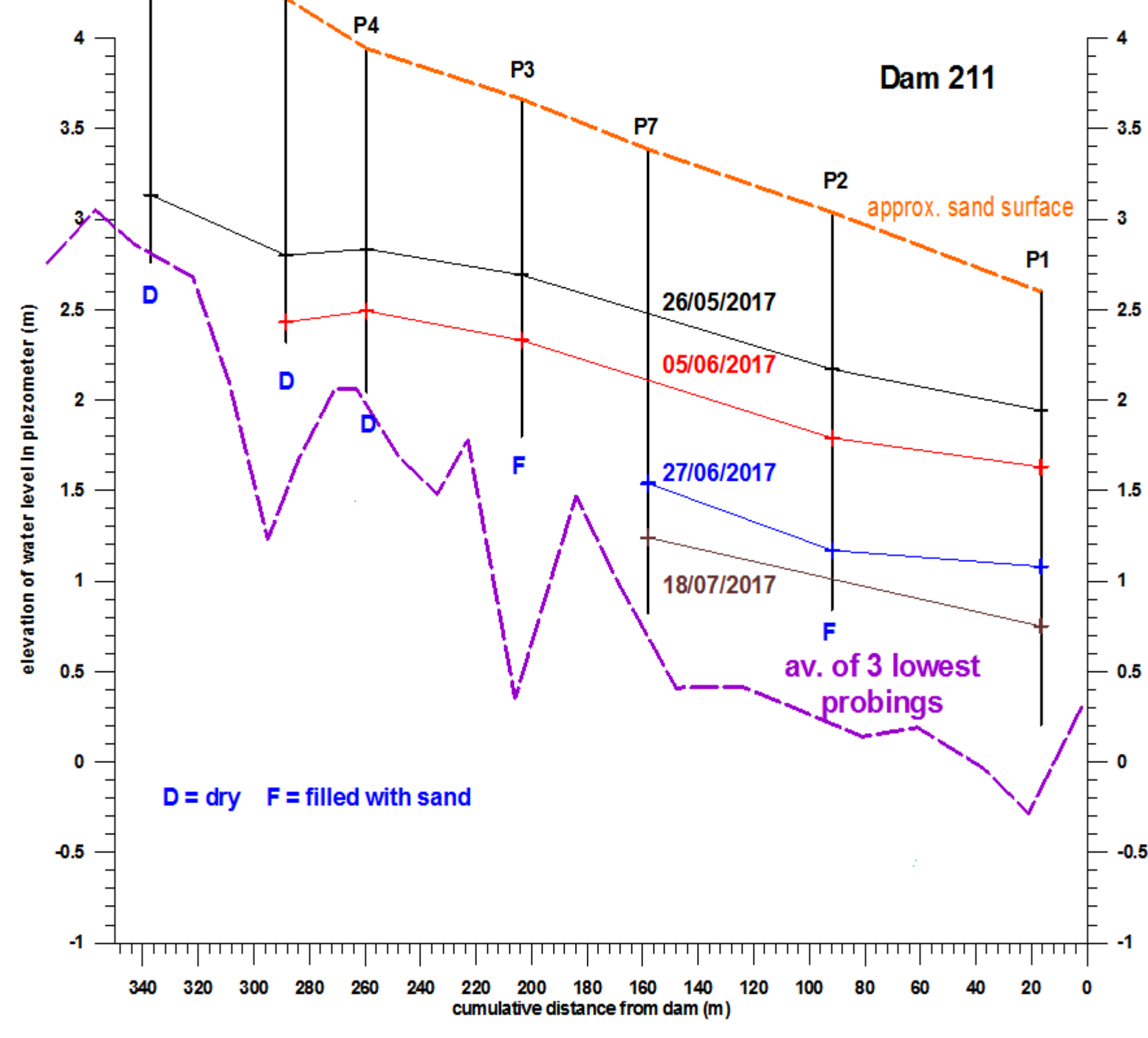
Dam 106 - Ngulai



Dam 167 – Athiani Farmers



Dam 211 – Kipico



Handpump 1.125 mS/cm 0 TTC/100ml	Water Downstream 1.665 mS/cm 155 TTC/100ml	Agricultural Well 2.485 mS/cm
- Household cleaning - Personal hygiene - Drinking (start of dry season only)	- Animal watering - Paid laundry services	- Drinking - Irrigation

Handpump 3.937 mS/cm 2 TTC/100ml	Water Downstream 3.617 mS/cm 35 TTC/100ml	Scoophole 1.32 mS/cm 100 TTC/100ml
Household cleaning	- Irrigation - Animal watering - Brickmaking - Fishing	- Household cleaning - Drinking - Cooking - Personal hygiene

Handpump 2.72 mS/cm 0 TTC/100ml	Agricultural Well 0.44 mS/cm 33 TTC/100ml	Scoophole 0.42 mS/cm 110 TTC/100ml
- Household cleaning - Personal hygiene - Cooking - Drinking (start of dry season only)	- Drinking - Irrigation	- Household cleaning - Personal hygiene - Cooking - Drinking

Conclusion The sand dams lose an average of 1.92m³/day, 0.86 m³/day and 1.1 m³/day respectively. This results in Dam 167 having the greatest water reserves after three months. High salinity in the handpumps adjacent to the sand dams has caused the local populations to use unimproved water sources with greater microbiological contamination (scoop holes and agricultural open wells), but the water also has many non-consumptive uses.

Other Parameters Measured

- Hydraulic Conductivity via Pumping Test
- Proportion of Sand and Clay in Dam
- Sand Grain Size Distribution
- Rates of abstraction
- Evaporation using lysimeters

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