



Scientific realism and wishful thinking in soil hydrology

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In our field we often learn – or could have learned – more from failures than from successes provided we had postulated testable hypotheses to be accepted or rejected. In soil hydrology, hypotheses are testable if independent information quantifying the pertinent system features is at hand. This view on how to operate is an idealized concept of how we could or should have worked. In reality, the path to success is more tortuous and we usually progress differently obeying to other professional musts. Although we missed some shortcuts over the past few decades, we definitely made significant progress in understanding vadose zone progresses, but we could have advanced our system understanding faster by more rigorously questioning the fundamental assumptions. I will try to illustrate the tortuous path of learning and identify some causes of the slowed-down learning curve.

In the pioneering phase of vadose zone research many models have been mapped in our minds and implemented on our computers. Many of them are now well established, powerful and represent the state-of-the-art even when they do not work. Some of them are based on erroneous or misleading concepts. Even when based on adequate concepts they might have been applied in the wrong context or inadequate models may have lead to apparent success.

I address this process of collective learning with the intention that we spend more time and efforts to find the right question instead of improving tools, which are questionably suitable for solving the main problems.