

Winterliche Trockenperioden und Niedrigwasser im schweizerischen Einzugsgebiet des Rheins seit 1540

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Processes involved in the generation of hydrological winter drought within the Upper Rhine basin are investigated. Extremely low water stages were mainly documented through hydrological measurements (since 1808) at Basel, Switzerland. The effect of water released from Alpine reservoirs for power generation was estimated in order to obtain a quasi-homogenous series of “natural flows”. For the period prior to 1808, rocks emerging in rivers and lakes in the case of low water were used along with narrative evidence for assessing extreme events. 29 severe winter droughts are documented since 1540. Such events occurred after a succession of four months with below-average precipitation. A comparison with large-scale seasonal sea-level pressure (SLP) reconstructions revealed that they were often connected to persistent anticyclones centred over Western Europe. Severe winter droughts were relatively rare in the 20th century compared to the former period, which is due to increased winter temperature and precipitation.