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## HYDROLOGICAL DROUGHT – Processes and Estimation Methods for Streamflow and Groundwater

Lena M. Tallaksen<sup>1</sup>, Henny A.J. Van Lanen<sup>2</sup>, Jamie Hannaford<sup>3</sup>, Hege Hisdal<sup>4</sup>, Daniel G. Kingston<sup>5</sup>, Gregor Laaha<sup>6</sup>, Christel Prudhomme<sup>7</sup>, James H. Stagge<sup>8</sup>, Kerstin Stahl<sup>9</sup>, Anne F. Van Loon<sup>10</sup>, and Niko Wanders<sup>11</sup>

<sup>1</sup>University of Oslo, Department of Geosciences, Oslo, Norway (l.m.tallaksen@geo.uio.no)

<sup>2</sup>Hydrology and Quantitative Water Management Group, Wageningen University & Research, P.O. Box 47, 6700 AA Wageningen, The Netherlands

<sup>3</sup>UK Centre for Ecology & Hydrology (UKCEH), Maclean Building, Benson Lane, Crowmarsh Gifford, Wallingford, Oxfordshire, OX10 8BB, United Kingdom

<sup>4</sup>Hydrology Department, Norwegian Water Resources and Energy Directorate (NVE), Middelthunsgate 29, 0301 Oslo, Norway

<sup>5</sup>School of Geography/Te Iho Whenua, University of Otago/Te Whare Wānanga o Ōtākou, PO Box 56 Dunedin 9054, New Zealand/Aotearoa

<sup>6</sup>Institute of Statistics, University of Natural Resources and Life Sciences, Vienna (BOKU), Peter-Jordan-Straße 82/I, 1190 Vienna, Austria

<sup>7</sup>Forecast Department, European Centre for Medium-Range Weather Forecasts (ECMWF), Shinfield Park, Reading, RG2 9AX, United Kingdom

<sup>8</sup>Department of Civil, Environmental and Geodetic Engineering, Ohio State University, 417E Hitchcock Hall, 2070 Neil Avenue, Columbus, OH 43210, USA

<sup>9</sup>Faculty of Environment and Natural Resources, University of Freiburg, Friedrichstraße 39, D-79098 Freiburg, Germany

<sup>10</sup>Water & Climate Risk group, Institute for Environmental Studies (IVM), Vrije Universiteit Amsterdam, De Boelelaan 1111, 1081 HV Amsterdam, The Netherlands

<sup>11</sup>Physical Geography, Utrecht University, Vening Meineszgebouw A, Princetonlaan 8a, Room 4.48, 3584 CB Utrecht, The Netherlands

Drought is a worldwide phenomenon that originates from a prolonged deficiency in precipitation, often combined with high evaporation, over an extended region. The resultant meteorological water balance deficiency may cause a hydrological drought to develop into below normal levels of streamflow, lakes, and groundwater. Contemporary knowledge and experiences from an international team of drought experts are consolidated in a textbook (Tallaksen and van Lanen et al., 2023), which builds on an earlier edition from 2004 (URL 1), with significant new material added. An updated synthesis was requested given the high relevance and severe impacts of drought seen in many regions of the world in recent years, along with the increasing knowledge gained over the last two decades. A majority of these studies focus on climate and climatology approaches, whereas the textbook addresses hydrological drought in particular. The textbook consists of three parts; Part I (Drought as a natural hazard) discusses the drought phenomenon, its main features, regional diversity and controlling processes. Part II (Estimation methods) presents contemporary approaches to drought estimation, including data and hydrological

drought characteristics, statistical analysis of drought series, incl. frequency analysis, time series analysis and regionalisation procedures, as well as process-based modelling. Part III (Living with drought) addresses aspects related to the interactions between water and people. Topics include historical and future drought, how human interventions influence drought, drought impacts and Drought Early Warning Systems. Knowledge and experiences shared in the book are from regions all over the world although somewhat biased to Europe and rivers that flow most of the year.

This presentation aims to introduce the textbook, its motivation and content to a wide audience. The textbook is supported with worked examples and self-guided tours that are elaborated more extensively on GitHub. Worked examples include online procedures, code, and details of the calculation procedures that enable readers to repeat calculations in a stepwise manner, either with their own data or by using online datasets, and we encourage user's feedbacks and experiences in testing these. Self-guided tours are demonstrations of advanced methodologies that involve several calculation steps and are given as online presentations. Four datasets are included on GitHub; an international, a regional and two local datasets. The international dataset illustrates the drought phenomenon and its diversity across the world, whereas regional data and local aspects of drought are studied using a combination of hydroclimatological time series and catchment information. Hopefully, the textbook will contribute to an increased awareness of one of our main natural hazards, and thereby increase the preparedness and resilience of society to drought.