Jul 11th, 9:10 AM - 9:30 AM

webXTREME: a simple web tool for calculating agroclimatic indicators of extreme events

Tommy Klein
Agroscope, Institute for Sustainability Sciences, tommy.klein@agroscope.admin.ch

Argyris Samourkasidis
Democritus University of Thrace, argysamo@gmail.com

Ioannis N. Athanasiadis
Wageningen University, ioannis@athanasiadis.info

Gianni Bellocchi
French National Institute for Agricultural Research, gianni.bellocchi@clermont.inra.fr

Pierluigi Calanca
Agroscope, Institute for Sustainability Sciences, pierluigi.calanca@agroscope.admin.ch

International Environmental Modelling and Software Society (iEMSs)
8th International Congress on Environmental Modelling and Software
Toulouse, France, Sabine Sauvage, José-Miguel Sánchez-Pérez, Andrea Rizzoli (Eds.)
http://www.iemss.org/society/index.php/iemss-2016-proceedings

webXTREME: a simple web tool for calculating agroclimatic indicators of extreme events

Tommy Klein[a], Argyrios Samourkasidis[b], Ioannis N. Athanasiadis[c], Gianni Bellocchi[d], Pierluigi Calanca[a]
[a]*Agroscope, Institute for Sustainability Sciences, Switzerland*
(tommy.klein@agroscope.admin.ch, pierluigi.calanca@agroscope.admin.ch)
[b]*Democritus University of Thrace, Greece (argysamo@gmail.com)*
[c]*Wageningen University, Netherlands (ioannis@athanasiadis.info)*
[d]*Grassland Ecosystem Research Unit, French National Institute of Agricultural Research (gianni.bellocchi@clermont.inra.fr)*

Abstract: Extreme events such as frost, drought or excessive heat occurring during a critical plant stage can cause extensive and sometimes irreversible damages to agricultural production. Tools for gauging the occurrence of extreme events can thus play an important role in the context of agricultural decision problems. Agroclimatic indicators offer simple means to discriminate between favourable and unfavourable conditions. Their evaluation can be supported by dedicated software tools, even though this typically requires local installation of the proposed solution. Here we present webXTREME, a new web-based tool to characterize the occurrence and intensity of extreme events in agriculture (available through www.modextreme.org/webxtreme, accessed on 6 April, 2016). Objectives, which motivated its development, were: ease of access (available from any internet-connected device), simple setup, universal compatibility (no installation required), extensibility and the possibility to offer regular updating services. webXTREME was designed to help scientists and practitioners with various backgrounds to configure the solving algorithms by taking into account plant-specific thresholds and relevant time windows during the growing seasons of arable crops, grasslands and woody species. Graphical display of the results enables comparative assessments, either in space or in time. webXTREME was implemented using Shiny, an open-source web application framework for R. This allows combining the computational power of dedicated R functions with modern web technologies. webXTREME can easily be integrated into other modelling platforms (e.g. BioMA, http://bioma.jrc.ec.europa.eu).

***Keywords**:* extreme events; agroclimatic indicators; R statistical language; Shiny web application framework for R.