Meteorology in Croatia, 2015–2018

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Based on the published books, international peer-review scientific papers and Ph.D. theses, here we present a short overview of the topics of meteorological research in Croatia during the 2015–2018 period. In Croatia, the meteorological research is performed at several institutions: Department of Geophysics, Faculty of Science, University of Zagreb (hereafter, DG), Croatian Meteorological and Hydrological Service (MHS), the Physics Department, Faculty of Science, University of Split (PDS) and the Institute of Oceanography and Fisheries (IOF) in Split. During the reporting period, at these institutions in total forty-six projects (both, completed and still ongoing) were implemented. These were founded by European Union (17 projects), Croatian Science Foundation (12), other sources (9), funds of Cooperative Projects of European Meteorological and Hydrological Services (6) and Ministry of Science and Education of the Republic of Croatia (2). Research efforts resulted in over ninety international peer-review scientific papers, eight Ph.D. theses and several book chapters.

Researchers have addressed a wide span of relevant meteorological issues, such as present and anticipated future climate; turbulence characteristics over inhomogeneous surfaces and complex terrain under various atmospheric conditions; and mesoscale thermal circulations and their interplay with different multi-scale phenomena. Additionally, intensive research activity has been associated with efforts to improve numerical weather and climate prediction models. Severe weather and extreme events, such as, high winds, extraordinary droughts, heat waves, severe convective storms and consequent heavy rainfall, hail, lighting activity and waterspouts, as well as the ability of numerical weather forecast models to predict such episodes, have also been investigated.

Furthermore, a number of interdisciplinary studies dealt with meteorology and closely related disciplines, such as, the air quality, hydrology, oceanography,

physical limnology, agronomy, forestry, energetics and engineering. Among others, impacts of weather and/or climate on the air and precipitation quality, agricultural and forest systems, ocean currents, sea-level variability and occurrence of the storm surges and meteotsunamis were investigated. Within the framework of meteotsunami research, new equipment (two weather stations and six microbarographs) was installed at several coastal locations and an operational one-way coupled numerical atmosphere-ocean model for forecast of the Adriatic meteotsunamis was developed. The observed data can be visualized at http://faust.izor.hr/autodatapub/postaje2 and downloaded from http://faust.izor.hr/autodatapub/mjesustdohvatpod?jezik=eng, while meteotsunami forecasts are available at http://faust.izor.hr/autodatapub/adrisc?jezik=eng.

Overall, meteorological community was very active during the reporting period. International and national inter-institutional cooperation was intense. Furthermore, research results were based on the state-of-the-art methodologies. Finally, some of the studies provided information on specific phenomena for Croatia for the first time (e.g., lighting activity and waterspouts events). Additional information on the conducted research is available at the web sites of individual institutions: http://www.pmf.unizg.hr/geof/en (DG), https://meteo.hr/index_en.php (MHS), https://www.pmfst.unist.hr/odjel-za-fiziku/ (PDS) and http://www.izor.hr/web/guest/home (IOF).

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List of publications

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