



Abstract

The AIHABs Project: Towards an Artificial Intelligence-Powered Forecast for Harmful Algal Blooms [†]

Fernando Cobo ^{1,*}, Rufino Vieira-Lanero ¹, Sandra Barca ¹, María del Carmen Cobo ¹, Antonio Quesada ², Ahmed Nasr ³, Zeinab Bedri ³, Marcos Xosé Álvarez-Cid ⁴, Mohammadmehdi Saberioon ⁵, Jakub Brom ⁶ and Begoña Espiña ⁷

¹ Department of Zoology, Genetics and Physical Anthropology, Universidade de Santiago de Compostela (USC), 15782 Santiago de Compostela, Spain; rufino.vieira@usc.es (R.V.-L.); sandra.barca@usc.es (S.B.); mariadelcarmen.cobo@usc.es (M.d.C.C.)

² Department of Biology, Universidad Autónoma de Madrid (UAM), 28049 Madrid, Spain; antonio.quesada@uam.es

³ Department of Civil & Structural Engineering, Technological University Dublin (TU Dublin), Bolton Street, D01 K822 Dublin, Ireland; ahmed.nasr@tudublin.ie (A.N.); zeinab.bedri@tudublin.ie (Z.B.)

⁴ Department of Computer Science (IDI), Norwegian University of Science and Technology (NTNU), Teknologivegen, 22, 2819 Gjøvik, Norway; marcos.alvarez@ntnu.no

⁵ Remote Sensing and Geoinformatics, Helmholtz-Centre Potsdam, GFZ German Research Centre for Geosciences, Telegrafenberg, 14473 Potsdam, Germany; saberioon@gfz-potsdam.de

⁶ Department of Landscape Management, University of South Bohemia in České Budějovice (USB), Branišovská 31a, 37005 Czech Budejovice, Czech Republic; jbrom@zf.jcu.cz

⁷ Water Quality Group, International Iberian Nanotechnology Laboratory (INL), Av. Mestre José Veiga s/n, 4715-330 Braga, Portugal; begona.espina@inl.int

* Correspondence: fernando.cobo@usc.es

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[‡] Presenting author (poster).



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Abstract: Eutrophication of water bodies in Europe is contributing to the increase of Harmful Algal Blooms (HABs) which pose a serious risk to human health. To address this problem, the AIHABs project will develop an early warning forecasting system to predict the occurrence, spread and fate of cyanotoxins caused by HABs in inland and coastal waters, using Artificial Intelligence (AI) and the latest innovations in mathematical modelling, nanosensors, and remote sensing. The system predictions will allow timely action to minimise the risks of consuming surface waters or using them as recreational resources when the water bodies are prone to producing toxic cyanobacterial blooms. Following a multi-criteria analysis, two sites with a history of HABs (one in Spain and one in the Czech Republic) were identified as the most suitable inland and coastal water sites for the study. The main criteria for site selection were the availability of the catchment required data for modelling, the strong evidence of historical HABs, the ease of satellite monitoring of water bodies and accessibility for water sampling. Samples will be taken, synchronously with satellite image acquisition, during, before and after algal blooms. In addition, current and historical data from the selected catchments will be included in a prediction model using the MIKE HYDRO River software, and innovative nanosensors will be designed to determine the concentration of cyanotoxins. Finally, an early warning forecasting system will be developed to predict the occurrence, spread and fate of cyanotoxins caused by HABs in water bodies.

Keywords: cyanotoxin; modelling; nanosensors; remote sensing

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