**Water Quality Information for the Benefit of Society**

**Earth Observation of inland and coastal water quality: recent developments, priorities & public engagement**

29-31 August 2018, University of Stirling, Stirling, UK

*a joint meeting co-organised by* [*GEO AquaWatch*](https://www.geoaquawatch.org/) *& the* [*NERC GloboLakes*](http://www.globolakes.ac.uk/) *project*

GEO AquaWatch and GloboLakes invite contributions to a workshop from the developer and user communities of Earth Observation (EO) data in inland and coastal environments.

Inland and near-shore coastal environments deliver multiple ecosystem services that benefit society, including food, water, energy, navigation and recreation resources that contribute to our economies, whilst also being crucial to regional and global-scale biogeochemical cycles. Freshwater availability is ranked among the greatest threat to global economy, and yet only a fraction of global inland water systems are routinely monitored for water quality.

The United Nations development agenda now fully recognises the importance of managing water resources to reach sustainable development goals (SDG 6, and related) and fosters collaboration across countries. Global Climate Observing System (GCOS) also recently deemed satellite-derived lake temperature, ice cover, and water-leaving reflectance as Essential Climate Variables. Data collection by EO satellites is expanding, and its suitability for observing inland and near-coastal water bodies makes remote sensing a valuable source of data on water quality and ecosystem condition at local and global scales. The workshop marks the culmination of the six-year GloboLakes project funded by the UK Natural Environmental Research Council, and featuring the latest applications of EO to inland and near-shore coastal waters at local, regional and global scales and contributions to improved water management, climate studies, and achieving SDGs. We will foster discussions of data and technology challenges, linkages between EO data providers and stakeholders, community-based water monitoring, and future GEO AquaWatch activities. The workshop will have presentations from many international projects and partnerships, providing unique opportunity to engage with the international water quality EO community.

**Logistics:** When: 29-31 August 2018

**Where:** Stirling UK (~30 miles from Edinburgh airport)

**Registration:** Cost of Accommodation and Meals £85 per day

Please Click [HERE](https://shop.stir.ac.uk/product-catalogue/faculties/faculty-of-natural-sciences/biological-and-environmental-sciences) to register and book and pay accommodation and meal

**Deadline** 31st July 2018.

**Organising Committee**:

Andrew Tyler: University of Stirling, UK

Evangelos Spyrakos: University of Stirling, UK

Steve Greb: GEO AquaWatch, USA

Carsten Brockmann: Brockmann Consult, Germany

Ghada El Serafy: Deltares, Netherlands

Douglas Cripe: GEO Secretariat, USA

Merrie Beth Neely: GEO AquaWatch, USA

**Final Programme**

**28th August 2018 Arrivals – Willow Court**

[**http://www.stirlingvenues.com/accommodation/guest-accommodation/**](http://www.stirlingvenues.com/accommodation/guest-accommodation/)

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| 15:00 pm | check-in begins Willow Court (Stirling Hotel is 2pm) |
| 17:00 pm | GEO AquaWatch Pre-Meeting **Pathfoot Building**  Meet & Greet of AquaWatch participants and background information (Greb/Neely) |
| 19:00 pm | Welcome Dinner and Reception |

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**29th August 2018 Day 1 - GloboLakes - Pathfoot Building**

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| 9:00-9:30 am | Registration and Coffee |
| Welcome | |
| 9:30-9:35 | Welcome: Vice Chancellor |
| 9:35-9:40 | Introduction and House Keeping: Andrew Tyler |
| 9:40-9:50 | AquaWatch Overview: Steve Greb |
| **Session 1: GloboLakes: The Development** Chair: Steve Greb | |
| 9:50-10:00 | GloboLakes: The Overview: Andrew Tyler |
| 10:00-10:15 | Optical Water Types and LIMNADES: Vagelis Spyrakos |
| 10:15-10:30 | Algorithm Development at the Global Scale: Water Quality: Peter Hunter |
| 10:30-10:45 | Lake Surface Water Temperature: Laura Carerra |
| 10:45-11:00 | Discussion |
| 11:00-11:20 | Tea and Coffee |
| **Session 2: GloboLakes: Data Processing and Analysis** Chair: Carsten Brockmann | |
| 11:20-11:35 | Near Real Time Data Processing and Calimnos: Stefan Simis |
| 11:50-12:05 | Estimating Drivers of Change: Mark Cutler |
| 12:05-12:20 | Dealing with Data Uncertainty: Claire Miller |
| 12:20-12:35 | Clustering Lake Responses to Environmental Change: Mengyi Gong |
| 12:35-13:00 | Discussion |
| 13:00-14:00 | Lunch |
| **Session 3: GloboLakes: Understanding Change** Chair: Paul DiGiacomo | |
| 14:00-14:15 | Status and Attribution of lake Water Quality: Laurence Carvalho |
| 14:15-14:30 | Global forecast of the sensitivity of lake phytoplankton to environmental change: Ian Jones |
| 14:30-14:45 | Global seasonality of lake phytoplankton: Ellie Mackay |
| 14:45-15:00 | Predicting Lake Surface temperature dynamics: Stephen Maberly |
| 15:00-15:20 | Discussion |
| 15:20-15:40 | Tea and Coffee |
| **Session 4: GloboLakes: Wrap Up** Chairs: Andrew Tyler & Steve Greb | |
| 15:40-16:00 | Questions and Discussion |
| 16:00-16:20 | Summary, next steps and opportunities |
| 16:20-17:00 | Advisory Board Meeting |
| **17:30** | **Coaches Depart for Loch Venachar: Bus Stop at Pathfoot** |
| **18:30** | **Dinner followed by Whisky Tasting** |
| **22:30** | **Coaches return to the University** |

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**30th August 2018 Day 2- Water Quality Community Forum - Pathfoot**

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| 9:00-9:15 am | Introduction: Chair Paul DiGiacomo  *10 minute lightning round talks, followed by topical posters & booth interaction and panel discussion with attendees* |
| **Session 5: Partner Projects & Developments Lightning Talks** | |
| 9:15-9:25 | NERC Knowledge Exchange: EO in Industry and Regulation - Claire Neil/Andrew Tyler |
| 9:25-9:35 | H2020 EOMORES – Steef Peters |
| 9:35-9:45 | H2020 Copernicus Global Land – Kerstin Stelzer |
| 9:45-9:55 | H2020 MONOCLE – Stefan Simis |
| 9:55-10:05 | H2020 CoastObs – Steef Peters |
| 10:05-10:15 | H2020 Coastal Water Data Cube – Carsten Brockmann |
| 10:15-10:25 | H2020 DANUBIUS-PP – Andrew Tyler |
| 10:25-11:35 | Tea and Coffee with posters and booth interaction |
| **Session 6: H2O2O Community Discussion** Facilitator: Arnold Dekker | |
| 11:35-12:30 | Presenter Panel Discussion and Q&A. |
| 12:30-13:30 | Lunch |
| **Session 7: Agency & International Program Lightning Talks** Moderator: Emily Smail | |
| 13:30-13:40  13:40-13:50  13:50-14:00  14:00-14:10  14:10-14:20  14:20-14:30  14:30-14:40  14:40-14:50  14:50-15:00 | UNESCO World Water Quality Portal – Thomas Heege  Water-related SDGs – Bilqis Hogue/Doug Cripe/Merrie Beth Neely  GEMS Water and SDGs – Debbie Chapman  US CyAN project – Blake Schaeffer  US CoastWatch – Paul DiGiacomo  CEOS EO for Aquatic Ecosystems Study – Arnold Dekker  Trophic state assessment of global inland waters using a MODIS-derived Forel-Ule index. - Shenglei Wang  Relevance of thermal forcing for optical remote sensing of stratified lakes - Daniel Odermatt  Spatial and Temporal Perspectives on Multiple Stressor Impacts Spanning Inland to Coastal Ecosystems - John Schalles |
| 15:00-15:45 | Tea and Coffee with poster and booth interaction |
| **Session 8: Community Discussion** Facilitator: Blake Schaeffer | |
| 15:45-16:30 | Presenter Panel Discussion and Q&A. Discuss challenge/opportunity |
| **Session 9: GEO AquaWatch Setting the Scene for Day 3**  Co-chairs: Steve Greb, Paul DiGiacomo, Arnold Dekker | |
| 16:30-17:20 | Introductions, Review of the GEO Model, GEO AquaWatch Progress |
| **19:00** | **Dinner** |
| **20:30** | **CEILIDH** |

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**31st August 2018 Day 3- GEO AquaWatch – Pathfoot Building**

*This day is a working session to engage the Steering Committee and Community in review, discussion and planning activities for the coming year. The day is split into two parts. The first session will focus on building GEO AquaWatch’s flagship water quality information service and discuss an action plan to fund and complete work packages 3-7. The second session will identify new issues/activities and further discuss the action plan to fund and address both the WQIS and new activities. The final session, chaired by the entire Steering Committee, will assign tasks for the GEO AquaWatch Annual Workplan.*

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| 9:00-9:10 am | Recap **challenges and opportunities** from previous 2 days. How can the community activities presented over the past two days help GEO AquaWatch reach its goals? How can GEO AquaWatch help the community reach their goals? |
| **Session 9: Water Quality Information Service (WQIS) Plenary** Group Discussion | |
| 9:10-10:30 | Review of Work Packages 3-7. Detailed group discussion of the **WQIS** and tasks to completion for a global product. (Facilitators: Ghada El Serafy and Carsten Brockmann) |
| 10:30-11:00 | Tea and Coffee |
| **Session 10: Working Group Breakouts –** Working Group Co-Chairs | |
| 11:00-11:50 | How can GEO AquaWatch address the identified action & knowledge gaps? What new issues can/should GEO AquaWatch address in next 12-18 months and how do we do it? |
| 11:50-12:00 | Break |
| 12:00-13:00 | Working lunch (continuation of **Working Group Breakouts**) |
| 13:00-13:15 | Break |
| **Session 11: Annual Work Plan & Assignments Plenary** Chairs: Entire Steering Committee | |
| 13:15-13:40  13:40-15:00 | Work Group Co-Leads Report Out – 5 mins each  **Steering Committee Feedback and Plenary Discussion:** How will identified knowledge/action gaps shape GEO AquaWatch Annual Workplan? Build a Framework to implement agreed upon tasks, schedule next 12-18 months, and assign people to tasks. |
| 15:00-15:10 | Farewell Thoughts |