



**Tuesday 2 March 2021 – Thursday 4 March 2021**

**Background and workshop programme**



## The Context

To discuss approaches to the collection, analysis and dissemination of benthic imagery, The Joint Nature Conservation Committee brought together 29 organisations from across the marine monitoring and assessment community in the UK, and beyond (government, research and academia, and private consultancies), for a workshop on 19–22 March 2019. Called '[The BIG PICTURE](#)', the workshop enabled experts to grapple with a broad range of issues over three days, seeking collaborative solutions and opportunities, while considering how to incorporate new technologies, such as computer vision and machine-learning, into existing workflows.

The two main outcomes of the BIG PICTURE Workshop were the creation of the [UK's Benthic Imagery Action Plan](#) and the formation of the Big Picture Group. The Benthic Imagery Action Plan collates and focuses all recommendations from the Big Picture Workshop into 87 work tasks, organised into seven coherent workflows (including one for imagery data management). The Action Plan is endorsed by UK's Healthy & Biologically Diverse Seas Evidence Group (HBDSEG), and progress towards it is reported to North East Atlantic Marine Biological Analytical Quality Control Scheme (NMQAQC). The Big Picture Group is an cross-organisation, interdisciplinary benthic imagery working group tasked with implementing the Action Plan. Work within this Group is carried out by cross-organisation Project Working Groups (PWG), each focused on a different theme. These are currently:

- Identification approaches for benthic imagery
- Benthic imagery data flows, archives and catalogues
- Imagery annotation software
- Artificial intelligence approaches for benthic imagery
- Benthic imagery workflow guidance
- Benthic imagery analysis training scheme
- Enumeration approaches for benthic imagery taxa
- Quality Assurance Framework for benthic imagery

The main point of contact for each of these PWGs periodically reports progress and flags up issues to the newly formed Action Plan Coordination Committee. This Committee provides an internal governance framework for the Big Picture Group and a means for sharing progress across the whole Group. The BIG PICTURE II is the second large collaborative event to be held with the Big Picture Group over the past two years and represents a major milestone in efforts to progress the implementation of Benthic Imagery Action Plan.



## The Workshop

**Bringing people together to share progress and discuss challenges of benthic imagery innovation and collaboration is where 'The BIG PICTURE II' Workshop comes in** – engaging a wide group of stakeholders from the wider marine monitoring and survey community in the UK. We'll share our knowledge and experience of working together for two years within the 'Big Picture Group' to develop a collaborative, coordinated Benthic Imagery Action Plan for the UK and commence its implementation. By the end of our three days we hope to have a good, common understanding of our progress towards the Action Plan and what the future will look like.

The outputs from the workshop will be collated and synthesised into a workshop report (which you will receive). All sessions and presentations will also be recorded and posted on the workshop webpage for future reference: <https://jncc.gov.uk/news/big-picture-ii/>

### Workshop objectives:

1. Share progress towards achieving Benthic Imagery Action Plan with Big Picture Group;
2. Identify effective funding routes for Project Working Groups;
3. Identify global outreach opportunities to enrich and support Project Working Groups;
4. Identify future challenges to delivery of Benthic Imagery Action Plan and propose solutions.

### Facilitation and working style:

The workshop facilitation is being led by JNCC staff, who will introduce presenters and facilitate discussions in each session towards achieving the objectives of the workshop. They have been designing and preparing the workshop, bringing their experience of collaborative working from previous experiences with the Big Picture Group.

This workshop will focus on sharing of information, through presentations, and follow on with ample opportunities to ask questions and make suggestions. A spirit of enquiry and willingness to listen and learn, as well as contribute your own knowledge and ideas, will help enormously. Progress will be made with some purpose and in line with our planning, but will be flexible in the face of what actually comes up.



## Programme summary

### Day one: Tuesday, 2 March

Time	Session
0930 – 1030	Welcome, practicalities, working style and programme Reviewing the context and background, aims and objectives of the workshop
1030 – 1100	Tea & coffee break
1100 – 1200	<p><b>Session 1: The journey from BIG PICTURE to BIAP to Big Picture Group to Project Working Groups (PWGs)</b> Session facilitator: <b>Kirsten Dinwoodie</b></p> <p>Presentations (by Henk van Rein; Joint Nature Conservation Committee):</p> <ul style="list-style-type: none"> <li>• Development of a UK Benthic Imagery Action Plan</li> <li>• Formation of the Big Picture Group</li> <li>• Project Working Groups and looking ahead</li> </ul> <p>Questions on presentations, funding opportunities, global outreach and next steps</p>
1200 – 1300	Lunch
1300 – 1500	<p><b>Session 2: Early successes of BIAP: Benthic imagery purposes, Quality Assurance Framework, Epifauna Identification Protocol</b> Session facilitator: <b>Joey O'Connor</b></p> <p>Presentations:</p> <ul style="list-style-type: none"> <li>• Development of standard benthic imagery purposes – Henk van Rein (JNCC)</li> <li>• Development of Quality Assurance Framework – Jess Taylor (JNCC) and Graeme Duncan (JNCC)</li> <li>• The Epifauna Identification Protocol – Jess Taylor (JNCC)</li> </ul> <p>Questions on presentations, funding opportunities, global outreach and next steps</p>
1500 – 1530	Tea & coffee break
1530 – 1600	Day one summaries and close



**Day two: Wednesday, 3 March**

Time	Session
930 – 1000	Arrival and plan for the day
1000 – 1200	<p><b>Session 3: BIAP progress in the digital realm: AI, Data flows and Catalogues</b></p> <p>Session facilitator: <b>Jess Taylor</b></p> <p>Presentations:</p> <ul style="list-style-type: none"> <li>• Artificial intelligence approaches for benthic imagery – Kerry Howell (University of Plymouth)</li> <li>• Benthic imagery data flows – Dan Lear (Marine Biological Association of the UK / Data Archive for Seabed Species and Habitats)</li> <li>• Benthic imagery catalogues – Graeme Duncan (JNCC)</li> </ul> <p>Questions on presentations, funding opportunities, global outreach and next steps</p>
1200 – 1300	Lunch
1300 – 1500	<p><b>Session 4: Continual progress of BIAP in day-to-day analysis: Annotation, Identification and Enumeration</b></p> <p>Session facilitator: <b>Steph Gollob</b></p> <p>Presentations:</p> <ul style="list-style-type: none"> <li>• Identification approaches used for benthic imagery data – Joey O’Connor (JNCC)</li> <li>• Enumeration approaches used for benthic imagery data – Jon Hawes (Centre for Environment, Fisheries and Aquaculture Science)</li> <li>• Imagery annotation software – Mark Burton (Natural Resources Wales)</li> </ul> <p>Questions on presentations, funding opportunities, global outreach and next steps</p>
1500 – 1530	Tea & coffee break
1530 – 1600	Day two summaries and close

**Day three: Thursday, 4 March**

<b>Time</b>	<b>Session</b>
930 – 1000	Arrival, recap Plan for the final day
1000 – 1200	<p><b>Session 5: Training, standards and acquisition approaches for the future</b></p> <p>Session facilitator: <b>Kirsten Dinwoodie</b></p> <p>Presentations:</p> <ul style="list-style-type: none"> <li>• Training approaches for deep sea imagery – Jaime Davies (University of Plymouth)</li> <li>• Development of benthic imagery workflow guidance – Ross Bullimore (Cefas) and Mike Fraser (Natural England / Environment Agency)</li> <li>• Overview of benthic imagery acquisition approaches – Henk van Rein (JNCC)</li> </ul> <p>Questions on presentations, funding opportunities, global outreach and next steps</p>
1200 – 1300	Lunch
1300 – 1500	<p><b>Session 6: The future of The BIG PICTURE</b></p> <p>Session facilitator: <b>Henk van Rein</b></p> <p>Summaries of all funding, global outreach and next steps from all five sessions presented by session facilitators (Kirsten Dinwoodie, Joey O'Connor, Jess Taylor and Steph Gollob)</p> <p>Break out discussions of key topics focusing on future delivery of Benthic Imagery Action Plan</p>
1500 – 1530	Tea & coffee break
1530 – 1600	Workshop close



## Governance and links

The Benthic Imagery Action Plan is embedded within the North-East Atlantic Marine Biological Analytical Quality Control Scheme (NMBAQC) and is endorsed by the Healthy and Biologically Diverse Seas Evidence Group (HBDSEG). All new standards and protocols that arise from the Action Plan are published via the NMBAQC, who have a central role in maintaining standards and advice across the UK.

Existing established groups and bodies involved :

Organisation	Type of organization and role
Healthy and Biologically Diverse Seas Evidence Group (HBDSEG)	The HBDSEG exists within the UK Marine Monitoring and Assessment Strategy (UKMMAS) and reports to the Monitoring and Assessment Reporting Group (MARG).
North-East Atlantic Marine Biological Analytical Quality Control Scheme (NMBAQC)	The NMBAQC coordinate the development and implementation of analytical standards for UKMMAS, and periodically report to HBDSEG. The NMBAQC role is to support the Benthic Imagery Action Plan and to endorse the standards that arise from it. Any new standards and protocols will be published via the NMBAQC.
Interagency Marine Monitoring Group (MMG)	The MMG coordinate the research and development of marine monitoring methods and tools for use by the Statutory Nature Conservation Bodies for the UK. Their role is to advise and support to the project through representatives common to both MMG and the workshop.

Individual organisations involved in the Big Picture Group:

Organisation	Type of organisation
Joint Nature Conservation Committee (JNCC) Natural Resources Wales (NRW) Natural England (NE) NatureScot (NS) Marine and Fisheries Division, Department of Agriculture, Environment and Rural Affairs (DAERA)	Statutory Nature Conservation Bodies for the UK (note DAERA is also a devolved government department in Northern Ireland)
Agri-Food Biosciences Institute (AFBI) Centre for Environment, Fisheries and Aquaculture Science (CEFAS) Marine Scotland Science (MSS)	Government-funded research institutes

Organisation	Type of organisation
Eastern Inshore Fisheries and Conservation Authority (IFCA) Environment Agency (EA) Scottish Environmental Protection Agency (SEPA)	Government-funded environmental protection agencies and fisheries authorities
Marine Biological Association of the UK (MBA) National Oceanography Centre (NOC) Scottish Association for Marine Science (SAMS) Wageningen Marine Research (Netherlands)	Independent marine research institutes
Heriot-Watt University University of East Anglia University of Edinburgh University of Plymouth University of Southampton University of Ulster	Universities with academic researchers working in various fields of marine benthic imagery analysis
APEM Aquarius Survey and Mapping Aquatic Survey and Monitoring Limited (ASML) Bureau Waardenburg BV (Netherlands) Cloudbase Productions Ecospan Environmental Limited Envision Mapping Limited Fugro GB Marine Limited Gardline Ocean Ecology Oceansturn Precision Marine Seastar Survey Limited	Environmental consultancies (organisations and independents)
SubCImaging	Hardware developer
Department of Environmental, Farming and Rural Affairs (DEFRA) Rijkswaterstaat (Ministry for Infrastructure and Water Management; Netherlands)	Government Departments