

# KEPLER

## Project Handbook



Version 4  
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of the European Union

[www.kepler-polar.eu](http://www.kepler-polar.eu)



## KEPLER Project Handbook

This document is designed as an aid to communication and reporting guidelines for KEPLER. It is a summary of key points from the Annex 1 to the Grant Agreement with the EU – the Description of Action (DoA), which is the full legal document. For full descriptions of tasks, partners, budgets, etc., please refer to the DoA.

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## Project overview

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**KEPLER** (Key Environmental monitoring for Polar Latitudes and European Readiness) is a multi-partner initiative, built around the operational European Ice Services and Copernicus information providers, to prepare a roadmap for Copernicus to deliver an improved European capacity for monitoring and forecasting the Polar Regions.

Our motivation is to put the public and stakeholders at the centre of Copernicus. This follows the recommendations of the 'Copernicus User Uptake' review, and its 4 themes of:

- Raising awareness for the Copernicus programme (see KEPLER WPs 1, 2 and 6)
- Informing and educating Copernicus users (see KEPLER WPs 2 and 6)
- Engaging Copernicus users in public and private sector (see KEPLER WPs 1 and 6)
- Enabling access to Copernicus data and information (see KEPLER WPs 4, 5 and 6)

These well-tailored themes form the core components of KEPLER. However, as the Polar Regions are changing, so too are the challenges and opportunities. Because of these shifts we have included two additional themes that encompass the evolving needs. These are needed to provide opportunities for better understanding the environment, research opportunities, establishing new industry sectors and start-ups, and importantly empowering citizens

- Identification of research gaps regarding integration/assimilation
- Improved sea-ice mapping and forecasting.

Through these 6 themes KEPLER aims to release the full potential of Polar Regions Earth Observation, including from ESA and EUMETSAT, by identifying and eliminating the barriers that impede the use of the tremendous resource that is Copernicus. This combines 2 key elements of the call:

- a) Bringing together key European stakeholders and competent entities
- b) Growing the Copernicus brand and user-base through providing enhanced scientific and technical support.

Our objective with KEPLER is to provide a mechanism that enables the broad range of Polar Regions stakeholders to be equipped with the most accurate and relevant environmental information so that they can seize the many benefits that Copernicus products generate for society and economy.

Core to KEPLER are the Polar Regions stakeholders in the Copernicus programme. All activities in KEPLER are driven by the requirements of these stakeholders, and the work packages can be envisioned as a series of orbits around these:

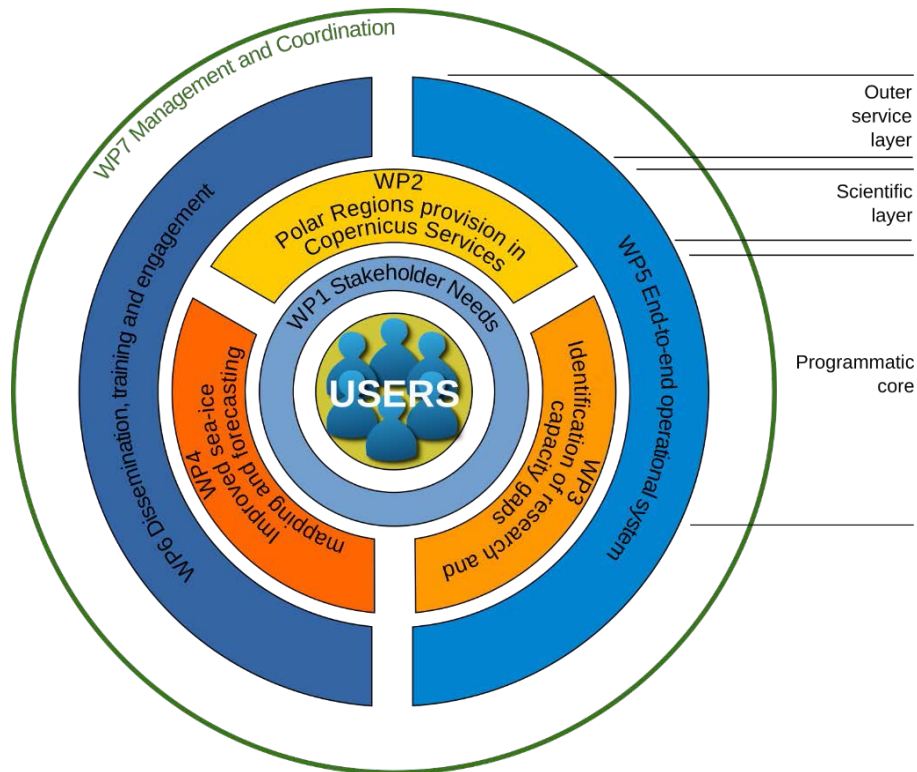


Figure 1. Schematic representation of the KEPLER capacity building shell: a programmatic core, a science layer, a service element layer.

## Work Packages

The project is structured around 7 complementary, interlinked, interdisciplinary, Work Packages (WPs). These are:

- \* **WP1:** Stakeholder needs and network coordination,
- \* **WP2:** Polar Regions provision in Copernicus Services,
- \* **WP3:** Identification of research and capacity gaps,
- \* **WP4:** Improved sea-ice mapping and forecasting,
- \* **WP5:** End-to-end operational system,
- \* **WP6:** Dissemination, training and engagement, and
- \* **WP7:** Management and coordination.



## Programme Office

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Co-ordinator:

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## KEPLER Work Package Leadership

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<b>WP1</b>	Leader	Penny	Wagner	<a href="mailto:penelopew@met.no">penelopew@met.no</a>
<b>WP2</b>	Leader	Gilles	Garric	<a href="mailto:gilles.garric@mercator-ocean.fr">gilles.garric@mercator-ocean.fr</a>
<b>WP3</b>	Leader	Carolina	Gabarro	<a href="mailto:cgabarro@icm.csic.es">cgabarro@icm.csic.es</a>
<b>WP4</b>	Leader	Steffen	Tietsche	<a href="mailto:steffen.tietsche@ecmwf.int">steffen.tietsche@ecmwf.int</a>
<b>WP5</b>	Leader	Frank	Kauker	<a href="mailto:frank@oasys-research.com">frank@oasys-research.com</a>
<b>WP6</b>	Leader	Nick	Hughes	<a href="mailto:nick.hughes@met.no">nick.hughes@met.no</a>
<b>WP7</b>	Leader	Elaina	Ford	<a href="mailto:eakf@bas.ac.uk">eakf@bas.ac.uk</a>

## KEPLER Management Board (KMB)

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1	Nick Hughes	MET No	Coordinator & WP 6 Leader
2	Elaina Ford	UKRI-BAS	Programme Manager & WP7 Leader
3	Per Helmer Skaali	MET NO	Finance manager
4	Emma Armitage	UKRI-BAS	Programme Administrator
5	Penny Wagner	MET No	WP1 Leader
6	Gilles Garric	MERCATOR	WP2 Leader
7	Carolina Gabarro	ICM-CSIC	WP3 Leader
8	Steffen Tietsche	ECMWF	WP4 Leader
9	Frank Kauker	O.A.SYS	WP5 Leader

## Advisory Board

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Name	Institute
Bent Ove Jamtli	ARCSAR / JRCC NN
Peter Pulsifer	GEOCRI
Janne Valkonen	DNV-GL
Stein Sandven	INTAROS / NERSC
Richard Hall	EQUINOR
Mark Drinkwater	ESA / PSTG
Shridhar Jawak	APECS / SIOS
Jan Saijets	Saami Council



## Communications

### Website

[www.kepler-polar.eu](http://www.kepler-polar.eu)

### Social Networking

Twitter:  [@KeplerEU](https://twitter.com/KeplerEU)



Follow us on Facebook: <https://www.facebook.com/KeplerEU>

### Mailing lists

To be added to the KEPLER mailing list for newsletters and project updates:

[https://mailchi.mp/28f578111bb2/kepler\\_eu](https://mailchi.mp/28f578111bb2/kepler_eu)

The following emailing groups exist for KEPLER. To be added please email: [Nick Hughes](#)

<a href="mailto:kepler@met.no">kepler@met.no</a>	Nick, Elaina, and Emma – general enquiries if you don't know who to send to.
<a href="mailto:kepler-all@met.no">kepler-all@met.no</a>	Everyone in the project, only members can send to it.
<a href="mailto:kepler-board@met.no">kepler-board@met.no</a>	Project management, only members can send to it.
<a href="mailto:kepler-pab@met.no">kepler-pab@met.no</a>	Project advisory board, only members can send to it.
<a href="mailto:kepler-stakeholders@met.no">kepler-stakeholders@met.no</a>	Stakeholder mailing list.

## Task List

<b>WP1 Stakeholder Needs and Network Coordination</b>	<b>Penelope Wagner</b>
T1.1 Maritime and Research Sector Needs	Penelope Wagner
T1.2 Community-based Observing and Societal Needs	Tero Mustonen
T1.3 Climate and Weather Forecasting Needs	Helge Goessling
T1.4: Overall assessment of stakeholder needs	Penelope Wagner
<b>WP2 - Polar Regions provision in Copernicus Services</b>	<b>Gilles Garric</b>
T2.1 Copernicus Land Monitoring Service (CLMS)	Marko Scholze
T2.2 Copernicus Marine Environment Monitoring Service (CMEMS).	Gilles Garric
<b>WP3 - Identification of research and capacity gaps</b>	<b>Carolina Gabarró</b>
T3.1 In situ observing systems.	Jeremy Wilkinson
T3.2 New and novel in-situ and airborne observation sensors and techniques.	Nick Hughes
T3.3 Space-based capability.	Carolina Gabarro



T3.4 Integration and assimilation through Quantitative Network Design (QND).	Thomas Kaminski
<b>WP4 - Improved sea-ice mapping and forecasting</b>	<b>Steffen Tietsche</b>
T4.1 Sea-ice mapping for maritime purposes.	Antti Kangas
T4.2 Monitoring sea-ice as an essential climate variable (ECV).	Thomas Lavergne
T4.3 Assess the scope for sea-ice forecast products.	Steffen Tietsche
<b>WP5 - End-to-end operational system</b>	<b>Frank Kauker</b>
T5.1 Synthesis on the visions of the evolution of the Copernicus services.	Laurent Bertino
T5.2 End-to-end operational system roadmap.	Frank Kauker
<b>WP6 - Dissemination, training and engagement</b>	<b>Nick Hughes</b>
T6.1 Establish an integrated communication plan.	Elaina Ford
T6.2 Communication tools	Elaina Ford
T6.3 Dissemination and exploitation	Nick Hughes
T6.4 Training	Cécile Thomas-Courcoux
T6.5 Best practice guide for research vessels and stations.	Jeremy Wilkinson
<b>WP7 - Management and coordination</b>	<b>Elaina Ford</b>
T7.1 Project set-up and resources	Elaina Ford
T7.2 Project Reporting	Elaina Ford
T7.3 Financial Management	Per Helmer Skaali
T7.4 Programme Meeting Coordination	Elaina Ford

## Deliverables and Milestones

Deliverables and Milestones are the tool the EC use to tell if we're holding up to our end of the contract. They are listed, along with descriptions of the Tasks, in the DoA. This **IS A CONTRACT** and therefore all work needs to be completed, to sufficient standard and on time, as per the DoA.

The month the EC expects to receive the report on the deliverable and milestone is listed in project months – the number of months since the start of the project. See back pages for a listing.

**Deadlines are not moveable – they are fixed deadlines of when the work is due. They can only be changed through a formal Amendment to the Grant Agreement with the European Commission.**

The deliverable reports need to be checked for completeness by the Programme Office before we can submit it to the EC. The deliverables and milestones therefore need to be submitted to the Programme Office on the **last day of the month before they are due.**

WP leaders also need to review, and add descriptions on how the work fits in with the overall aims of the project. A template will be available on the Google Drive folder.



# Milestones

Delivery dates in blue text have been amended- August 2020

MS No.	Milestone	Means of verification	Delivery month	Internal Delivery date	Lead participant
<b>WP 1</b>					
<b>M1</b> (M1.1)	Develop online questionnaire to gather stakeholder needs	Template with standard presentation for Tasks 1.1, 1.3, 2.1, 2.2, 3.1 and 3.2 with task specific question sets. Questionnaire will be online and accessible via the project web page.	<b>2</b>	31/01/2019	<b>METNO</b> Penelope Wagner
<b>M2</b> (M1.2)	Draft report on needs, gaps and priorities of Arctic communities.	Document circulated to consortium.	<b>5</b>	30/04/2019	<b>SNOW</b> Tero Mustonen
<b>M3</b> (M1.3)	Draft report on weather and climate forecasting needs.	Document circulated to consortium.	<b>6</b>	31/05/2019	<b>AWI</b> Helge Goessling
<b>M4</b> (M1.4)	Initial draft of stakeholder needs report.	Report document draft distributed to contributing participants.	<b>8</b>	31/07/2019	<b>METNO</b> Penelope Wagner
<b>WP2</b>					
<b>M5</b> (M2.1)	Intermediate report on ways to improve the description of the changing Polar Regions in the CLMS.	Draft version circulated for discussion at Year 1 GA.	<b>12</b>	30/11/2019	<b>ULund</b> Marko Scholze
<b>M6</b> (M2.2)	Intermediate report on ways to improve the description of the changing Polar Regions in the CMEMS.	Draft version circulated for discussion at Year 1 GA.	<b>12</b>	30/11/2019	<b>MERCATOR</b> Gilles Garric
<b>WP3</b>					
<b>M7</b> (M3.1)	Draft report on research gaps of in-situ Arctic Monitoring.	Distributed to contribute to WP5.	<b>11</b>	31/10/2019	<b>UKRI-BAS</b> Jeremy Wilkinson
<b>M8</b> (M3.2)	Draft report on new observing technologies and techniques	Distributed to contributing participants following input from POAC'19 (E3) and WP3.3.	<b>8</b>	31/07/2019	<b>METNO</b> Nick Hughes
<b>M9</b> (M3.3)	Draft report on research gaps of space-based Arctic monitoring	Distributed to contribute to WP5.	<b>12</b>	30/11/2019	<b>ICM-CSIC</b> Carolina Gabarro
<b>M10</b> (M3.4)	Draft report on research gaps in terms of integration/assimilation of space-based and in situ observations to fill in order to improve Arctic monitoring and forecasting capabilities.	Distributed to contribute to WP5.	<b>12</b>	30/11/2019	<b>ILAB</b> Thomas Kaminski

MS No.	Milestone	Means of verification	Delivery month	Internal Delivery date	Lead participant
<b>WP4</b>					
<b>M11</b> (M4.1)	Assessment of current practices finished	Presentation at IICWG Data Committee Workshop?	<b>10</b>	30/09/2019	<b>FMI</b> <b>Antti Kangas</b>
<b>M12</b> (M4.2)	Consultation with sea-ice ECV producers and documentation of their needs.	Draft document with list of questions to put to ECV producers.	<b>10</b>	30/09/2019	<b>METNO</b> <b>Thomas Lavergne</b>
<b>M13</b> (M4.3)	First version of sea-ice forecasting roadmap to feed into WP5.	Draft set of requirements for sea ice forecasting based on survey data.	<b>12</b>	30/11/2019	<b>ECMWF</b> <b>Steffen Tietsche</b>
<b>WP5</b>					
<b>M14</b> (M5.1)	First draft of report on ways to improve the description of the changing Polar Regions in marine Copernicus Services capability.	Draft report distributed to contributing participants by task leader.	<b>12</b>	30/11/2019 Revised 31/12/2020	<b>NERSC</b> <b>Laurent Bertino</b>
<b>M15</b> (M5.2)	Successful meeting of all participants for discussion of the input received from WPs 1-4 and the assignment of writing responsibilities for D5.2.	Meeting Minutes by WP leader.	<b>14</b>	31/01/2020	<b>O.A.SYS</b> <b>Frank Kauker</b>
<b>M16</b> (M5.3)	Successful meeting of all participants Plus invited external experts on the critical analysis of the draft of the roadmap.	Meeting Minutes by WP leader.	<b>28</b>	31/03/2021	<b>O.A.SYS</b> <b>Frank Kauker</b>
<b>NEW</b> <b>M27</b> (M5.4)	Key draft outputs for D5.2 Roadmap for end-to-end operational system for monitoring and forecasting the Arctic - presentation	Presentation for stakeholders- Includes draft/summary of D5.2, to feed to Copernicus and EU.	<b>23</b>	31/10/2020	<b>O.A.SYS</b> <b>Frank Kauker</b>

MS No.	Milestone	Means of verification	Delivery month	Internal Delivery date	Lead participant
<b>WP6</b>					
<b>M17</b> (M6.1)	Round table 1 on operational ice mapping services needs from Copernicus (IICWG 2019).	Meeting minutes by organiser.	<b>11</b>	31/10/2019	<b>METNO</b> Penelope Wagner
<b>M18</b> (M6.2)	Round table 2 on weather and climate forecasting needs	Meeting minutes by organiser.	<b>9</b>	31/08/2019	<b>AWI</b> Helge Goessling
<b>M19</b> (M6.3)	Round table 3 on CLMS needs (linked to Arctic Frontiers 2020)	Meeting minutes by organiser. Theme for Arctic Frontiers 2020 is yet to be announced, so topic remains TBC (To Be Confirmed).	<b>14</b>	31/01/2020	<b>ULund</b> Marko Scholze
<b>M20</b> (M6.4)	Round table 4 with the observational research community on research and capacity gaps	Meeting minutes by organiser.	<b>10</b>	30/09/2019	<b>UKRI-BAS</b> Jeremy Wilkinson
<b>M21</b> (M6.5)	Round table 5 on engineering and researcher information requirements (IAHR 2020)	Meeting minutes by organiser. IAHR is the International Association for Hydro-Environment Engineering and Research. The 25th IAHR International Symposium on Ice will be 14-18 June 2020 at NTNU, Trondheim, Norway.	<b>30</b>	31/05/2021	<b>METNO</b> Nick Hughes
<b>M22</b> (M6.6)	Workshop 1 on maritime and research sector needs	Report on workshop.	<b>29</b>	30/04/2021	<b>METNO</b> Nick Hughes
<b>M23</b> (M6.7)	Workshop 2 for local and indigenous community feedback and training, Inari, Finland	Report on workshop.	<b>6</b>	31/05/2019	<b>SNOW</b> Tero Mustonen
<b>M24</b> (M6.8)	Workshop 3 on in situ observing systems at 5th Arctic Observing Summit, Akureyri, Iceland	Report on workshop.	<b>29</b>	30/04/2021	<b>UKRI-BAS</b> Jeremy Wilkinson
<b>M25</b> (M6.9)	Workshop 4 at ESA Cryospheric Remote Sensing Summer School	Report on KEPLER activity in relation to the workshop.	<b>24</b>	31/12/2020	<b>MERCATOR</b> Gilles Garric
<b>M26</b> (M6.10)	Draft best practice guide for EO information use by research vessels and stations.	Draft report for discussion at Year 1 GA.	<b>12</b>	30/11/2019	<b>UKRI-BAS</b> Jeremy Wilkinson

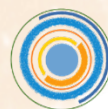
# Deliverables

Delivery dates in blue text have been amended- August 2020

Del. No.	Deliverable	Dissemination level	Delivery month	Internal Delivery date	Lead participant
<b>WP 1</b>					
<b>D1.1</b>	<b>Maritime and research sector needs.</b> Assessment of industry and research stakeholder views on existing products and needs for future enhancements.	CO	6	31/05/2019	METNO Penelope Wagner
<b>D1.2</b>	<b>Community-based observing and societal needs.</b> Assessment of existing products and needs for future enhancements based on consultations with stakeholders.	CO	6	31/05/2019	SNOW Tero Mustonen
<b>D1.3</b>	<b>Climate and weather forecasting needs.</b> Assessment of existing products and needs for future enhancements based on consultations with stakeholders.	CO	9	31/08/2019	AWI Helge Goessling
<b>D1.4</b>	<b>Stakeholder requirements synthesis.</b> Based on inputs from T1.1, T1.2 and T1.3, including needs in relation to existing and planned Copernicus capability, and future recommendations.	PU	23	04/11/2020	METNO Penelope Wagner
<b>WP2</b>					
<b>D2.1</b>	<b>CLMS improvements.</b> Final report on ways to improve the description of the changing Polar Regions in the Copernicus Land Monitoring Service (CLMS)	PU	15	29/02/2020	ULund Marko Scholze
<b>D2.2</b>	<b>CMEMS improvements.</b> Final report on ways to improve the description of the changing Polar Regions in the Copernicus Marine Environment Monitoring Service (CMEMS).	PU	15	29/02/2020	MERCATOR Gilles Garric
<b>WP3</b>					
<b>D3.1a</b>	<b>*DRAFT* version In situ observation gaps.</b> Report on the gaps in terms of in situ observations in order to improve Polar Regions monitoring and forecasting capabilities.	EC	7	01/06/2019	UKRI-BAS Jeremy Wilkinson
<b>D3.1</b>	<b>In situ observation gaps.</b> Report on the gaps in terms of in situ observations in order to improve Polar Regions monitoring and forecasting capabilities.	CO	21	30/08/2020	UKRI-BAS Jeremy Wilkinson

Del. No.	Deliverable	Dissemination level	Delivery month	Internal Delivery date	Lead participant
<b>WP3- cont</b>					
D3.2	<b>New and novel observation sensors and techniques.</b> Report on new and novel in situ and airborne observation sensors and techniques.	CO	11	31/10/2019	METNO Nick Hughes
D3.3	<b>Gaps in terms of space-based capabilities.</b> Report on the identified research gaps in terms of space-based capabilities in order to improve the Polar Regions monitoring and forecasting.	CO	18	31/05/2020	ICM-CSIC Carolina Gabarro
D3.4	<b>Synthesis report on research and capacity gaps.</b> Final report on research gaps in terms of integration/assimilation of space-based and in situ observations to fill in order to improve Polar Regions monitoring and forecasting capabilities.	PU	20	31/07/2020	ILAB Thomas Kaminski
D3.5	<b>WP3 executive summary</b>	PU	26	31/01/2021 -pending	ICM-CSIC Carolina Gabarro
<b>WP4</b>					
D4.1	<b>Harmonisation and improvement of sea ice mapping products.</b> Recommendations for international harmonisation and improved sea ice mapping	PU	18	31/05/2020	FMI Antti Kangas
D4.2	<b>Recommendations for improved sea ice ECV records.</b> Recommendations for improved sea ice Essential Climate Variable (ECV) records.	PU	22	30/09/2020	MET NO Thomas Lavergne
D4.3	<b>Recommendations for more user-relevant sea-ice forecasts.</b> Recommendations for more user- relevant sea-ice forecasts	PU	20	31/07/2020	ECMWF Steffen Tietsche
<b>WP5</b>					
D5.1a	<b>*DRAFT* version Synthesis on the visions of the evolution of the Copernicus services.</b> Report on ways to improve the description of the changing Polar Regions in all existing and planned marine Copernicus Services capability.	EC	7	01/06/2019	NERSC Laurent Bertino
D5.1	<b>Synthesis on the visions of the evolution of the Copernicus services.</b> Report on ways to improve the description of the changing Polar Regions in all existing and planned marine Copernicus Services capability.	PU	23 14/11	04/11/2020	NERSC Laurent Bertino
D5.2	<b>Roadmap for end-to-end operational system for monitoring the Arctic.</b> Roadmap for end-to-end operational system for monitoring the Arctic.	PU	28	31/03/2021	O.A.Sys Frank Kauker

WP6					
D6.1	<b>Communications plan.</b> Describes the coordinated communication strategy that facilitates meaningful dialogue between KEPLER participants and relevant target actors.	CO	3	28/02/2019	UKRI-BAS Elaina Ford
D6.2	<b>Project website and social media accounts.</b> Creation of project website and social media accounts.	PU	3	28/02/2019	UKRI-BAS Elaina Ford
Del. No.	Deliverable	Dissemination level	Delivery month	Internal Delivery date	Lead participant
WP6- cont					
D6.3	<b>Dissemination and exploitation plan.</b> Covers plans for dissemination and exploitation during the project.	CO	3	28/02/2019	METNO Nick Hughes
D6.4	<b>Dissemination and exploitation.</b> Report on dissemination and exploitation activity during the KEPLER project.	PU	30	31/05/2021	METNO Nick Hughes
D6.5	<b>Training materials and results.</b> Training tutorials and results of survey with statistics on training events attendance.	PU	30	31/05/2021	MERCATOR Cécile Thomas-Courcoux
D6.6	<b>Best practice guide for EO information use.</b> Best practice guide for Earth Observation information use by research vessels and stations.	PU	15	29/02/2020	UKRI-BAS Jeremy Wilkinson
WP7					
D7.1	<b>Project handbook.</b> The KEPLER Project Handbook will be issued at the outset of the project. This will include: a copy of the consortium agreement signed in advance of the project, EC grant agreement including technical annex, procedures, and all project templates.	CO	4	31/03/2019	UKRI-BAS Elaina Ford
D7.2	<b>Kick-off meeting report.</b> Report on kick-off meeting presentations and discussions.	CO	4	31/03/2019	UKRI-BAS Elaina Ford
D7.3	<b>End of first year meeting report.</b> Report on presentations and discussions at the project General Assembly at the end of Year 1.	CO	14	31/01/2020	UKRI-BAS Elaina Ford
D7.4	<b>Report on end of project meeting.</b> Report on the final project meeting regarding presentations and discussions.	CO	30	31/05/2021	UKRI-BAS Elaina Ford



## Deliverables and Milestones Yearly Plan – 2019

	Feb (2)	Mar (3)	Apr (4)	May (5)	Jun (6)	Jul (7)	Aug (8)	Sep (9)	Oct (10)	Nov (11)	Dec (12)
WP1	M1 (M1.1)			M2 (M1.2)	D1.1 D1.2 M3 (M1.3)		M4 (M1.4)	D1.3			
WP2											M5 (M2.1) M6 (M2.2)
WP3						D3.1A	M8 (M3.2)			D3.2 M7 (M3.1)	M9 (M3.3) M10 (M3.4)
WP4									M11 (M4.1) M12 (M4.2)		M13 (M4.3)
WP5						D5.1A					
WP6		D6.1 D6.2 D6.3			M23 (M6.7)			M18 (M6.2)	M20 (M6.4)	M17 (M6.1)	M26 (6.10)
WP7			D7.1 D7.2								





## Deliverables and Milestones Yearly Plan – 2019/20 (date order)

Internal Del. Date	Del. No	Deliverable & Milestone name 2019/20	WPL
31/01/19	M1 (M1.1)	Develop online questionnaire to gather stakeholder needs	Penelope Wagner
28/02/19	D6.1	Communications plan	Elaina Ford
28/02/19	D6.2	Project website and social media accounts	Elaina Ford
28/02/19	D6.3	Dissemination and exploitation plan	Nick Hughes
31/03/19	D7.1	Project handbook	Elaina Ford
31/03/19	D7.2	Kick-off meeting report	Elaina Ford
30/04/19	M2 (M1.2)	Draft report on needs, gaps and priorities of Arctic communities.	Tero Mustonen
31/05/19	D1.1	Maritime and research sector needs	Penelope Wagner
31/05/19	D1.2	Community-based observing and societal needs	Tero Mustonen
31/05/19	M3 (M1.3)	Draft report on weather and climate forecasting needs.	Helge Goessling
31/05/19	M23 (M6.7)	Workshop 2 for local and indigenous community feedback and training, Inari, Finland	Tero Mustonen
01/06/19	D3.1A	*DRAFT* version for EC Report In situ observation gaps.	Jeremy Wilkinson
01/06/19	D5.1A	*DRAFT* version for EC Report on synthesis on the visions of the evolution of the Copernicus services.	Laurent Bertino
31/07/19	M4 (M1.4)	Initial draft of stakeholder needs report.	Penelope Wagner
31/07/19	M8 (M3.2)	Draft report on new observing technologies and techniques	Nick Hughes
31/08/19	D1.3	Climate and weather forecasting needs	Helge Goessling
31/08/19	M18 (M6.2)	Round table 2 on weather and climate forecasting needs	Helge Goessling
30/09/19	M11 (M4.1)	Assessment of current practices finished	Antti Kangas
30/09/19	M12 (M4.2)	Consultation with sea-ice ECV producers and documentation of their needs.	Thomas Laverne
30/09/19	M20 (M6.4)	Round table 4 with the observational research community on research and capacity gaps	Jeremy Wilkinson
31/10/19	D3.2	New and novel observation sensors and techniques	Nick Hughes
31/10/19	M7 (M3.1)	Draft report on research gaps of in-situ Arctic Monitoring.	Jeremy Wilkinson
31/10/19	M17 (M6.1)	Round table 1 on operational ice mapping services needs from Copernicus (IICWG 2019).	Penelope Wagner
30/11/19	M5 (M2.1)	Intermediate report on ways to improve the description of the changing Polar Regions in the CLMS.	Marko Scholze
30/11/19	M6 (M2.2)	Intermediate report on ways to improve the description of the changing Polar Regions in the CMEMS.	Gilles Garric
30/11/19	M9 (M3.3)	Draft report on research gaps of space-based Arctic	Carolina Gabarro
30/11/19	M10 (M3.4)	Draft report on research gaps in terms of integration/assimilation of space-based and in situ observations to fill in order to improve Arctic monitoring and forecasting capabilities.	Thomas Kaminski
30/11/19	M13 (M4.3)	First version of sea-ice forecasting roadmap to feed into WP5.	Steffen Tietsche

## Deliverables and Milestones Yearly Plan – 2019/20 (date order)

Internal Del. Date	Del. No	Deliverable & Milestone name 2019/20	WPL
30/11/19	M26 (M6.10)	Draft best practice guide for EO information use by research vessels and stations.	Jeremy Wilkinson



## Deliverables and Milestones Yearly Plan - 2020-2021

	2020												2021					
	Jan (13)	Feb (14)	Mar (15)	Apr (16)	May (17)	Jun (18)	Jul (19)	Aug (20)	Sep (21)	Oct (22)	Nov (23)	Dec (24)	Jan (25)	Feb (26)	Mar (27)	Apr (28)	May (29)	June (30)
WP 1											D1.4							
WP 2			D2.1 D2.2															
WP 3						D3.3		D3.4	D3.1					D3.5				
WP 4						D4.1		D4.3		D4.2								
WP 5		M14 (M5.1)  M15 (M5.2)									D5.1 M27 (M5.4)					D5.2 M16 (M5.3)		
WP 6		M19 (M6.3)	D6.6										M25 (M6.9)				M22 (M6.6)  M24 (M6.8)	D6.4 D6.5 M21 (M6.5)
WP 7		D7.3																D7.4



## Deliverables and Milestones Yearly Plan - 2020-21 (date order)

Internal Del. Date	Del. No	Deliverable & Milestone name <u>2020/21</u>	WPL
31/01/20	D7.3	End of first year meeting report	Elaina Ford
31/01/20	M14 (M5.1)	First draft of report on ways to improve the description of the changing Polar Regions in marine Copernicus Services capability.	Laurent Bertino
31/01/20	M15 (M5.2)	Successful meeting of all participants for discussion of the input received from WPs 1-4 and the assignment of writing responsibilities for D5.2.	Frank Kauker
31/01/20	M19 (M6.3)	Round table 3 on CLMS needs (linked to Arctic Frontiers 2020)	Marko Scholze
29/02/20	D2.1	CLMS improvements	Marko Scholze
29/02/20	D2.2	CMEMS improvements	Gilles Garric
29/02/20	D6.6	Best practice guide for EO information use	Jeremy Wilkinson
31/05/20	D3.3	Gaps in terms of space-based capabilities	Carolina Gabarro
31/05/20	D4.1	Harmonisation and improvement of sea ice mapping products	Antti Kangas
31/07/20	D3.4	Synthesis report on research and capacity gaps	Thomas Kaminski
31/07/20	D4.3	Recommendations for more user-relevant sea-ice forecasts	Steffen Tietsche
31/08/20	D3.1	In situ observation gaps	Jeremy Wilkinson
30/09/20	D4.2	Recommendations for improved sea ice ECV records	Thomas Laverne
04/11/20	D1.4	Stakeholder requirements synthesis	Penelope Wagner
04/11/20	D5.1	Synthesis on the visions of the evolution of the Copernicus services	Laurent Bertino
31/12/20	M25 (M6.9)	Workshop 4 at ESA Cryospheric Remote Sensing Summer School	Gilles Garric
31/01/21	D3.5	WP3 executive summary	Carolina Gabarro
31/03/21	M16 (M5.3)	Successful meeting of all participants plus invited external	Frank Kauker
31/03/21	D5.2	Roadmap for end-to-end operational system for monitoring the	Frank Kauker
30/04/21	M22 (M6.6)	Workshop 1 on maritime and research sector needs	Nick Hughes
30/04/21	M24 (M6.8)	Workshop 3 on in situ observing systems at 5th Arctic	Jeremy
31/05/21	M21 (M6.5)	Round table 5 on engineering and researcher information	Nick Hughes
31/05/21	D6.4	Dissemination and exploitation	Nick Hughes
31/05/21	D6.5	Training materials and results	Cécile Thomas-Courcoux
31/05/21	D7.4	Report on end of project meeting	Elaina Ford

## KEPLER project timeline

2019												
Month	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Project Month	1	2	3	4	5	6	7	8	9	10	11	12

2020												
Month	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Project Month	13	14	15	16	17	18	19	20	21	22	23	24

2021						
Month	JAN	FEB	MAR	APR	MAY	JUN
Project Month	25	26	27	28	29	30

### Key dates

Year	Date	Activity
2019	Jan 1 <sup>st</sup>	Project Start
2019	Jan 28 <sup>th</sup> - 30 <sup>th</sup>	KEPLER Kick-Off Meeting
2019	Mar 25 <sup>th</sup> -26 <sup>th</sup>	EU-PolarNet General Assembly, Lisbon
2019	Apr 2-5 <sup>th</sup>	Arctic Shipping Forum, Helsinki
2019	May 13 <sup>th</sup> -17 <sup>th</sup>	ESA Living Planet
2019	May 13-15 <sup>th</sup>	WMO JCOMM-ETSI-7
2019	June 17 <sup>th</sup> -19 <sup>th</sup>	IICWG-DA Workshop, Bremen
2019	Sept 16 <sup>th</sup> -20 <sup>th</sup>	Ocean Obs 2019
2019	Sept 23 <sup>th</sup> - 27 <sup>th</sup>	IICWG 20, Copenhagen, Denmark (M6.1/ M17)
2019	Nov 25 <sup>th</sup> - 28 <sup>th</sup>	KEPLER Mid Term Meeting, Barcelona
2020	January 26 <sup>th</sup> -30 <sup>th</sup>	Arctic Frontiers 2020 (M6.3/M19)
2020	Mar 31 <sup>st</sup>	Interim report submission
2020	Mar 31 <sup>st</sup> - Apr 2 <sup>nd</sup>	Arctic Observing Summit Workshop, Akureyri, Iceland.
2020	May 31 <sup>st</sup>	Project mid-term review
2020	23 <sup>rd</sup> - 25 <sup>th</sup> November	IAHR 2020 International Symposium on ice *moved online
2020	June 17 <sup>th</sup>	Mid Term Review Meeting
2020	October 26 <sup>th</sup> -30 <sup>th</sup>	EO 4 Polar Science Symposium
2020	TBC End of October	IICWG-DA (T5.2)
2020	November 23 <sup>rd</sup> - 25 <sup>th</sup>	IAHR International symposium on Ice 2020
2020	December 1-15 <sup>th</sup>	Copernicus Marine Workshop (M6.9/M25)
2021	February 1-4 <sup>th</sup>	Arctic Frontiers 2021- building bridges
2021	February 17-18 <sup>th</sup>	Early Career Workshop
2021	March 23 <sup>rd</sup> -26 <sup>th</sup>	ASSW 2021 Arctic Science Summit week (M6.8/ M24)
2021	March/May 21 tbc	Workshop 1 on maritime and research sector needs (M6.6/M22)
2021	June TBC	KEPLER Final Meeting 3

2021	Summer TBC	POAC 2021, Moscow (M6.5/M21)
2021	June 30 <sup>th</sup>	KEPLER End of Project
2021	August 27th	Form C submission
2021	August 27th	Submit Final Report, CFS, KEPLER EC Review
2021	Oct 14 <sup>th</sup> – 17th	Arctic Circle 2021 (after end of project)
2021	Nov 1 <sup>st</sup> - 12th	COP26 (after end of project)
2021	TBC	IAHR International symposium on Ice 2021 (after end of project)

Other meetings and workshops to be added in due course.

Link to the KEPLER google calendar:

<https://calendar.google.com/calendar?cid=MGx0MGQxOGhkZWZkb21rbDJvNjhwcW0wbXNAZ3JvdXAuY2FsZW5kYXIuZ29vZ2xlLmNvbQ>

## KEPLER reporting timeline

