

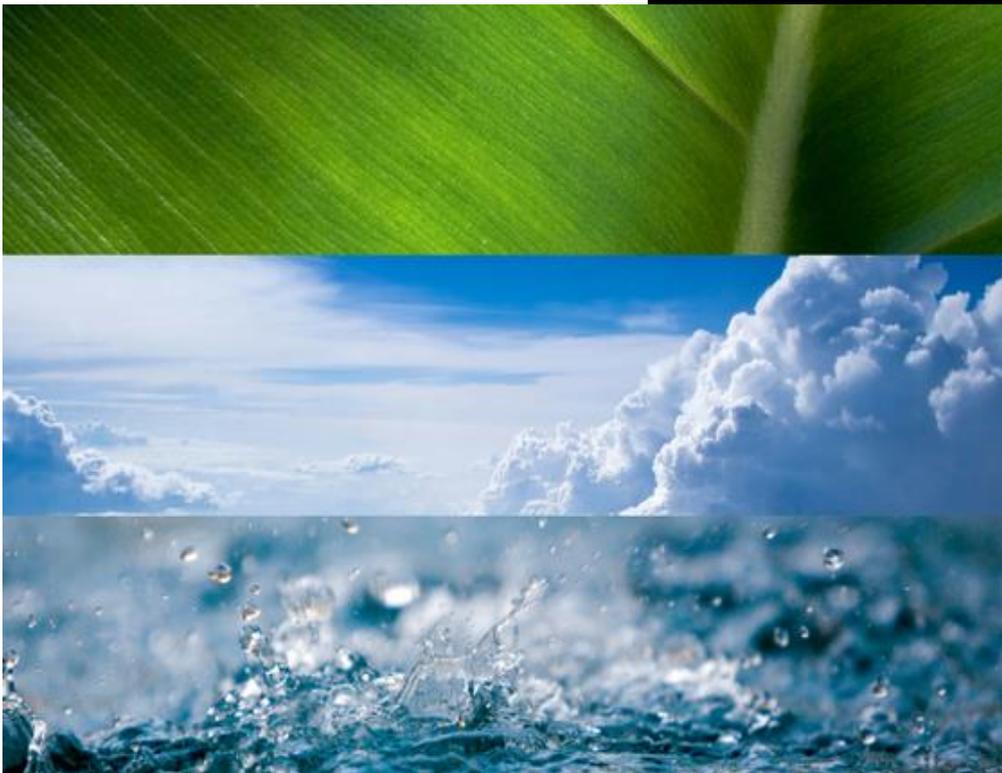


# RINGO | Readiness of ICOS

Readiness of ICOS for Necessities of integrated Global Observations

## Deliverable 6.13

# Final Risk Management Plan



RINGO (GA no 730944)

PUBLIC; R

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RINGO D6.13 Final Risk Management Plan

## Deliverable: Updated Risk Management Plan

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### Deliverable Review Checklist

A list of checkpoints has been created to be ticked off by the Task Leader before finalizing the deliverable. These checkpoints are incorporated into the deliverable template where the Task Leader must tick off the list.

- Appearance is generally appealing and according to the RINGO template. Cover page has been updated according to the Deliverable details. x
- The executive summary is provided giving a short and to the point description of the deliverable. x
- All abbreviations are explained in a separate list. x(n/a)
- All references are listed in a concise list. x(n/a)
- The deliverable clearly identifies all contributions from partners and justifies the resources used. x
- A full spell check has been executed and is completed. x

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Amendments, comments and suggestions should be sent to the authors

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## 1. INTRODUCTION

This Risk Management Plan describes the factors that have been recognised as posing a potential risk for the implementation of RINGO project activities. This plan also defines the estimated impact of the risks and the means of mitigating them, and addresses risks that are identified on Work Package level, describing the applied or proposed mitigation actions.

The structure of this report consists of a general overview on the risk management of the RINGO project as a whole, as well as a more detailed description of risk management on a work package and task level. This report evaluates the risk management process in RINGO and describes how the risk evaluation has been taking place during the project up to the month 36.

This plan is based on the wider ICOS Risk Management Plan, which is being developed as part of the goals of RINGO. Hence in this document describes risks in the RI operations even if their are outside of the scope of this project.

ICOS RI is a distributed infrastructure with quite a complicated governance and funding structure. Therefore, the risks related to the coordination of the ICOS RI operations and development are not non-existing. However, during the implementation phase, ICOS ERIC has successfully passed some critical points, such as concluding the negotiations of the ICOS ERIC-Central Facility agreements, agreement on the data license or possible funding shortages.

ICOS RI is in operational phase, with all the facilities in place. One critical point can be a withdrawal of one host institution or a Central Facility. ICOS RI has some experience on this, for example, in the implementation phase there has been delay in transferring some agreed on activities to the UK in Ocean Thematic Centre, and the Centre had to rescale its operations. This was done in a coordinated manner, and the main operations were maintained and goals reached.

Risks related to the operational distributed infrastructure may be related to e.g. sustainability of long term funding, lacking behind in scientific and technical development, losing the key personnel in research infrastructure or losing the user community of ICOS data.

The risk management plan of ICOS RI for the next five-year period identifies the risks specific to operational organisation, defines the mitigation, adaptation and contingency measures as well as actions to be taken. Monitoring the risks in all levels of ICOS RI is based on good communications between the different components of the RI and timely reporting of any problems.

The modular structure of ICOS RI makes it robust and adjustable, whether there is a need for alternative operational strategies due to realization of some risks. As an example, in case a Central Facility leaves the infrastructure, the obligations during the termination period are defined in ICOS ERIC- Central Facility agreement: new host institution will be searched, and care will be taken that the activities are transferred to the new host.

## 2. Identification of risks

### 2.1 Risk Management on the project level

The project risk management will be conducted in very close connection with the overall risk management of ICOS RI and will follow the same approach. This initial Risk Management Plan has been created during the first six months of the project implementation containing identification, classification (for probability and impact) and mitigation measures in consultation with the Work Package and Task Leaders. This plan describes any additional risks that have been recognised and evaluates the risk management during the first 36 months of the project. Risks are categorized using the scoring based on their probability of occurrence and impact. This is explained as top-down approach: starting from the impact on the overall project, deliverable and/or task. Mitigating actions will be tailored to limit the likelihood of the risks to occur and aimed to minimize the impact. Risk Management Plan will be monitored continuously throughout the project by Work Package and Task Leaders. Risk Management Plan will be updated twice a year in terms of risks identified and impact/likelihood and presented half-yearly to EB and yearly to General Assembly.

In table 1, the most common risks affecting the overall project implementation are identified and mitigation measures proposed. As stated above, more elaborated and detailed task and deliverable-level Risk Management Plan is developed in cooperation with the Beneficiaries and linked 3rd Parties during the duration of the project. Work Package and Task Leaders will be responsible on the day to day monitoring of the Risk Plan.

<b>Description of risk</b>	<b>Work package(s) involved</b>	<b>Probability, Impact</b>	<b>Proposed risk-mitigation measures</b>
Project Manager or WP Leader changes	WP 1, WP 2, WP 3, WP 4, WP 5, WP 6	Probability: medium Impact: medium	Sufficient project documentation in place. Assigning deputies and sharing responsibilities on critical deliverables.
Change of beneficiary (-ies) in the contracting phase	WP 1, WP 2, WP 3, WP 4, WP 5	Probability: medium, Impact: high	Reallocation of resources and ensuring sufficient competence of the consortium is maintained.
Change of beneficiary (ies) in the implementation phase	WP 1, WP 2, WP 3, WP 4, WP 5	Probability: low Impact: high	Sufficient project documentation in place. Reallocation of resources and ensuring sufficient competence of the consortium is maintained.
Work load significantly different than estimated in the proposal	WP 1, WP 2, WP 3, WP 4, WP 5	Probability: low Impact: medium	Realistic estimation and re-planning of the deliverables. Re-allocation of resources. Negotiation with Contracting Authority to solve long-term issues.
Significant failure to access to technology	WP 1, WP 3, WP 4,	Probability: low Impact: high	Notifying the Contracting Authority. Innovative and novel solutions sought by engaging SMEs or research agencies.

required for a work package or deliverable.			
Lack of maturity for tools, technology planned for an execution of a deliverable	WP 1, WP 3, WP 4, WP 5	Probability: medium Impact: medium	Notifying the Contracting Authority. Gathering resources from Scientific Community for novel solutions.
Lack of commitment from Linked 3rd Parties causing delays in deliverables	WP 1, WP 2, WP 3, WP 4, WP 5	Probability: low Impact: high	Sufficiently engaging and linked 3rd parties by continuous communications and visibility.
Lack of support from national bodies for achieving the goals	WP 1, WP 2, WP 3, WP 4, WP 5	Probability: low Impact: medium	Supporting national bodies by sufficient dissemination and information about the project benefits and impact. Lack of commitment is consistently persisting problem. This insecure/unsustainable funding situation of already established station recently actualized in UK, where the geographic coverage of ICOS ocean observations decreased significantly because the UK-Caribbean line, had to stop its' operations and the measuring equipment was removed from the vessel due to lack of national funding. HO & TC can provide support letters and actively enhance individual scientists and national institutions to seek external funding.
A beneficiary has significant delay or failure to assign qualified personnel for a task or a deliverable.	WP 1, WP 2, WP 3, WP 4, WP 5	Probability: medium Impact: high	Risk reduction by ramp-up phase, supporting the recruitment by communicating about recruitment via national and European networks.
Failure to engage the significant stakeholders and interest groups	WP 1, WP 2, WP 3, WP 4, WP 5	Probability: medium Impact: medium	Identification and analysis of stakeholder and interest groups and planned targeted dissemination actions
Poor visibility of the impacts and benefits of the project	WP 1, WP 2, WP 3, WP 4, WP 5	Probability: low Impact: high	Pro-active, timely and planned communication actions throughout the duration of the project.
Failure to establish shared methodologies	WP 1, WP 2, WP 3, WP 4, WP 5	Probability: medium	Facilitated discussions and clear and achievable milestones and deliverables, engaging leadership

and protocols for cooperation between the participant bodies and groups.		Impact: medium	of WP's leaders. Building trust between project partners.
Innovative solutions and methodologies not sufficiently used in project.	WP 1, WP 2, WP 3, WP 4, WP 5	Probability: low Impact: medium	Encouraging change and development of novel ideas, ways of working and methodologies by all beneficiaries.

Table 1. Most common risks, probability, impact and mitigation measures

## 2.2 Risk Management on Work Package level

### 2.2.1 Work Package 1: Increasing the Impact of ICOS

**Task 1.1: Analysis of requirements and possible impact of developing ICOS as European pillar of a global in-situ system resulting from COP 21**

#### Risk Identification and Management:

Description of risk	Specify the other Tasks/WPs or Deliverables it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures and proposed preventive actions
<b>Occurrences that were recognised as possible risks between M1 and M18</b>				
Delays in procurement technicalities or delays in contract/work implementation related to subcontracting	Delay of Deliverable 1.1 (WP1)	Medium	Medium	Detailed re-planning of timelines, re-allocation of tasks, sufficient communication, allocation of more time for the procurement process already in the project planning phase
Delays due to the necessity and added value of monitoring the ESFRI dialogue related to measuring the	Delay of Deliverable 1.1 (WP1)	Medium	Medium	Re-planning of timelines to ensure more to-the-point content of the document

performance and impact of European RIs				
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## Task 1.2 Developing ICOS RI readiness to provide information on fossil fuel emissions

### Risk Identification and Management:

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures
no risks foreseen so far				

## Task 1.3: Developing the ICOS Flask sampling strategy

### Risk Identification and Management:

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures and proposed preventive actions
Problem in recruitment of new staff	Possible delay of deliverable D1.3 (WP1)	high	high	Thorough planning of the needed resources and allocation of sufficient time for the recruitment process

## Task 1.4: Developing ICOS RI readiness to provide information on ecosystem – river – stream – estuary – ocean carbon transport and GHG fluxes

### Risk Identification and Management:

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures and proposed preventive actions
Workshop not conducted	None	Low	Low	Ensure good communication across Task 1.4

**Task 1.5 Enhancing the bridge between ICOS RI and satellite observations**

**Risk Identification and Management:**

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures and proposed preventive actions
No risk foreseen so far				

**2.2.2 Work Package 2: Enhancing ICOS membership and sustainability**

**Task 2.1: Building partnership with countries**

**Risk Identification and Management:**

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures
<b>Occurrences that were recognised as possible risks between M1 and M18</b>				
Delays due to temporary shortage of resources (personnel)				Re-scheduling timetables to accommodate the work needed

**Task 2.2: Support in building national network and training for managers in stakeholder liaison and resource acquisition**

**Risk Identification and Management:**

<b>Description of risk</b>	<b>Specify the other Tasks/WPs it affects (if any)</b>	<b>Probability (High, Medium, Low)</b>	<b>Impact (High, Medium, Low)</b>	<b>Risk Mitigation Measures and proposed preventive actions</b>
D2.3 – last moment cancellation due to illness or travel of the teachers (esteemed professionals and experts) (illness, travel problems)	WP2	Medium	Medium	Various teachers are invited. Once they have confirmed their participation, they are asked to provide names in case they would need a substitute. If skilled persons are not found, advanced professionals might be considered in case of need
D2.4 EMDESK not working	WP2	Low	Medium	In case of need the information and other materials would be shared by other on-line well-known tools (google docs, emails...). Special attention will be paid to ensuring compliance with the new GDPR regulations.

### Task 2.3: Training workshops for scientists in candidate countries

<b>Description of risk</b>	<b>Specify the other Tasks/WPs it affects (if any)</b>	<b>Probability (High, Medium, Low)</b>	<b>Impact (High, Medium, Low)</b>	<b>Risk Mitigation Measures</b>
D2.5 – last moment cancellation of the teachers, such as professors (illness, travel problems)	n/a	Medium	Medium	Once the teachers have confirmed their participation, they are asked to name potential substitutes in case of force majeure. This can be activated if known well in advance, where as if valid on site then professor could nominate a potential trainee (i.e. advance level Ph.D.- student to substitute.

### 2.2.3 Work Package 3: Technical developments

#### Task 3.1 Exploration to apply new technologies for vertical profiles

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures and proposed preventive actions
AirCore from a group not ready		Medium	Medium	Organize regular telecom, but cannot be often, otherwise partners would have no sufficient resources to participate
Bad weather during campaign		Medium	Medium	Try to plan the campaign a bit longer, more than one week, whenever possible without unbearable financial burden.

#### Task 3.2: Improving atmosphere measurements on voluntary observing ships

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures and proposed preventive actions
<b>Occurrences that were recognised as possible risks between M1 and M18</b>				
Delays in procurement technicalities	Possible delays in D3.2 (WP3)	Medium	Medium	Sufficient communication within the task Allocation for more time for the procurement processes in future
Delays in customs clearance for the Picarro instrument				Allocating more time for procurement processes
Delays in installation of Picarro on the VOS ship, contractual issues between the research	Possible delays in D3.2 (WP3)	Medium	Medium	Alternative installation plan (alternative timelines) drafted together with the original already in planning phase

institute and the vessel due to changes in vessel ownership				
VOS ship not available for Picarro installation and measurements	Possible delays in D3.2 (WP3)	Medium	Medium	Alternative VOS ship should be identified already in the planning phase; re-planning of measurement timelines, agreements with ships regarding installation already agreed on before the project starts. Yet, in case of sudden changes of mind due to i.e. change of shipowner is something that cannot be foreseen neither the changes in operating routes.

### Task 3.3: Moving towards an autonomous system to measure ocean surface carbon uptake in regions and seasons where merchant vessel- based systems are not suitable

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures
No risks foreseen so far				
<b>Unavailability of suitable autonomous vessel</b>	<b>None</b>	<b>Medium</b>	<b>High</b>	<b>Applying ship-time on other vessels, testing instrumentation on other platforms, building own vessel with separate funding</b>

### Task 3.4: Making non-CO2 - GHG eddy covariance measurements operational

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures
Unavailability of specific datasets		Low	Low	Other datasets will be used

### Task 3.5: Developing ICOS Ecosystem network to nodes for general Ecosystem observations

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures
Recruitment of junior scientist		low	high	Negotiation of INRA contract with coordinator
Data availability		medium	medium	Requests sent to multiple data sources.

## 2.2.4 Work Package 4: Improving data

### Task 4.1: Developing metadata for ICOS RI

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures and proposed preventive actions
No risks seen so far				

### Task 4.2: Making legacy data available

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures and proposed preventive actions
No risks seen so far				

## 2.2.5 Work Package 5: Towards a Global Carbon and GHG observation system

### Task 5.1: Building stable cooperation with other regional observational networks

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures and proposed preventive actions
No risks seen so far				


**Task 5.2: Developing ICOS Thematic Centers as stable operational pillars for domain-specific global networks**

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures and proposed preventive actions
No risks seen so far				

**2.2.6 Work Package 6: Project Management**

**Task 6.1 Project financial and administrative management**

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures and proposed preventive actions
Delays in submitting deliverables	WP1-6	Medium	High	Sufficient monitoring of WP progress with WP internal milestones and communicating foreseen delays effectively via the Participant Portal
Delays in processing payments e.g. due to lack of sufficient information from partners	WP1-6	Medium	High	Efficient internal communication
Delays in submitting information for reporting periods	WP1-6	Medium	High	Efficient communication and monitoring of progress, sufficient instructions to partners
<b>Occurrences that were recognised</b>				

<b>as possible risks between M1 and M18</b>				
Unclarity of H2020 rules and regulations related to Linked Third Parties among the consortium	WP 1 -6	Medium	High	Targeted frequent communication
Changes of WP leaders	WP 1-6	Medium	High	Ensure the cover is available. Yet, unforeseen changes of key personnel i.e. in the HO has actualized and it has hindered progress. So far, ICOS has been able to cover from it. There is no prevention as dedicatedly devoted personnel cannot be replaced from service providers offering temporary staff.

### Task 6.2 Project scientific and progress management

<b>Description of risk</b>	<b>Specify the other Tasks/WPs it affects (if any)</b>	<b>Probability (High, Medium, Low)</b>	<b>Impact (High, Medium, Low)</b>	<b>Risk Mitigation Measures and proposed preventive actions</b>
Lack of information received from partners		Medium	High	Establishing best practices to communicate with the consortium, follow timelines; evaluate information flows regularly
Technical challenges		High	High	Ensuring technical support is available

### Task 6.3 Project internal communications

<b>Description of risk</b>	<b>Specify the other Tasks/WPs it affects (if any)</b>	<b>Probability (High, Medium, Low)</b>	<b>Impact (High, Medium, Low)</b>	<b>Risk Mitigation Measures and proposed preventive actions</b>

Technical problems e.g. with EMDESK	WP1-6	Medium	Medium	Monitoring the functionalities and asking for feedback from consortium
Insufficient information about staff working on WPs	WP1-6	High	High	Repeatedly requesting updates for mailing lists. Special attention to be paid to ensuring compliance with the new GDPR regulations
Insufficient intervals in updating e.g. website or EMDESK	WP1-6	Low	Medium	Ensuring that the dissemination plan is implemented also on internal communication level

### Task 6.4 Organization of data management

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures
Lack of information regarding progress	WP6	Low	Medium	Frequent requests for updates

## 3. Risk Management Evaluation

During the project, ICOS RI has been strengthening its networks and internal cooperation; with several new officially labelled stations and concluded national network – ICOS ERIC contracts. Several internal dialogues have shown that mostly the ICOS RI members and stakeholders appear committed to ICOS, ensuring a reliable and continuous implementation of the work. These developments have made it less likely for the identified risks to materialise in the project, as the infrastructure has matured into a more established network.

During the project, some occurrences that were recognised as possible risks have occurred that have required re-scheduling of certain tasks and adjustments to Deliverable submission times. These are mainly related to WPs 1, 3, and 4 with certain Deliverables being postponed until the end of the second reporting period (end of 2019). Only few Deliverables needed to be postponed until the first months of 2020, and with the performed risk mitigation actions and new plans it is foreseen that there is high probability that these Deliverables will be completed by the new deadlines.

Some unexpected delays in work implementation due to temporary shortage of resources, prolonged procurement- and customs clearance processes and contractual issues, as well as general developments in the dialogue concerning the European RI landscape (e.g. the ESFRI working group related to measuring the performance of RIs) have contributed to some unforeseen delays and the necessity to postpone some scheduled work. These delays have, however, had a minor effect on the

overall progress of the project; they have caused a slight delay in two deliverables (D1.1 and D2.2) and a foreseen delay in D3.2, but it has been possible to re-schedule timetables to ensure as short a delay as possible. D2.2 was submitted one month late, and for D1.1 a new delivery timetable has been planned; deviating approximately 11 months from the originally planned timetable. It has been identified that especially related to subcontracting or procurement from overseas, additional risk evaluation is needed already in the project proposal writing phase; as timelines are often difficult to predict and technicalities and national regulations are likely to prolong the processes.

It has also been identified that to be able to ensure that all the results and developments of the project are fully promoted and disseminated and all achievements fully acknowledged, a more advanced communication culture needs to be developed within the consortium.

To ensure smooth running of the project, timely submission of deliverables and efficient reporting, an internal project handbook has been published and several internal processes have been implemented, including internal progress tracking, internal work planning and internal quality assurance procedure for deliverables (including a peer-review process). Detailed guidelines for reporting have been prepared and distributed among the consortium well in advance. It has been noted that additional attention to detail is required in clarifying the rights and obligations of Main Beneficiaries and Linked Third Parties is needed from the very beginning of the project. What is often proving out to be challenging is the fact that with multiple Main Beneficiaries and Linked Third Parties, some participants will start implementing the proposed work much later in the project than others and will need additional clarification of the H2020 rules and regulations. To improve on this, regular updates on the basic project information will be distributed prior to new participants commencing work on the project.