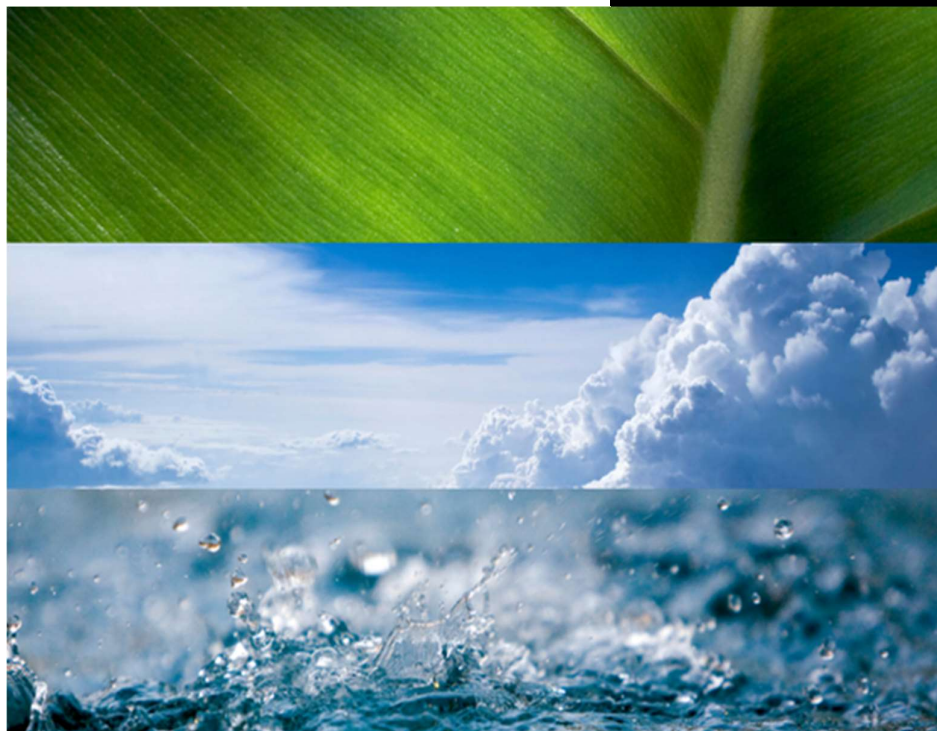




## Initial Risk Management Plan



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## Deliverable: Initial Risk Management Plan

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Amendments, comments and suggestions should be sent to the authors

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## 1. INTRODUCTION

This initial 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.

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 level.

This plan is based on the wider ICOS Risk Management Plan, which is being developed as part of the goals of RINGO.

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, yet very small. 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 the delay of UK to take over some agreed activities 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 actors 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.

The focus of the risk management process in RINGO will be the identification and management of true risks and their root causes. The aim will always be to lower the risk to manageable levels.

## 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. Risks are categorized using the scoring based on their probability of occurrence and 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 first month of implementation. Work Package and Task Leaders will be responsible on the day to day monitoring of the Risk Plan

Description of risk	Work package(s) involved	Probability, Impact	Proposed risk-mitigation measures
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 required for a work package or deliverable.	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.
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.

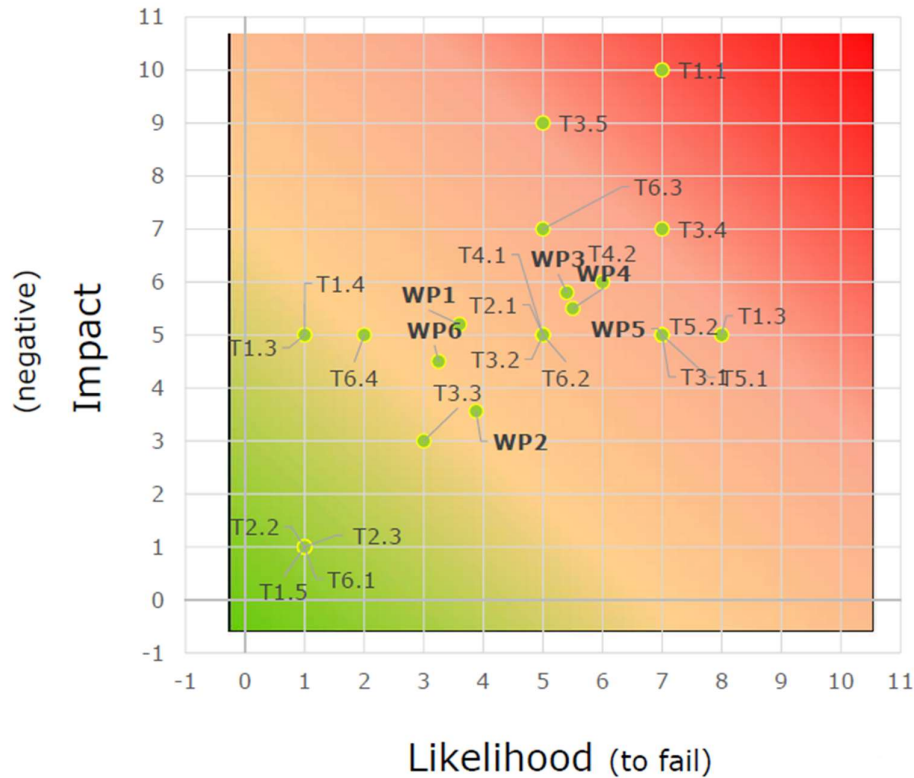
Lack of support from national bodies for achieving the goals	WP 1, WP 2, WP 3, WP 4, WP 5	Probability: low Impact: medium	Supporting national bodies by sufficient dissemination and information about the project benefits and impact.
A beneficiary has significant delay or failure to assign qualified personnel 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 and protocols for cooperation between the participant bodies and groups.	WP 1, WP 2, WP 3, WP 4, WP 5	Probability: medium Impact: medium	Facilitated discussions and clear and achievable milestones and deliverables, engaging leadership 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 and Task level – General Approach

A risk is the product of the probability of an event happening, and its consequences. The impact can be either positive or negative. However, in the context of RINGO and this document, we are essentially concerned with the possibility and treatment of negative events, so risk is defined as an uncertain future event that will prohibit the project from achieving its goals and objectives within cost, schedule and performance constraints.

The project coordination has discussed specific risks with the task leaders and tried to evaluate the overall risks of each task and work package. The approach is following the same approach as the overall project risks by categorizing the risks using the scoring based on their probability of occurrence and their impact. An initial scheme developed by A. Ibrom, DTU is shown in Fig. 1. The scheme will be used during the runtime of the project for continuous monitoring and to show the dynamics of risks by updating it regularly.



**Figure 1:** Initial risk assessment at Work Package and Task level. The graphical approach is following the idea of combining impact and likelihood and assigns highest risks to tasks with high impact and high likelihood.

Well organised and well executed risk management delivers the best results when performed against stable baselines. Therefore, the risk assessment has been designed in combination with a more detailed work plan for each task comprising additional milestones. The project management system EMDESK will be used to follow each task and through that generally minimize the risks of delay.

## 2.3 Detailed Risk Identification and Management at Work Package level

### 2.3.1 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**

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures
Unclear role definition of ICOS in the framework of future GHG observation system	All, general guidelines for further development of project will be missing.	medium	high	Preparatory discussions within ICOS, it's data users and potential service providers.
Core data for impact analysis missing.	All, general guidelines for further development of project will be missing.	medium	medium	Data for study prepared by task leader.
Strategy document (D1.1) delayed	All, general guidelines for further development of project will be missing.	medium	high	External impact analysis procured.

**Task 1.2 Developing ICOS RI readiness to provide information on fossil fuel emissions**

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**

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures
Problem in recruitment of new staff		high	high	Possible delay of deliverable D1.3

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

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures
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**

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



### 2.3.2 Work Package 2: Enhancing ICOS membership and sustainability

#### Task 2.1: Building partnership with countries

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 interest from new countries	WP2	Low	High	Negotiations are based on long-term existing relationships, these will be continuously maintained
No 'common language' is reached	WP2	Low	High/Medium	Increasing emphasis on scientific diplomacy

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

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures
D2.3 – last moment cancellation of the trainers (illness, traffic problems)	n/a	Medium	Medium	Various trainers are invited, substitute person are identified to be potentially contacted in case of need

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

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures
D2.5 – last moment cancellation of the trainers (illness, traffic problems)	n/a	Medium	Medium	Various trainers are invited, substitute person are identified to be potentially contacted in case of need

### 2.3.3 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
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

**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
Instrument purchase delayed		low	high	Procurement process started during ramping up of project

**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
Unexpected difficulties in R&D	WP3	Medium	Medium/High	Actively seeking alternative methods to succeed in critical steps

**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.

**2.3.4 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
Delays in communication from connected organisations or projects	WP4	High	Low	Active communication and specifying the topics where contribution is expected

**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
Workload higher than expected	WP4	Low/Medium	Low/Medium	Proper planning and allocation of resources

**2.3.5 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
Identification of respective partners fails	Task 1.1	medium	high	Identification already started. Close cooperation with RISCAPÉ project to map international RIs
Failure of ramping up GEO-C	Task 5.1, related Milestones and D5.3	Medium	High	Securing wide collaboration and commitments
Failure of getting wide support within ICOS RI	Task 5.1, related Milestones and D5.3	Medium	High	Involving all Central Facilities and key people in internal negotiations early on, actively seeking mutual understanding of the role of ICOS in GEO-C and IG <sup>3</sup> IS
Key people in ICOS/GEO-C/IG <sup>3</sup> IS change	Task 5.1, related Milestones and D5.3	Medium	Low	Securing wide collaboration and institutional commitments

**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
Identification of respective partners fails	Task 1.1	medium	high	Identification already started. Close cooperation with RISCAPÉ project to map international RIs
Other FLUXNET networks not participating	Task 5.2, related to D5.4	Medium/High	Medium	It will be difficult to get all the networks participating but this is also the reason why the activity is important. Involvement of largest network is already under discussion and this will hopefully help to involve also the others.
Difficulties to agree on standards	Task 5.2, related to D5.4	Low/Medium	Medium/High	We don't start from zero and reference to international standards (e.g. WMO) will be used. As backup plan, a correspondence system will be prepared in order to easily converge on common

				system from different sources.
Hiring process	Task 5.2, New staff has to be hired (UiB for D5.2)	Low/Medium	Medium/High	Position early announced and collaboration with US partners

### 2.3.6 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
Delays in submitting deliverables	WP1-6	Medium	High	Sufficient monitoring of WP progress with WP internal milestones
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

#### Task 6.2 Project scientific and progress 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 received from partners	WP1-6	High	Low/Medium	Actively maintaining communications networks and finding and establishing working communication methods
Technical challenges	WP1-6	Medium	Low	Exploring and utilizing multiple technologies when possible, following performance e.g. by routine tests
Contact persons change	WP1-6	High	Low	Introducing new people to the tasks and established methods

#### Task 6.3 Project internal communications

Description of risk	Specify the other Tasks/WPs it affects (if any)	Probability (High, Medium, Low)	Impact (High, Medium, Low)	Risk Mitigation Measures
D2.4 EMDESK not working	n/a	Low	Medium	EMDESK is robust tool with good users' reputation from other FPs projects. In case

				of need the information and other materials would be shared by other on-line well known tools (google docs, emails...).
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	Repeteadly requesting updates for mailing lists
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. CONCLUSIONS**

This initial risk management plan has defined the methodology and already identified the basic risks at overall project as well as work package and task level. Further description of the risks will be elaborated during the runtime of the project which will result in an update of the risk management plan and particularly in the individual risk assessment at task level.