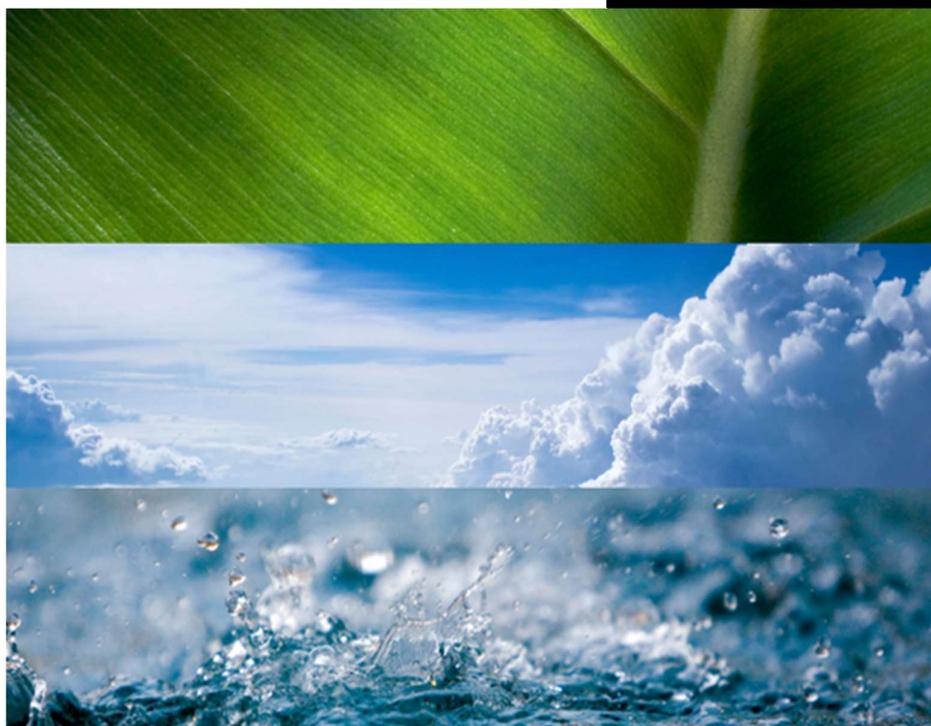




Initial Risk Management Plan



RINGO (GA no 730944)

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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.

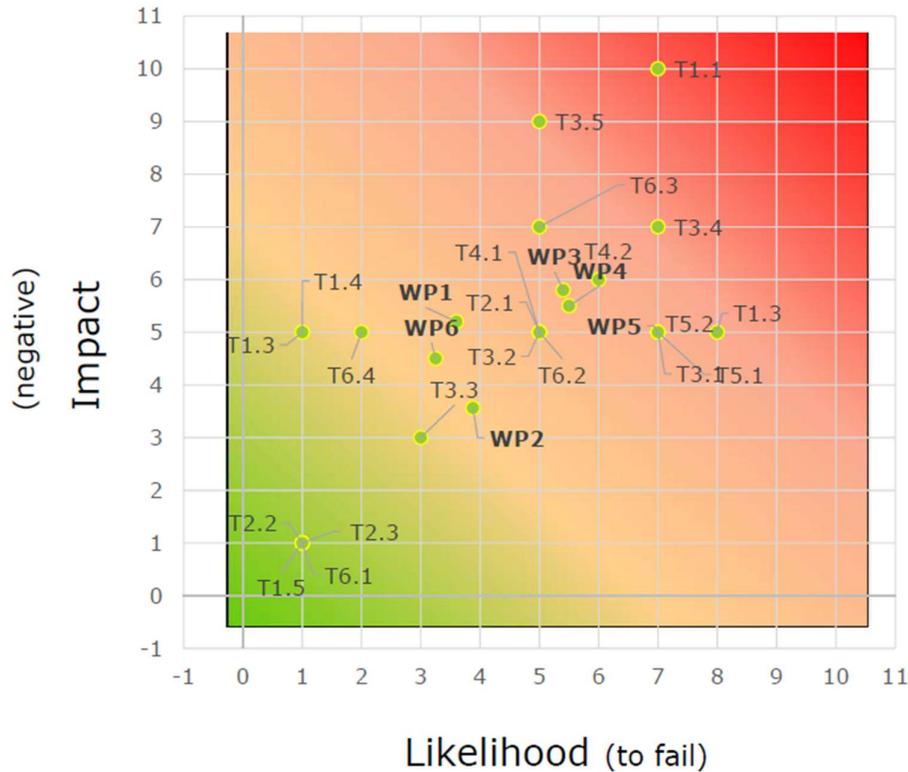


Figure 1: Initial risk assessment at Work Package and Task level. The graphical approach is following the idea of combining impact and likelihood and assigns highest risks to tasks with high impact and high likelihood.

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 ³ IS |
| Key people in ICOS/GEO-C/IG ³ 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.