INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI 2005–2010

RC-Specific Evaluation of FRESH – Freshwater Research

Seppo Saari & Antti Moilanen (Eds.)

Evaluation Panel: Biological, Agricultural and Veterinary Sciences
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Researcher Community (RC) was a new concept of the participating unit in the evaluation. Participation in the evaluation was voluntary and the RCs had to choose one of the five characteristic categories to participate. Evaluation of the Researcher Community was based on the answers to the evaluation questions. In addition a list of publications and other activities were provided by the TUHAT system. The CWTS/Leiden University conducted analyses for 80 RCs and the Helsinki University Library for 66 RCs. Panellists, 49 and two special experts in five panels evaluated all the evaluation material as a whole and discussed the feedback for RC-specific reports in the panel meetings in Helsinki. The main part of this report is consisted of the feedback which is published as such in the report.

Chapters in the report:
1. Background for the evaluation
2. Evaluation feedback for the Researcher Community
3. List of publications
4. List of activities
5. Bibliometric analyses

The level of the RCs’ success can be concluded from the written feedback together with the numeric evaluation of four evaluation questions and the category fitness. More conclusions of the success can be drawn based on the University-level report.

RC-specific information:

Main scientific field of research: Biological, Agricultural and Veterinary Sciences

RC-specific keywords: fresh water, limnology, biology, ecology, fisheries, management

Participation category:
3. Research of the participating community is distinct from mainstream research, and the special features of the research tradition in the field must be considered in the evaluation

RC’s responsible person:
Horppila, Jukka

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Research Evaluation, Meta-evaluation, Doctoral Training, Bibliometric Analyses, Researcher Community

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Foreword

The evaluation of research and doctoral training is being carried out in the years 2010–2012 and will end in 2012. The steering group appointed by the Rector in January 2010 set the conditions for participating in the evaluation and prepared the Terms of Reference to present the evaluation procedure and criteria. The publications and other scientific activities included in the evaluation covered the years 2005–2010.

The participating unit in the evaluation was defined as a Researcher Community (RC). To obtain a critical mass with university-level impact, the number of members was set to range from 20 to 120. The RCs were required to contain researchers in all stages of their research career, from doctoral students to principal investigators (Pis). All in all, 136 Researcher Communities participated in this voluntary evaluation, 5857 persons in total, of whom 1131 were principal investigators. PIs were allowed to participate in two communities in certain cases, and 72 of them used this opportunity and participated in two RCs.

This evaluation enabled researchers to define RCs from the “bottom up” and across disciplines. The aim of the evaluation was not to assess individual performance but a community with shared aims and researcher-training activities. The RCs were able to choose among five different categories that characterised the status and main aims of their research. The steering group considered the process of applying to participate in the evaluation to be important, which lead to the establishment of these categories. In addition, providing a service for the RCs to enable them to benchmark their research at the global level was a main goal of the evaluation.

The data for the evaluation consisted of the RCs’ answers to evaluation questions on supplied e-forms and a compilation extracted from the TUHAT – Research Information System (RIS) on 12 April 2011. The compilation covered scientific and other publications as well as certain areas of scientific activities. During the process, the RCs were asked to check the list of publications and other scientific activities and make corrections if needed. These TUHAT compilations are public and available on the evaluation project sites of each RC in the TUHAT-RIS.

In addition to the e-form and TUHAT compilation, University of Leiden (CWTS) carried out bibliometric analyses from the articles included in the Web of Science (WoS). This was done on University and RC levels. In cases where the publication forums of the RC were clearly not represented by the WoS data, the Library of the University of Helsinki conducted a separate analysis of the publications. This was done for 66 RCs representing the humanities and social sciences.

The evaluation office also carried out an enquiry targeted to the supervisors and PhD candidates about the organisation of doctoral studies at the University of Helsinki. This and other documents describing the University and the Finnish higher education system were provided to the panellists.

The panel feedback for each RC is unique and presented as an entity. The first collective evaluation reports available for the whole panel were prepared in July–August 2011. The reports were accessible to all panel members via the electronic evaluation platform in August. Scoring from 1 to 5 was used to complement written feedback in association with evaluation questions 1–4 (scientific focus and quality, doctoral training, societal impact, cooperation) and in addition to the category evaluating the fitness for participation in the evaluation. Panellists used the international level as a point of comparison in the evaluation. Scoring was not expected to go along with a preset deviation.

Each of the draft reports were discussed and dealt with by the panel in meetings in Helsinki (from 11 September to 13 September or from 18 September to 20 September 2011). In these meetings the panels also examined the deviations among the scores and finalised the draft reports together.

The current RC-specific report deals shortly with the background of the evaluation and the terms of participation. The main evaluation feedback is provided in the evaluation report, organised according to the evaluation questions. The original material provided by the RCs for the panellists has been attached to these documents.
On behalf of the evaluation steering group and office, I sincerely wish to thank you warmly for your participation in this evaluation. The effort you made in submitting the data to TUHAT-RIS is gratefully acknowledged by the University. We wish that you find this panel feedback useful in many ways. The bibliometric profiles may open a new view on your publication forums and provide a perspective for discussion on your choice of forums. We especially hope that this evaluation report will help you in setting the future goals of your research.

Johanna Björkroth
Vice-Rector
Chair of the Steering Group of the Evaluation

Steering Group of the evaluation
Steering group, nominated by the Rector of the University, was responsible for the planning of the evaluation and its implementation having altogether 22 meetings between February 2010 and March 2012.

Chair
Vice-Rector, professor Johanna Björkroth

Vice-Chair
Professor Marja Airaksinen
Chief Information Specialist, Dr Maria Forsman
Professor Arto Mustajoki
University Lecturer, Dr Kirsi Pyhältö
Director of Strategic Planning and Development, Dr Ossi Tuomi
Doctoral candidate, MSocSc Jussi Vauhkonen
Panel members

CHAIR
Professor Ary A. Hoffman
Ecological genetics, evolutionary biology, biodiversity conservation, zoology
University of Melbourne, Australia

VICE-CHAIR
Professor Barbara Koch
Forest Sciences, remote sensing
University of Freiburg, Germany

Professor Per-Anders Hansson
Agricultural engineering, modeling, life cycle analysis, bioenergy
Swedish University of Agricultural Sciences

Professor Danny Huylebroeck
Developmental biology
Katholieke Universiteit Leuven, Belgium

Professor Jonathan King
Virus assembly, protein folding
Massachusetts Institute of Technology MIT, USA

Professor Hannu J.T. Korhonen
Functional foods, dairy technology, milk hygiene
MTT Agrifood Research Finland

Professor Kristiina Kruus
Microbiological biotechnology, microbiological enzymes, applied microbiology
VTT Technical Research Centre of Finland

Professor Joakim Lundeberg
Biochemistry, biotechnology, sequencing, genomics
KTH Royal Institute of Technology, Sweden

Professor Dominiek Maes
Veterinary medicine
Ghent University, Belgium

Professor Olli Saastamoinen
Forest economics and policy
University of Eastern Finland

Professor Kai Simons
Biochemistry, molecular biology, cell biology
Max-Planck-Institute of Molecular Cell Biology and Genetics, Germany

The panel, independently, evaluated all the submitted material and was responsible for the feedback of the RC-specific reports. The panel members were asked to confirm whether they had any conflict of interests with the RCs. If this was the case, the panel members disqualified themselves in discussion and report writing.

Added expertise to the evaluation was contributed by the members from the other panels and by one evaluator outside the panels.
External Expert
Professor Anders Linde
Oral biochemistry
Faculty of Odontology
Göteborg University
Sweden

Experts from the Other Panels
Professor Caitlin Buck, from the Panel of Natural Sciences
Professor Ritske Huismans, from the Panel of Natural Sciences
Professor Johanna Ivaska, from the Panel of Medicine, biomedicine and health sciences
Professor Lea Kauppi, from the Panel of Natural Sciences
Professor Holger Stark, from the Panel of Natural Sciences
Professor Peter York, from the Panel of Medicine, biomedicine and health sciences

EVALUATION OFFICE
Dr Seppo Saari, Doc., Senior Adviser in Evaluation, was responsible for the entire evaluation, its planning and implementation and acted as an Editor-in-chief of the reports.
Dr Eeva Sievi, Doc., Adviser, was responsible for the registration and evaluation material compilations for the panellists. She worked in the evaluation office from August 2010 to July 2011.
MSocSc Paula Ranne, Planning Officer, was responsible for organising the panel meetings and all the other practical issues like agreements and fees and editing a part the RC-specific reports. She worked in the evaluation office from March 2011 to January 2012.
Mr Antti Moilanen, Project Secretary, was responsible for editing the reports. He worked in the evaluation office from January 2012 to April 2012.

TUHAT OFFICE
Provision of the publication and other scientific activity data
Mrs Aija Kaitera, Project Manager of TUHAT-RIS served the project ex officio providing the evaluation project with the updated information from TUHAT-RIS. The TUHAT office assisted in mapping the publications with CWTS/University of Leiden.
MA Liisa Ekebom, Assisting Officer, served in TUHAT-RIS updating the publications for the evaluation. She also assisted the UH/Library analyses.
BA Liisa Jäppinen, Assisting Officer, served in TUHAT-RIS updating the publications for the evaluation.

HELSDINK UNIVERSITY LIBRARY
Provision of the publication analyses
Dr Maria Forsman, Chief Information Specialist in the Helsinki University Library, managed with her 10 colleagues the bibliometric analyses in humanities, social sciences and in other fields of sciences where CWTS analyses were not applicable.
Acronyms and abbreviations applied in the report

External competitive funding
AF – Academy of Finland
TEKES – Finnish Funding Agency for Technology and Innovation
EU – European Union
ERC – European Research Council
International and national foundations
FP7/6 etc. /Framework Programmes/Funding of European Commission

Evaluation marks
Outstanding (5)
Excellent (4)
Very Good (3)
Good (2)
Sufficient (1)

Abbreviations of Bibliometric Indicators
P – Number of publications
TCS – Total number of citations
MCS – Number of citations per publication, excluding self-citations
PNC – Percentage of uncited publications
MNCS – Field-normalized number of citations per publication
MNJS – Field-normalized average journal impact
THCI10 – Field-normalized proportion highly cited publications (top 10%)
INT_COV – Internal coverage, the average amount of references covered by the WoS
WoS – Thomson Reuters Web of Science Databases

Participation category
Category 1. The research of the participating community represents the international cutting edge in its field.
Category 2. The research of the participating community is of high quality, but the community in its present composition has yet to achieve strong international recognition or a clear break-through.
Category 3. The research of the participating community is distinct from mainstream research, and the special features of the research tradition in the field must be considered in the evaluation.
Category 4. The research of the participating community represents an innovative opening.
Category 5. The research of the participating community has a highly significant societal impact.

Research focus areas of the University of Helsinki
Focus area 1: The basic structure, materials and natural resources of the physical world
Focus area 2: The basic structure of life
Focus area 3: The changing environment – clean water
Focus area 4: The thinking and learning human being
Focus area 5: Welfare and safety
Focus area 6: Clinical research
Focus area 7: Precise reasoning
Focus area 8: Language and culture
Focus area 9: Social justice
Focus area 10: Globalisation and social change
1 Introduction to the Evaluation

1.1 RC-specific evaluation reports

The participants in the evaluation of research and doctoral training were Researcher Communities (hereafter referred to as the RC). The RC refers to the group of researchers who registered together in the evaluation of their research and doctoral training. Preconditions in forming RCs were stated in the Guidelines for the Participating Researcher Communities. The RCs defined themselves whether their compositions should be considered well-established or new.

It is essential to emphasise that the evaluation combines both meta-evaluation\(^1\) and traditional research assessment exercise and its focus is both on the research outcomes and procedures associated with research and doctoral training. The approach to the evaluation is enhancement-led where self-evaluation constituted the main information. The answers to the evaluation questions formed together with the information of publications and other scientific activities an entity that was to be reviewed as a whole.

The present evaluation recognizes and justifies the diversity of research practices and publication traditions. Traditional Research Assessment Exercises do not necessarily value high quality research with low volumes or research distinct from mainstream research. It is challenging to expose the diversity of research to fair comparison. To understand the essence of different research practices and to do justice to their diversity was one of the main challenges of the present evaluation method. Understanding the divergent starting points of the RCs demanded sensitivity from the evaluators.

1.2 Aims and objectives in the evaluation

The aims of the evaluation are as follows:

- to improve the level of research and doctoral training at the University of Helsinki and to raise their international profile in accordance with the University's strategic policies. The improvement of doctoral training should be compared to the University's policy.\(^2\)
- to enhance the research conducted at the University by taking into account the diversity, originality, multidisciplinary nature, success and field-specificity,
- to recognize the conditions and prerequisites under which excellent, original and high-impact research is carried out,
- to offer the academic community the opportunity to receive topical and versatile international peer feedback,
- to better recognize the University’s research potential.
- to exploit the University's TUHAT research information system to enable transparency of publishing activities and in the production of reliable, comparable data.

1.3 Evaluation method

The evaluation can be considered as an enhancement-led evaluation. Instead of ranking, the main aim is to provide useful information for the enhancement of research and doctoral training of the participating RCs. The comparison should take into account each field of science and acknowledge their special character.

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1 The panellists did not read research reports or abstracts but instead, they evaluated answers to the evaluation questions, tables and compilations of publications, other scientific activities, bibliometrics or comparable analyses.

2 Policies on doctoral degrees and other postgraduate degrees at the University of Helsinki.
The comparison produced information about the present status and factors that have lead to success. Also challenges in the operations and outcomes were recognized.

The evaluation approach has been designed to recognize better the significance and specific nature of researcher communities and research areas in the multidisciplinary top-level university. Furthermore, one of the aims of the evaluation is to bring to light those evaluation aspects that differ from the prevalent ones. Thus the views of various fields of research can be described and research arising from various starting points understood better. The doctoral training is integrated into the evaluation as a natural component related to research. Operational processes of doctoral training are being examined in the evaluation.

**Five stages of the evaluation method were:**

1. Registration – Stage 1
2. Self-evaluation – Stage 2
3. TUHAT\(^3\) compilations on publications and other scientific activities\(^4\)
4. External evaluation
5. Public reporting

### 1.4 Implementation of the external evaluation

**Five Evaluation Panels**

Five evaluation panels consisted of independent, renowned and highly respected experts. The main domains of the panels are:

1. biological, agricultural and veterinary sciences  
2. medicine, biomedicine and health sciences  
3. natural sciences  
4. humanities  
5. social sciences

The University invited 10 renowned scientists to act as chairs or vice-chairs of the five panels based on the suggestions of faculties and independent institutes. Besides leading the work of the panel, an additional role of the chairs was to discuss with other panel chairs in order to adopt a broadly similar approach. The panel chairs and vice-chairs had a pre-meeting on 27 May 2011 in Amsterdam.

The panel compositions were nominated by the Rector of the University 27 April 2011. The participating RCs suggested the panel members. The total number of panel members was 50. The reason for a smaller number of panellists as compared to the previous evaluations was the character of the evaluation as a meta-evaluation. The panellists did not read research reports or abstracts but instead, they evaluated answers to the evaluation questions, tables and compilations of publications, other scientific activities, bibliometrics and comparable analyses.

The panel meetings were held in Helsinki:

- On 11–13 September 2011: (1) biological, agricultural and veterinary sciences, (2) medicine, biomedicine and health sciences and (3) natural sciences.
- On 18–20 September 2011: (4) humanities and (5) social sciences.

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\(^3\) TUHAT (acronym) of Research Information System (RIS) of the University of Helsinki  
\(^4\) Supervision of thesis, prizes and awards, editorial work and peer reviews, participation in committees, boards and networks and public appearances.
1.5 Evaluation material

The main material in the evaluation was the RCs’ self-evaluations that were qualitative in character and allowed the RCs to choose what was important to mention or emphasise and what was left unmentioned.

The present evaluation is exceptional at least in the Finnish context because it is based on both the evaluation documentation (self-evaluation questions, publications and other scientific activities) and the bibliometric reports. All documents were delivered to the panellists for examination.

Traditional bibliometrics can be reasonably done mainly in medicine, biosciences and natural sciences when using the Web of Science database, for example. Bibliometrics, provided by CWTS/The Centre for Science and Technology Studies, University of Leiden, cover only the publications that include WoS identification in the TUHAT-RIS.

Traditional bibliometrics are seldom relevant in humanities and social sciences because the international comparable databases do not store every type of high quality research publications, such as books and monographs and scientific journals in other languages than English. The Helsinki University Library has done analysis to the RCs, if their publications were not well represented in the Web of Science databases (RCs should have at least 50 publications and internal coverage of publications more than 40%) – it meant 58 RCs. The bibliometric material for the evaluation panels was available in June 2011. The RC-specific bibliometric reports are attached at the end of each report.

The panels were provided with the evaluation material and all other necessary background information, such as the basic information about the University of Helsinki and the Finnish higher education system.

Evaluation material

1. Registration documents of the RCs for the background information
2. Self evaluation material – answers to the evaluation questions
3. Publications and other scientific activities based on the TUHAT RIS:
   3.1. statistics of publications
   3.2. list of publications
   3.3. statistics of other scientific activities
   3.4. list of other scientific activities
4. Bibliometrics and comparable analyses:
   4.1. Analyses of publications based on the verification of TUHAT-RIS publications with the Web of Science publications (CWTS/University of Leiden)
   4.2. Publication statistics analysed by the Helsinki University Library - mainly for humanities and social sciences
5. University level survey on doctoral training (August 2011)
6. University level analysis on publications 2005–2010 (August 2011) provided by CWTS/University of Leiden

Background material

University of Helsinki
- Basic information about the University of the Helsinki
- The structure of doctoral training at the University of Helsinki
- Previous evaluations of research at the University of Helsinki – links to the reports: 1998 and 2005

The Finnish Universities/Research Institutes
- Finnish University system
- Evaluation of the Finnish National Innovation System
- The State and Quality of Scientific Research in Finland, Publication of the Academy of Finland 9/09.

The evaluation panels were provided also with other relevant material on request before the meetings in Helsinki.
1.6 Evaluation questions and material

The participating RCs answered the following evaluation questions which are presented according to the evaluation form. In addition, TUHAT RIS was used to provide the additional material as explained. For giving the feedback to the RCs, the panellists received the evaluation feedback form constructed in line with the evaluation questions:

1. Focus and quality of the RC’s research
   - Description of
     - the RC’s research focus.
     - the quality of the RC’s research (incl. key research questions and results)
     - the scientific significance of the RC’s research in the research field(s)
   - Identification of the ways to strengthen the focus and improve the quality of the RC’s research

The additional material: TUHAT compilation of the RC’s publications, analysis of the RC’s publications data (provided by University of Leiden and the Helsinki University Library)
A written feedback from the aspects of: scientific quality, scientific significance, societal impact, innovativeness
   - Strengths
   - Areas of development
   - Other remarks
   - Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

2. Practises and quality of doctoral training
   - Organising of the doctoral training in the RC. Description of the RC’s principles for:
     - recruitment and selection of doctoral candidates
     - supervision of doctoral candidates
     - collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes
     - good practises and quality assurance in doctoral training
     - assuring of good career perspectives for the doctoral candidates/fresh doctorates
   - Identification of the RC’s strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.

The additional material: TUHAT compilation of the RC’s other scientific activities/supervision of doctoral dissertations
A written feedback from the aspects of: processes and good practices related to leadership and management
   - Strengths
   - Areas of development
   - Other remarks
   - Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

3. The societal impact of research and doctoral training
   - Description on how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).
   - Identification of the ways to strengthen the societal impact of the RC’s research and doctoral training.

The additional material: TUHAT compilation of the RC’s other scientific activities.
A written feedback from the aspects of: societal impact, national and international collaboration, innovativeness
   - Strengths
   - Areas of development
   - Other remarks
   - Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)
4. **International and national (incl. intersectoral) research collaboration and researcher mobility**
   - Description of
     - the RC’s research collaborations and joint doctoral training activities
     - how the RC has promoted researcher mobility
   - Identification of the RC’s strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.

A written feedback from the aspects of: scientific quality, national and international collaboration
   - Strengths
   - Areas of development
   - Other remarks
   - Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

5. **Operational conditions**
   - Description of the operational conditions in the RC’s research environment (e.g. research infrastructure, balance between research and teaching duties).
   - Identification of the RC’s strengths and challenges related to operational conditions, and the actions planned for their development.

A written feedback from the aspects of: processes and good practices related to leadership and management
   - Strengths
   - Areas of development
   - Other remarks
   - Recommendations

6. **Leadership and management in the researcher community**
   - Description of
     - the execution and processes of leadership in the RC
     - how the management-related responsibilities and roles are distributed in the RC
     - how the leadership- and management-related processes support
       - high quality research
       - collaboration between principal investigators and other researchers in the RC
       - the RC’s research focus
       - strengthening of the RC’s know-how
     - identification of the RC’s strengths and challenges related to leadership and management, and the actions planned for developing the processes

7. **External competitive funding of the RC**
   - The RCs were asked to provide information of such external competitive funding, where:
     - the funding decisions have been made during 1.1.2005-31.12.2010, and
     - the administrator of the funding is/has been the University of Helsinki
   - On the e-form the RCs were asked to provide:
     1) The relevant funding source(s) from a given list (Academy of Finland/Research Council, TEKES/The Finnish Funding Agency for Technology and Innovation, EU, ERC, foundations, other national funding organisations, other international funding organisations), and
     2) The total sum of funding which the organisation in question had decided to allocate to the RCs members during 1.1.2005–31.12.2010.

Competitive funding reported in the text is also to be considered when evaluating this point.

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, innovativeness, future significance
   - Strengths
   - Areas of development
   - Other remarks
   - Recommendations

8. **The RC’s strategic action plan for 2011–2013**
   - RC’s description of their future perspectives in relation to research and doctoral training.

A written feedback from the aspects of: scientific quality, scientific significance, societal impact, processes and good practices related to leadership and management, national and international collaboration, innovativeness, future significance
   - Strengths
   - Areas of development
9. Evaluation of the category of the RC in the context of entity of the evaluation material (1-8)

The RC's fitness to the chosen participation category
A written feedback evaluating the RC's fitness to the chosen participation category
- Strengths
- Areas of development
- Other remarks
- Recommendations

Numeric evaluation: OUTSTANDING (5), EXCELLENT (4), VERY GOOD (3), GOOD (2), SUFFICIENT (1)

10. Short description of how the RC members contributed the compilation of the stage 2 material
Comments on the compilation of evaluation material

11. How the UH's focus areas are presented in the RC's research?
Comments if applicable

12. RC-specific main recommendations based on the previous questions 1–11

13. RC-specific conclusions

1.7 Evaluation criteria

The panellists were expected to give evaluative and analytical feedback to each evaluation question according to their aspects in order to describe and justify the quality of the submitted material. In addition, the evaluation feedback was asked to be pointed out the level of the performance according to the following classifications:
- outstanding (5)
- excellent (4)
- very good (3)
- good (2)
- sufficient (1)

Evaluation according to the criteria was to be made with thorough consideration of the entire evaluation material of the RC in question. Finally, in questions 1-4 and 9, the panellists were expected to classify their written feedback into one of the provided levels (the levels included respective descriptions, 'criteria'). Some panels used decimals in marks. The descriptive level was interpreted according to the integers and not rounding up the decimals by the editors.

Description of criteria levels

Question 1 – FOCUS AND QUALITY OF THE RC’S RESEARCH

Classification: Criteria (level of procedures and results)

Outstanding quality of procedures and results (5)
Outstandingly strong research, also from international perspective. Attracts great international interest with a wide impact, including publications in leading journals and/or monographs published by leading international publishing houses. The research has world leading qualities. The research focus, key research questions scientific significance, societal impact and innovativeness are of outstanding quality.

In cases where the research is of a national character and, in the judgement of the evaluators, should remain so, the concepts of “international attention” or “international impact” etc. in the grading criteria above may be replaced by “international comparability”.
Operations and procedures are of outstanding quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are in alignment with the documentation. The ambition to develop the community together is of outstanding quality.

**Excellent quality of procedures and results (4)**

Research of excellent quality. Typically published with great impact, also internationally. Without doubt, the research has a leading position in its field in Finland.

Operations and procedures are of excellent quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of excellent quality.

**Very good quality of procedures and results (3)**

The research is of such very good quality that it attracts wide national and international attention.

Operations and procedures are of very good quality, transparent and shared in the community. The improvement of research and other efforts are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of very good quality.

**Good quality of procedures and results (2)**

Good research attracting mainly national attention but possessing international potential, extraordinarily high relevance may motivate good research.

Operations and procedures are of good quality, shared occasionally in the community. The improvement of research and other efforts are occasionally documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of good quality.

**Sufficient quality of procedures and results (1)**

In some cases the research is insufficient and reports do not gain wide circulation or do not have national or international attention. Research activities should be revised.

Operations and procedures are of sufficient quality, shared occasionally in the community. The improvement of research and other efforts are occasionally documented and operations and practices are to some extent in alignment with the documentation. The ambition to develop the community together is of sufficient quality.

**Question 2 – DOCTORAL TRAINING**

**Question 3 – SOCIETAL IMPACT**

**Question 4 – COLLABORATION**

**Classification: Criteria (level of procedures and results)**

**Outstanding quality of procedures and results (5)**

Procedures are of outstanding quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are in alignment with the documentation. The ambition to develop the community together is of outstanding quality. The procedures and results are regularly evaluated and the feedback has an effect on the planning.

**Excellent quality of procedures and results (4)**

Procedures are of excellent quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and management are documented and operations and practices are to large extent in alignment with the documentation. The ambition to develop the community together is of excellent quality. The procedures and outcomes are evaluated and the feedback has an effect on the planning.

**Very good quality of procedures and results (3)**

Procedures are of very good quality, transparent and shared in the community. The practices and quality of doctoral training/societal impact/international and national collaboration/leadership and
management are documented and operations and practices are to large extent in alignment with the
documentation. The ambition to develop the community together is of very good quality.

**Good quality of procedures and results (2)**

Procedures are of good quality, shared occasionally in the community. The practices and quality of
doctoral training/societal impact/international and national collaboration/leadership and
management are documented and operations and practices are to large extent in alignment with the
documentation. The ambition to develop the community together is of good quality.

**Sufficient quality of procedures and results (1)**

Procedures are of sufficient quality, transparent and shared in the community. The practices and
quality of doctoral training/societal impact/international and national collaboration/leadership and
management are occasionally documented and operations and practices are to some extent in
alignment with the documentation. The ambition to develop the community together is of sufficient
quality.

**Question 9 – CATEGORY**

Participation category – fitness for the category chosen

The choice and justification for the chosen category below should be reflected in the RC's responses to the
evaluation questions 1–8.

1. *The research of the participating community represents the international cutting edge in its field.*
2. *The research of the participating community is of high quality, but the community in its present
   composition has yet to achieve strong international recognition or a clear break-through.*
3. *The research of the participating community is distinct from mainstream research, and the special
   features of the research tradition in the field must be considered in the evaluation. The research is
   of high quality and has great significance and impact in its field. However, the generally used
   research evaluation methods do not necessarily shed sufficient light on the merits of the
   research.*
4. *The research of the participating community represents an innovative opening.* A new opening can
   be an innovative combination of research fields, or it can be proven to have a special social,
   national or international demand or other significance. Even if the researcher community in its
   present composition has yet to obtain proof of international success, its members can produce
   convincing evidence of the high level of their previous research.
5. *The research of the participating community has a highly significant societal impact.* The
   participating researcher community is able to justify the high social significance of its research.
   The research may relate to national legislation, media visibility or participation in social debate,
   or other activities promoting social development and human welfare. In addition to having
   societal impact, the research must be of a high standard.

**An example of outstanding fitness for category choice (5)**

The RC's representation and argumentation for the chosen category were convincing. The RC recognized
its real capacity and apparent outcomes in a wider context to the research communities. The specific
character of the RC was well-recognized and well stated in the responses. The RC fitted optimally for the
category.

- Outstanding (5)
- Excellent (4)
- Very good (3)
- Good (2)
- Sufficient (1)

The above-mentioned definition of outstanding was only an example in order to assist the panellists in
the positioning of the classification. There was no exact definition for the category fitness.

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5 The panels discussed the category fitness and made the final conclusions of the interpretation of it.
1.8 Timetable of the evaluation

The main timetable of the evaluation:

1. Registration                 November 2010
3. External peer review         May–September 2011
4. Published reports
   - University level public report  March–April 2012
   - RC specific reports

The entire evaluation was implemented during the university’s strategy period 2010–2012. The preliminary results were available for the planning of the following strategy period in late autumn 2011. The evaluation reports will be published in March/April 2012. More detailed time schedule is published in the University report.

1.9 Evaluation feedback – consensus of the entire panel

The panellists evaluated all the RC-specific material before the meetings in Helsinki and mailed the draft reports to the evaluation office. The latest interim versions were on-line available to all the panellists on the Wiki-sites. In September 2011, in Helsinki the panels discussed the material, revised the first draft reports and decided the final numeric evaluation. After the meetings in Helsinki, the panels continued working and finalised the reports before the end of November 2011. The final RC-specific reports are the consensus of the entire panel.

The evaluation reports were written by the panels independently. During the editing process, the evaluation office requested some clarifications from the panels when necessary. The tone and style in the reports were not harmonized in the editing process. All the reports follow the original texts written by the panels as far as it was possible.

The original evaluation material of the RCs, provided for the panellists is attached at the end of the report. It is essential to notice that the exported lists of publications and other scientific activities depend how the data was stored in the TUHAT-RIS by the RCs.
2 Evaluation feedback

2.1 Focus and quality of the RC’s research

- Description of
  - the RC’s research focus
  - the quality of the RC’s research (incl. key research questions and results)
  - the scientific significance of the RC’s research in the research field(s)

- Identification of the ways to strengthen the focus and improve the quality of the RC’s research

ASPECTS: Scientific quality, scientific significance, societal impact, innovativeness

This group is being assessed through criteria 3. The publications are rated as having an average impact in the field, but the submission makes it clear that the research needs to be evaluated as well within a local context and in terms of impact on society.

The research findings certainly sound interesting, such as the movement of diatoms in the environment and morphological polymorphism associated with whitefish. These studies have been published in good international journals such as Ecology, Journal of Animal Ecology and so on. There is also a good record of publications in more applied journals, and links to topical areas such as climate change adaptation. The group has also focused on large studies, often concluded by policy aiding scientific reports, and that lead to management implications being considered from a number of different perspectives.

The group proposes a measure of output based on the ratio of funding and number of peer reviewed publications. While it is certainly important to publish papers in the peer reviewed literature, which this RC after all does well, we would be reluctant to adopt such a measure given that there are traditionally differences between research areas in publication rates and impact (which we are quite well aware of) and funding required for research, and also that a low number of high quality publications can be just as valuable as a high number of lower quality papers.

We note the comment about publishing in the higher ranked literature but wondered at the same time about also aiming to publish in the more general literature (which can increase the profile of the group). It was unclear to us what the focus of a CoE application would be: what is the theme to be explored? We are also curious about how the group sees themselves as being different to others with similar expertise, both nationally and internationally. What does the group do better than others? What is missing to improve the range of areas of expertise covered by the group? There is clearly a lot of good work going on in the group but we did not get the sense from the submission that the group is necessarily looking forward, although an interesting interface is mentioned between them and the biotechnology/genomics sector.

Numeric evaluation: 3 (Very good)

2.2 Practises and quality of doctoral training

- Organising of the doctoral training in the RC. Description of the RC’s principles for:
  - recruitment and selection of doctoral candidates
  - supervision of doctoral candidates
  - collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes
  - good practises and quality assurance in doctoral training
  - assuring of good career perspectives for the doctoral candidates/fresh doctorates

- Identification of the RC’s strengths and challenges related to the practises and quality of doctoral training, and the actions planned for their development.

- Additional material: TUHAT compilation of the RC’s other scientific activities/supervision of doctoral dissertations
The postgraduate supervision follows a model of having a senior supervisor and with others sharing the supervision “where appropriate”. Unfortunately, the latter is not further explained, but it could be based on the wide diversity of themes and hence expertise that are present in this RC. The committee structure is interesting in that there are one or two external members included. This seems like an excellent arrangement to provide applied input into projects. The opportunity for students to spend time abroad is important and can expand the breadth of the student’s experience.

We would have liked more details about the percentage of students that had opportunities to travel abroad for short or longer work visits seen the reported growing international outreach of some of its themes and members. So for instance, what percentage of students takes advantage of travel opportunities and attend international meetings or go for true work visits? How many students spend part of their graduate period abroad? Also what is the success in placing students in postdoc positions? Are graduate outcomes monitored?

We note that few students fail their thesis due to “very intensive and personal supervision”, but this can also be a weakness (students need also to develop independent skills rather than be dependent on the supervisor). How is a balance achieved?

**Numeric evaluation: 2.7 (Good)**

### 2.3 The societal impact of research and doctoral training

- **Description on how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).**
- **Identification of the ways to strengthen the societal impact of the RC’s research and doctoral training.**
- **Additional material: TUHAT compilation of the RC’s other scientific activities.**

We recognize this as a real strength of the group. The lake management project outlined in the application is impressive in describing a local problem that has led to important scientific work as well as applied outcomes nationally but also increasingly internationally. The fish management example is also an important one. It is terrific to see strong links between research and management of this nature being developed. The involvement of PhD students in these exercises is also important.

We note the comment about “appreciation” of such work by the scientific community, and it is always a challenge to combine these two areas. Ideally the two areas need to be combined, and we did wonder about what opportunities there might exist for capturing the benefits of engaging in both areas. Are they always mutually exclusive? We think it is also important to capture important societal contributions through some more sophisticated statistics, like number of popular articles, impact of research in wider community, which is clearly the case here.

**Numeric evaluation: 4 (Excellent)**

### 2.4 International and national (incl. intersectoral) research collaboration and researcher mobility

- **Description of**
  - the RC’s research collaborations and joint doctoral training activities
  - how the RC has promoted researcher mobility
- **Identification of the RC’s strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.**

**ASPECTS: Scientific quality, national and international collaboration**
There seems to be a growing, strong culture of promoting international collaborations in this RC. A number of international links are listed, although they tend to be focused on Europe. There are also very strong connections to institutes at the national level.

The submission notes the enduring attempts to increase mobility. We suspect that it is important to set some goals in this specific area in terms of the number of submissions for instance with other institutes. Also how will any increase in mobility be measured to assess success of any new initiatives? There was also no information on mobility of postgraduate students in the submission, this was provided as part of other RC submissions.

**Numeric evaluation: 2.7 (Good)**

### 2.5 Operational conditions

- *Description of the operational conditions in the RC’s research environment (e.g. research infrastructure, balance between research and teaching duties).*
- *Identification of the RC’s strengths and challenges related to operational conditions, and the actions planned for their development.*

**ASPECTS: Processes and good practices related to leadership and management**

There seem to be excellent research facilities available to the group, with a strong network of well-selected research stations and good facilities for culturing species. The submission notes several items of equipment that could be usefully purchased. Are these essential for new research directions or for day-to-day operations of the group? We did not really get a sense from the submission whether the group considered equipment and facilities adequate or whether there was a clear vision to obtain additional infrastructure essential for the group.

### 2.6 Leadership and management in the researcher community

- *Description of*
  - the execution and processes of leadership in the RC
  - how the management-related responsibilities and roles are distributed in the RC
  - how the leadership- and management-related processes support
    - high quality research
    - collaboration between principal investigators and other researchers in the RC
    - the RC’s research focus
    - strengthening of the RC’s know-how
- *Identification of the RC’s strengths and challenges related to leadership and management, and the actions planned for developing the processes*

**ASPECTS: Processes and good practices related to leadership and management**

The submission seems to suggest a flat and informal structure to RC management. There are seminars and group discussions, but it was not clear to us how decisions were made about the RC’s directions (including each of the listed groups themselves) and large funding initiatives. In fact, these different groups of the RC seem to work quite independently, and the added value of the RC is not so evident.

There is a Centre of Excellence (CoE) proposal being planned, but it was not clear what the focus of this centre would be, and also what benefits were likely to be derived from developing and hosting this centre. Would the management and leadership structure of the RC change if the CoE application was successful?
2.7 External competitive funding of the RC

- The RCs were asked to provide information of such external competitive funding, where:
  - the funding decisions have been made during 1.1.2005–31.12.2010, and
  - the administrator of the funding is/has been the University of Helsinki
- On the e-form the RCs were asked to provide:
  1) The relevant funding source(s) from a given list (Academy of Finland/Research Council, TEKES/The Finnish Funding Agency for Technology and Innovation, EU, ERC, foundations, other national funding organisations, other international funding organizations), and
  2) The total sum of funding which the organisation in question had decided to allocate to the RCs members during 1.1.2005–31.12.2010.

Competitive funding reported in the text is also to be considered when evaluating this point.

ASPECTS: Scientific quality, scientific significance, societal impact, innovativeness and future significance

The RC has been successful in gaining substantial funding for projects from the Academy and also from local and other national agencies. The overall acquired funding of 6 million Euro over 6 years for the group (that is at a given moment composed of 28 members) seems moderate given the scale of some of the projects. We do note that there has not been a strong culture of obtaining funding from the EU initiatives, but it is not clear how many calls for proposals in recent years by the EC had specific topics in this field.

It would have been good to see some targets set in the submission. Is the funding base considered adequate? Apart from the CoE application, are there other attempts to expand the funding base? Given the strong and still growing EU connections of the centre, are there initiatives that could be considered for further funding within the EU and even beyond? The RC could be even more active in seeking EC FP funding.

2.8 The RC’s strategic action plan for 2011–2013

- RC’s description of their future perspectives in relation to research and doctoral training.

ASPECTS: Scientific quality, scientific significance, societal impact, processes and good practices related to leadership and management, national and international collaboration, innovativeness, future significance

It is good to see that a number of new projects are starting in 2011. However it was not clear from the submission whether the group has clear targets for the future for many aspects of its activities.

We wonder also if the group has specific targets at all and whether it makes active efforts to compare itself to other groups.

Are there plans how to integrate the work of the different groups within RC?

The submission notes a desire to publish in higher impact (general) journals, and we wonder what has prevented the group from doing this earlier already.

2.9 Evaluation of the category of the RC in the context of entity of the evaluation material (1–8)

The RC’s fitness to the chosen participation category.

Category 3. The research of the participating community is distinct from mainstream research, and the special features of the research tradition in the field must be considered in the evaluation.

The chosen category is Ok, although it could as well have been the one on high societal impact.

Numeric evaluation: 4 (Excellent)
2.10 Short description of how the RC members contributed the compilation of the stage 2 material

The PIs were involved in the preparation, but the main responsibility has clearly been with the leader of the RC.

2.11 How the UH’s focus areas are presented in the RC’s research

Focus area 3: The changing environment – clean water

This RC is in the core of the UH focus area Changing environment-clean water.

2.12 RC-specific main recommendations

We appreciate the applied work carried out by this RC and its importance in a local context, but would also recommend that the group consider how their data could be used to answer questions of broader interest to the scientific community. We recommend that postgraduate training outcomes be tracked in the group and also that there is broader involvement from the community in student supervision. The Panel considered that the RC had a substantial and important societal impact but felt that this impact could be captured more effectively. The RC needs to set clearer goals about mobility and funding and the group needs to develop additional cohesion and integration to demonstrate that it is a feasible RC with tangible benefits derived from combining expertise.

2.13 RC-specific conclusions

The FRESH group has potential to develop into a strong RC but the vision and integration of the group requires more thought and planning. Specific targets should be set around funding and postgraduate student supervision and the potential benefits of integration are not yet clear.

2.14 Preliminary findings in the Panel-specific feedback

The FRESH group has strengths in freshwater ecology and management that have already led to interesting research and papers. The group is well connected to management agencies and has had an impact on policy and management. There is a substantial cohort of postgraduate students. However the Panel feels that the FRESH RC needs further development. Based on the material provided, the level of integration across the group and its potential benefits are somewhat unclear. There is not yet a clear vision about how the group might move forward although some interesting ideas are presented. The group needs to develop targets around funding and publications and pathways to meet these targets. There is potential for multidisciplinary research but this requires a more detailed plan of action.

2.15 Preliminary findings in the University-level evaluation

There are some issues around doctoral training (consistency across RCs, postgraduate experience of being part of a community) that are relevant to University of Helsinki level recommendations.
3 Appendices

A. Original evaluation material
   a. Registration material – Stage 1
   b. Answers to evaluation questions – Stage 2
   c. List of publications
   d. List of other scientific activities

B. Bibliometric analyses
   a. Analysis provided by CWTS/University of Leiden
   b. Analysis provided by Helsinki University Library (66 RCs)
International evaluation of research and doctoral training at the University of Helsinki 2005-2010

RC-SPECIFIC MATERIAL FOR THE PEER REVIEW

NAME OF THE RESEARCHER COMMUNITY:
Freshwater Research (FRESH)

LEADER OF THE RESEARCHER COMMUNITY:
Professor Jukka Horppila, Section of Aquatic Sciences, Department of Environmental Sciences

RC-SPECIFIC MATERIAL FOR THE PEER REVIEW:

- Material submitted by the RC at stages 1 and 2 of the evaluation
  - STAGE 1 material: RC’s registration form (incl. list of RC participants in an excel table)
  - STAGE 2 material: RC’s answers to evaluation questions
- TUHAT compilations of the RC members’ other scientific activities 1.1.2005-31.12.2010
  (analysis carried out by CWTS, Leiden University)

NB! Since Web of Science(WoS)-based bibliometrics does not provide representative results for most RCs representing humanities, social sciences and computer sciences, the publications of these RCs will be analyzed by the UH Library
(results available by the end of June, 2011)
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

1 RESPONSIBLE PERSON

Name: Horppila, Jukka
E-mail:
Phone: 358-9-19158473
Affiliation: Univ. of Helsinki, Dpt of Environmental Sciences, Section of Aquatic Sciences
Street address: P.O. Box 65 (Viikinkaari 1), 00014 University of Helsinki

2 DESCRIPTION OF THE PARTICIPATING RESEARCHER COMMUNITY (RC)

Name of the participating RC (max. 30 characters): Freshwater Research
Acronym for the participating RC (max. 10 characters): FRESH
Description of the operational basis in 2005-2010 (eg. research collaboration, joint doctoral training activities) on which the RC was formed (MAX. 2200 characters with spaces): Fresh waters are an invaluable natural resource. Thus, research on the functioning and management of fresh waters are essential. The FRESH research community is the main group performing research and doctoral training on fresh waters in the University of Helsinki. Within the group, collaboration both in research and doctoral training is intensive and thus FRESH forms a very solid research community.

3 SCIENTIFIC FIELDS OF THE RC

Main scientific field of the RC’s research: biological, agricultural and veterinary sciences
RC’s scientific subfield 1: Limnology
RC’s scientific subfield 2: Marine and Freshwater Biology
RC’s scientific subfield 3: Fisheries
RC’s scientific subfield 4: Ecology
Other, if not in the list:

4 RC’S PARTICIPATION CATEGORY

Participation category: 3. Research of the participating community is distinct from mainstream research, and the special features of the research tradition in the field must be considered in the evaluation

Justification for the selected participation category (MAX. 2200 characters with spaces): The generally used evaluation methods do not necessarily take into account some special features connected to the research of our RC. The research in our RC is often problem-based, and the freshwater research community is relatively small compared with many other fields of research, which is reflected in the impact factors of the journals. Additionally, the high number of articles published in publications directed at societies of
expertise and general public are not often given credit in scientific evaluations. However, such publications are very valuable for the societal impact of the research.

5 DESCRIPTION OF THE RC’S RESEARCH AND DOCTORAL TRAINING

Public description of the RC’s research and doctoral training (MAX. 2200 characters with spaces): The research in FRESH research community covers a wide variety of aspects connected to fresh waters. These include the ecology and functioning of freshwater ecosystems, food web interactions, physical-chemical forces regulating the ecosystems, the effects of climate change on fresh waters, as well as the connections between freshwater systems and their catchment areas. Both lake and river ecosystems are included in the studies. Some studies have also branched to the brackish waters of the Baltic Sea. The studies are often problem-based and many projects are connected to the management of fresh waters and exploitation of their fish populations. The group includes 28 members, including professors, university lecturers, senior researchers, postdoctoral researchers, and doctoral candidates. Doctoral training is an important part of the group’s work and doctoral degrees are earned annually. Numerous international Ph. D students are working in the group and research visits from FRESH to other universities are regular. The research group is situated in the Department of Environmental Sciences at the Viikki Campus in Helsinki and in the City of Lahti.

Significance of the RC’s research and doctoral training for the University of Helsinki (MAX. 2200 characters with spaces): The research by FRESH covers the majority of the freshwater research accomplished in the University of Helsinki. The topics range from cutting-edge approaches to restoration and management of freshwater ecosystems, global change, ecological engineering, as well as evolutionary ecology and conservation of fish populations. Doctoral degrees are earned annually in the group and due to the large diversity of the study topics, students completing Ph. D studies in the group can be employed by different national and international universities, research institutes, as well as consulting companies performing aquatic research.

Keywords: fresh water, limnology, biology, ecology, fisheries, management

6 QUALITY OF RC’S RESEARCH AND DOCTORAL TRAINING

Justified estimate of the quality of the RC’s research and doctoral training at national and international level during 2005-2010 (MAX. 2200 characters with spaces): FRESH is a solid community taking part in a wide range of research activities in freshwater sciences. We frequently publish in the top journals of subject category (limnology and fisheries) and a number the studies are published in general ecological and biological journals. During the research evaluation period, we have succeeded with several research applications submitted to highly competitive research funding sources (Academy of Finland, University of Helsinki). As a major national research funding organization, Academy of Finland has allocated up to three Academy Research Fellow positions to members of FRESH in order to still increase the long-term quality of our research. According to the quality and quantity of publications and doctoral theses, FRESH is nationally a top institute in freshwater sciences. The most important results for society are also disseminated via popular forums. Internationally, FRESH is well-established in its field. Recently, FRESH has published in journals with a high quality and activated in production of PhD theses. Members of FRESH take part in all
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 1 MATERIAL (registration form)

activities in the international scientific community such as editorial work, collaborative publications, symposia, workshops and invited talks.

Comments on how the RC’s scientific productivity and doctoral training should be evaluated (MAX. 2200 characters with spaces): We propose that research productivity could be evaluated according to widely used measures: number of peer reviewed publications, number of peer reviewed publications per person per year, average quality of journals published (impact factor), average number of citations per publication, number of popularized articles, number of PhD theses produced. In addition, we suggest a new measure of calculating the ratio between total amount of allocated research funding and number of peer reviewed publications.
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<td>Uusikivi</td>
<td>Jari</td>
<td>Doctoral candidate</td>
<td>UH, Dpt of Environmental Sciences, Section of Aquatic Sciences</td>
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<td>Virtanen</td>
<td>Laura</td>
<td>Doctoral candidate</td>
<td>UH, Dpt of Environmental Sciences, Section of Aquatic Sciences</td>
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<td>Vähätalo</td>
<td>Anssi</td>
<td>Senior Researcher - Academy research fellow</td>
<td>UH, Dpt of Environmental Sciences, Section of Aquatic Sciences</td>
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<td>Xiao</td>
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<td>Doctoral candidate</td>
<td>UH, Dpt of Environmental Sciences, Section of Aquatic Sciences</td>
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INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC STAGE 2 MATERIAL

BACKGROUND INFORMATION

Name of the RC’s responsible person: Horppila, Jukka
E-mail of the RC’s responsible person: 
Name and acronym of the participating RC: Freshwater Research, FRESH
The RC’s research represents the following key focus area of UH: 3. Muuttuva ympäristö – puhdas vesi – The changing environment - clean water
Comments for selecting/not selecting the key focus area: The RC’s research perfectly fits the focus area "The changing environment - clean water". The research of the RC is focused on the functioning and management of freshwater ecosystems, and on the challenges that environmental changes set for managers to maintain the good water quality.

1 FOCUS AND QUALITY OF RC’S RESEARCH (MAX. 8800 CHARACTERS WITH SPACES)

- Description of the RC’s research focus, the quality of the RC’s research (incl. key research questions and results) and the scientific significance of the RC’s research for the research field(s).

General
The high significance of the RC’s research for the research field is reflected both in the publication forums and in funding. The results have been frequently published in the top journals of the discipline. During the evaluation period, the RC succeeded with many research applications submitted to highly competitive funding sources and external funding granted for the RC during 2005-2010 reached altogether 6000000 € (in addition to the 5370000 € funding reported in the e-form, the RC received 633000 € from foundations that give the grants directly to the recipients).

The main focus of the RC’s research is to clarify the mechanisms regulating the functioning of freshwater ecosystems, and to use the knowledge for their management and restoration. The studies include basic ecological research, and problem-oriented studies connected to the environmental problems and management of fresh waters. The research in FRESH includes ecological and evolutionary studies, food web interactions as well as physical-chemical regulatory studies. As a holistic RC, FRESH utilizes lakes, ponds and rivers as well as Baltic Sea as study sites. For clarity, below the different studies are divided into three main categories, although most studies include aspects from all categories.

Ecological and biological studies
In the basic ecological research by FRESH, one of the main focuses during the study period has been the community ecology of freshwater organisms, especially large-scale patterns in community structure and diversity. Besides increasing basic ecological knowledge, the studies aim to develop methods for biomonitoring of streams using diatoms. The studies have shown e.g. that unicellular organisms do not disperse freely in freshwaters, but rather are strongly spatially structured following similar biogeographical patterns as those observed for larger organisms (Soininen et al. 2007, Ecology). In fish ecology, main focuses have been on the ecomorphological divergence of polymorphic whitefish (Coregonus lavaretus) beyond the traditional littoral-pelagic resource axis. One of the key results has been that phenotype-environment correlations are pronounced, where morphological adaptations such as head and gill raker traits are correlated to habitat, diet, isotopic signatures and prey size (Harrod et al. 2010, Journal of Animal Ecology, Kahlilainen et al. 2011, Evolutionary Ecology).
Large projects have also been targeted to the effects of predicted environmental changes and abiotic and biotic disturbances on freshwater food webs. Key research issues include the effects of disturbances (turbidity, water colour, turbulence) on aquatic communities through species-specific and/or gender-specific effects on feeding activity and refuge use (Nurminen & Horppila 2006, Limnology and Oceanography, Stapanian et al. 2010, Fish and Fisheries). The studies have shown that the juvenile growth bottleneck of perch (Perca fluviatilis) does not only depend on competition, but also on the species-specific effects of water transparency variations (Estlander et al. 2010, Journal of Fish Biology). A novel finding was also that water quality variations may regulate sexual dimorphism in fish populations (Horppila et al., Oikos in press). Large studies on the effects of turbulence on the dominance relationships between different predators were started in 2010 and experimental work is going on.

Studies on physical-chemical regulatory mechanisms

The cycling of carbon between terrestrial and aquatic ecosystems, and solar radiation-induced photochemistry have had an important role in the RC’s studies. The photochemistry studies focus on the role of dissolved organic matter (DOM) for the functioning of aquatic ecosystems, photochemical transformation of natural organic matter as well as optical properties of surface waters and ice. The studies aimed to reduce chemical pollution in the environment by developing a tool, which can assess the photochemical reactivity of anthropogenic chemicals. The studies have shown that DOM absorbs hydrophobic harmful chemicals, and controls their fate in aquatic systems (Kuivikkö et al. 2010, Environmental Toxicology and Chemistry) and that solar radiation can mineralize wetland DOC and its chromophores completely (Vähätalo & Wetzel 2008, Limnology and Oceanography). Studies on carbon cycling showed that lakes can act as sources of carbon gases to the atmosphere (Ojala et al., Limnology and Oceanography in press).

Another important research focus has been on the role of sediment resuspension in regulating nutrient recycling in lakes and in the coastal areas of the Baltic Sea, and on the factors (e.g. vegetation) that govern the magnitude of resuspension. Studies showed that vegetation impact on resuspension rate and nutrient recycling depends on the life form of the plants (Nurminen & Horppila 2009, Water Research) and that the effect of resuspension on water N:P-ratio depends on the phase of the growing season, with implications for the tendency of cyanobacteria to form blooms in late summer (Niemistö et al. 2008, Limnology and Oceanography). Studies also demonstrated that the annual resuspension-mediated internal loading in a lake can increase by 28% with the climate change scenario of 2 x CO2 and 2 month reduction of the ice-cover period (Niemistö & Horppila 2007, Journal of Environmental Quality).

Studies on nitrogen retention (especially denitrification) in lakes were started in the last years of the evaluation period. The main targets of these studies are the role of denitrification in nutrient retention of lakes, and factors regulating denitrification. These studies have implications for the variable obligations of inland wastewater treatment plants to remove N, depending on their distance from the N-limited Baltic Sea.

Problem-oriented studies on management of freshwater ecosystems

In management-related studies by the RC, one of the main study aspects during the evaluation period was the role of food web structure and water quality in affecting the validity of food web management as a lake restoration tool. Studies showed that the theories and hypotheses behind food web management do not hold in all clay-turbid waters, an aspect not previously recognized (Horppila & Liljendahl-Nurminen 2005, Restoration Ecology). This was shown to be caused by numerous factors, one of the most important being the combined effects of different refuges on predator-prey interactions (Liljendahl-Nurminen et al. 2008, Freshwater Biology). Studies on food web management also produced
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a special issue of Advances in Limnology (volume 59, 2005) including 15 articles. Another large study focus connected to lake management was started in 2009: the studies aim to find out, if aeration is an effective restoration tool in the changing climate as the importance of anaerobic P mobilization in nutrient cycling may be decreasing, and to clarify the negative side-effects of many aeration methods.

In fisheries, the Sustainable Fishing – project aims to determine the prerequisites that fishing methods and regulations have to fulfill to ensure the growth, production and genetic biodiversity of fish populations, and to define the factors influencing the demographic structure of fish populations through food web interactions and fishing. The studies have shown that intensive fishing of large individuals can substantially reduce the amount and quality of reproductive potential of perch population and that the quality of eggs and fry does not increase after pike (Esox lucius) reach certain size /age (submitted manuscripts).

- Ways to strengthen the focus and improve the quality of the RC’s research.

The results are frequently published in the top journals of the discipline (e.g. Limnology and Oceanography, Freshwater Biology, Water Research, Canadian Journal of Fisheries and Aquatic Sciences, Fish and Fisheries). In the future, the RC aims to publish more papers in highly-ranked general journals reaching wider scope of readers from multiple disciplines. This development has already started as several papers have been recently published or are in press in such journals (e.g. Biogeochemistry, Ecology, Evolutionary Ecology, Journal of Geophysical Research, Journal of Animal Ecology). The development will be accelerated e.g. by intensifying the national and international collaboration in research, which facilitates the collection, combination and publication of more comprehensive datasets. To achieve this, FRESH will prepare applications for a Centre of Excellence of the Academy of Finland and for the European Research Council.

2 PRACTICES AND QUALITY OF DOCTORAL TRAINING (MAX. 8800 CHARACTERS WITH SPACES)

- How is doctoral training organised in the RC? Description of the RC’s principles for recruitment and selection of doctoral candidates, supervision of doctoral candidates, collaboration with faculties, departments/institutes, and potential graduate schools/doctoral programmes, good practises and quality assurance in doctoral training, and assuring good career perspectives for the doctoral candidates/fresh doctorates.

FRESH promotes the choice of scientific career of M. Sc. students via innovative field and lab courses and summer jobs in field work during the M. Sc. studies. The students have also the possibility to get credits by participating in teaching and in the work of research projects. Recruitment of PhD students is done using international announcements (nowadays mostly via e-mail). Selection is based on the documents of the applicants (CV, publication list, invited talks) and by interviews when appropriate. Each PI has the main responsibility of the supervision of the Ph. D. students working in the fields of their expertise. When appropriate, the supervision is shared with PI’s, and postdoctoral researchers of the group are involved in supervision to promote their way to group leadership. Such organization facilitates efficient supervision due to frequent contacts of doctoral students with the supervising PI’s. Additionally, following the instructions by the Faculty of Biological and Environmental Sciences, each PhD student has as an advisory committee assembled by the PI and the student. The committee consists of two to four external experts (e.g. from other universities, Finnish Environment Institute, Finnish Game and Fisheries Research Institute) with the necessary academic qualifications to assess the progress of dissertation work. At least two of the committee members hold the qualifications of a docent or equivalent academic qualifications. The external experts are independent in relation to the PI and the student. The committee and the Ph.D student meet at least annually at the student’s or supervisors’ invitation. The committee gives feedback on the progress of postgraduate studies and research.
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discusses the student’s research plan and gives recommendations. The PhD students are offered opportunities to practise presentations and present their research results and plans e.g. graduate school meeting as well as in the open Aquatic Sciences Seminars held fortnightly in the Department of Environmental Sciences and coordinated by the PI’s of the RC. The skills to critically evaluate published scientific papers are promoted in journal clubs arranged in FRESH. The PhD students are also encouraged to participate in international meetings and workshops. Funding for congress trips are provided either by study projects of the RC or applied from additional sources. The PhD students of FRESH have been several times awarded in international congresses. The poster by Anne Liljendahl-Nurminen (SEFS3-meeting, Edinburgh, Scotland), the oral presentation by Zeynep Peckan-Hekim (SEFS4-meeting, Krakow, Poland) and the poster by Juha Niemistö (ASLO Summer Meeting, Victoria, Canada) were selected among the top three presentations. PhD students are promoted to spend part of their graduate period abroad to learn working in international research environment and to improve their oral and written language skills.

During the evaluation period, PhD students of FRESH have been involved in Finnish Graduate School of Environmental Science and Technology (ENSTE) coordinated by University of Eastern Finland and in the Doctoral Program in Integrated Catchment and Water Resources Management (VALUE) coordinated by the University of Oulu. Additionally, the leader of the RC is a member the follow-up group of the VALUE Doctoral Program. The members of the RC are involved in the supervision of Ph. D. students both in national (University of Jyväskylä) and foreign universities (Stockholm University, Sweden, University of Tartu, Estonia) and are involved in international steering committees (e.g. University of Bordeaux). Additionally, during the evaluation period the members of the RC annually supervised Ph. D. students working on other national research institutes such as Finnish Environment Institute and Finnish Game and Fisheries Research Institute.

The RC has attempted to assure career perspectives of PhD students after the dissertation in many ways. Research funding is guaranteed for most students shortly after the dissertation, which motivates for the completion of the PhD thesis. This is important as during the period new doctors are able to apply post-doc positions abroad as well as their own research projects. During their PhD studies, the students are encouraged and supervised in writing research applications (e.g. to various foundations). This greatly helps the students in building an independent research career after their dissertation. New doctors are promoted to prefer international post-doc period after their dissertation.

- **RC’s strengths and challenges related to the practices and quality of doctoral training, and the actions planned for their development.**

The strength in doctoral training has been a very intensive and personal supervision, which has been reflected in a low number of PhD students failing to complete their thesis. Additionally, almost all articles included in the theses of the RC have been published or in press at the time of dissertation (unpublished manuscripts are allowed by the Faculty). This tradition guarantees, that the students are well experienced in all stages of scientific publication when achieving the PhD degree. A challenge is to increase the number of completed doctoral degrees. This development has already been started together with the increasing funding and more active role in the graduate schools. Another challenge is to increase the internationality of the PhD students. Attempts to accelerate the recruitment of international doctoral students are being made by increasing the collaboration with foreign institutes and by developing the distribution of information on the RC’s research (e.g. websites).
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3 SOCIETAL IMPACT OF RESEARCH AND DOCTORAL TRAINING (MAX. 4400 CHARACTERS WITH SPACES)

• Description of how the RC interacts with and contributes to the society (collaboration with public, private and/or 3rd sector).

Many research projects in the RC are problem-oriented. Projects often start from a local need for research connected e.g. to the management or restoration of lakes. Because local funding resources are often limited, the RC provides additional funding from academic sources to facilitate research activities comprehensive enough for problem-solving. Very often such projects lead to novel research ideas and new applications.

A typical example was the Lake Hiidenvesi research project (1999-2008). It started from a request by local authorities to explore the possibilities to restore the eutrophicated Lake Hiidenvesi by food web management. Additional funding was provided by FRESH and the project became one of the largest lake ecosystem studies in Finland. The project produced 70 scientific articles in international peer-reviewed journals and the research results of the project also led to guidance of the restoration efforts and in a change in the management strategies applied by authorities. On the request by the local Centre for Economic Development, Transport and the Environment, the RC gave a statement on the management of the Lake Hiidenvesi. The authorities followed the recommendation, food web management was ceased and restoration efforts were re-targeted to the drainage area. Other large problem-oriented project in the RC is the Sustainable Fishing project (2005-), which aims to improve fishing and fish stock management strategies. The research results of the project have been used in developing the fishing regulations in Finland. Numerous Fishing Districts have changed their regulations on gill net mesh sizes and minimum landing sizes of fish according to the results of the project. Multiple projects of the management practises of salmonid stockings in subarctic lakes have led to changes in fishing regulations and stocking practises. Recently started are Lake Vesijärvi studies (2009-) that explore the pros and cons of artificial aeration of lakes under the influence of the changing climate. The expertise of the group in community ecology is frequently used by environmental agencies and regional environmental centres in biomonitoring.

The management-related projects always include doctoral training. For instance, Lake Hiidenvesi project produced altogether 5 Ph. D-theses, and in the ongoing projects several Ph. D. students are involved. The students frequently participate in events where study results are presented to the public. The students have often stated that the societal impact of the studies and contacts to the public are highly motivating.

The societal aspect of the research is reflected in the high number of articles published in publications directed at societies of expertise and general public. The group has also participated in writing of numerous guide books. The group members are involved in numerous advisory committees and work groups related to management (e.g. the salmon working group of the Ministry of Agriculture and Forestry). The members of the RC have also worked in the committee, which comments and prepares hydrobiological study standards of the European Committee of Standardisation (CEN). The leader of the RC is the chairman of the Finnish Limnological Society.

• Ways to strengthen the societal impact of the RC’s research and doctoral training.

The main problem with societal impact of the studies has been that the appreciation of such impact by the scientific community has been low compared e.g. with peer-reviewed papers. It is therefore delightful that the societal impact seems to get more weight in the future, which gives even better motivation for such work. In FRESH, the societal impact had an important role during the evaluation
period, but in the future, the RC aims to strengthen the impact by intensifying the collaboration with the 3rd sector (e.g. joint applications), and including courses with societal aspect in doctoral studies, such as courses on environmental policy and decision making.

Description of the RC’s research collaborations and joint doctoral training activities and how the RC has promoted researcher mobility.

The research in FRESH is highly international. Numerous research projects include international collaboration in research applications, data collection (both field studies and experimental work) and publications. International projects during the evaluation period included, for instance, the studies on the adaptive radiation of Fennoscandian whitefish together with University of Tromsø, Norway (Kahilainen et al. 2011), experimental studies on the refuge effect of clay turbidity together with Max Planck Institute for Limnology, Germany (Liljendahl-Nurminen et al. 2008), studies on similarity of biological communities together with Harvard University, USA and University of Cologne, Germany (Soininen et al. 2007), and the ongoing Big River project led by A. Vähätalo, including collaboration with c. 20 foreign researchers from almost all continents. The internationality is reflected in the publication list in the variety of co-authors from foreign research institutes.

The RC has promoted international research mobility by encouraging research visits by Ph. D. students and post doc researchers and providing funds for research visits. During the evaluation period, research visits from FRESH have been made e.g. to Max Planck Institute for Limnology, Plön, Germany (A. Liljendahl-Nurminen), National Environment Research Institute, Silkeborg, Denmark (Z. Pekcan-Hekim), University of Cologne, Germany (J. Soininen). Visits from other institutes during the evaluation period to the RC have been made e.g. from Tongji University, College of Environmental Science & Engineering, China, University of Tartu, Estonia and University of Montpellier, France. During the evaluation period, the RC has had joint doctoral training activities with the University of Stockholm (Sweden) and University of Tartu (Estonia).

National collaboration is also intensive. Important national collaborators and co-authors include, for instance, Finnish Game and Fisheries Research Institute, Finnish Environment Institute, Finnish Meteorological Institute, Helsinki University of Technology, University of Jyväskylä, and University of Oulu. The collaboration includes joint research applications and funding, co-operation in data collection, publication, as well as use of research facilities. For instance, the Sustainable Fishing project led by H. Lehtonen, and Lake Vesijärvi studies on artificial aeration led by J. Horppila include joint applications and shared funding with Finnish Game and Fisheries Research Institute. Within the University of Helsinki, collaboration is intensive with the Lammi Biological Station, Tvarminne Zoological Station, Kilpisjärvi Biological Station, Muddusjärvi Research Station and Faculty of Agriculture and Forestry. For instance, the laboratory facilities of the field stations are frequently used for experimental work. Additionally, in numerous management-related projects the RC collaborates with various local authorities; typically with environmental authorities of cities and municipalities.

RC’s strengths and challenges related to research collaboration and researcher mobility, and the actions planned for their development.

The research by FRESH has been international and research mobility has been intensive. In the future, however, the RC aims to strengthen the national and international co-operation by increasing the number of joint applications with national and foreign institutes, including EU-funding). This development has already started. For instance, a large project (2010-2013) was started together with
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Middle East Technical University (Ankara, Turkey) and National University of Mar del Plata (Argentina). Numerous joint research applications with organisations in Finland and abroad are under evaluation. These include, for instance, Finnish Environment Institute, the German Research Foundation, Institute of Hydrobiology, Biology Center of ASCR, (Czech Republic), National Natural Science Foundation of China and University of Montevideo, (Uruguay). Together with joint projects, the frequency of research visits will increase. For 2011-2013, numerous visits from foreign institutes (e.g. France, Turkey, China) to FRESH have been confirmed and funding for several other visits have been applied.

5 OPERATIONAL CONDITIONS (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the operational conditions in the RC’s research environment (e.g. research infrastructure, balance between research and teaching duties).

The majority of the FRESH group is situated in Viikki campus, which is one of the largest concentrations of biosciences in the world, providing all the needed workspace, laboratories, facilities for experimental work, and administration services. The group has the access to all the facilities of the host department (Dpt. of Environmental Sciences), which has excellent laboratory facilities (e.g. the best laboratory facilities to conduct diatom analyses in Finland, updated waterchemistry facilities, aquaria for experimental work) and field equipment (e.g. up to date multiparameter sondes, radiometers and turbulence meters). Additionally, the RC uses the other facilities in the Viikki campus, including those of Dpt of Biosciences (genetic laboratory), Institute of Biotechnology (laboratory services for molecular fingerprinting of aquatic bacteria) and Faculty of Agriculture and Forestry. The RC is also situated in the Environmental Campus in Lahti, which includes the AlmaLab, offering facilities for versatile chemical, biological and microbiological analyses, as well as experimental work.

Due to the use of the field stations situated in the different parts of Finland, the RC has also geographically excellent opportunities for research and doctoral training. The RC uses the facilities of the different field stations of the University of Helsinki: Tvärminne Zoological Station is situated in the southern coast of Finland. For instance, laboratory experiments on sediment resuspension and studies on coastal fish populations have been conducted in the Tvärminne station by the RC. Lammi Biological Station is situated in the lake district of central Finland and provides facilities for numerous lake studies and analyses and well as accommodation for researchers. For instance, the RC’s studies on chemical and biological decomposition of DOC are concentrated in Lammi. Kipisjärvi Biological Station and Muddusjärvi Research Station are located in the northern Finland and provide excellent facilities for studies on subarctic watercourses (e.g. experimental and field studies on northern fish populations). Additionally, the RC frequently uses the facilities of the Evo field station of the Finnish Game and Fisheries Research Institute (e.g. laboratory experiments on the effects of humic water on predator-prey interactions, field studies on forest lakes). Joint use of research equipment with Finnish Environmental Institute and with many regional authorities (e.g. with City of Lahti in Lake Vesijärvi research) is also frequent.

Among the members of the RC, the teaching duties and administrational obligations are heaviest for the professors and university lecturers. During the terms, their time is mostly allocated for teaching, administration, and preparing research applications. Principal investigators working under external funding, as well as PhD students have less duties and can allocate their time mostly for research. For them, the maximum percentage allocated for teaching is 80 h annually (if requested by the host department), but usually the actual teaching duty is less than that. By participating in teaching, PhD students will benefit their leading and supervision skills necessary in their future role as group leaders.
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- RC’s strengths and challenges related to operational conditions, and the actions planned for their development.

The strengths of the operational conditions of the RC include the wide possibilities to use facilities of numerous research institutes. Joint use of research equipment reduces the costs allocated to equipment. The facilities of the field stations offer great chances for research of various aquatic ecosystems. The challenges related to operational conditions are connected especially to special equipment not available or needed for so frequent use that joint use with other institutes is difficult. Attempts to collect funds for development of such equipment are being annually made according to the requirements of research projects and the RC is frequently negotiating with the department administration concerning equipment budget. In 2010, for instance, a modern 10 Hz SonTek ADV HYDRA turbulence measurement system was provided for studies connected to the climate change. Already confirmed (2011) are also the provision of a TrueSpec MICRO CHNS-analysator, valuable e.g. for studies on carbon cycling and an UNISENSE microsensor multimeter for sediment studies.

- Description of the execution and processes of leadership in the RC, how the management-related responsibilities and roles are distributed in the RC and how the leadership- and management-related processes support high quality research, collaboration between principal investigators and other researchers in the RC, the RC’s research focus and strengthening of the RC’s know-how.

The variety of study subjects in FRESH is wide. Therefore, it has been reasonable to distribute the responsibility and the leadership of the various studies to the principal investigators of the RC according to their expertise. Such sub-groups include, for instance, the Aquatic Community Ecology group led by J. Soininen [http://www.helsinki.fi/aquaticecology/index.htm], the Photochemistry group led by A. Vähätalo [http://www.helsinki.fi/environmentalphotochemistry/], the Lake Ecosystem Dynamics group by J. Horppila [http://www.helsinki.fi/lakedynamics], the Sustainable Fishing group by H. Lehtonen [http://www.helsinki.fi/keskala/], and Fish Ecology group by K. Kahilainen [http://www.helsinki.fi/ymparistotieteet/english/research/whitefish.html]. Within each group, the responsibilities are allocated between post doc researchers and Ph. D. students according to the requirements of the different research projects. Each member of the team is given clear description of their responsibilities and goals, and these are updated whenever necessary. Collaboration among principal investigators and other researchers in the RC is daily and the principal investigators participate at all stages of research. Such organization facilitates efficient research work, as the expertise of each member of the RC is allocated reasonably. The organization does not, however, lead to isolated sub-groups but collaboration and exchange of information between principal investigators is frequent, as indicated by the number of joint publications. The group leaders have regular meetings for coordination of the studies and allocation of resources (equipment, person hours of work) between the different projects. Researchers commonly participate in studies of several projects in data collection and in publication. The research results are presented and discussed e.g. in the Aquatic Sciences seminar arranged fortnightly by the RC. Funding applications are planned jointly to coordinate the different projects in relation to the focus of the RC’s research.

- RC’s strengths and challenges related to leadership and management, and the actions planned for developing the processes.

A strength in the leadership of the RC has been that the distribution of responsibilities has been very balanced, facilitating the efficient use of the expertise of all researchers. In the future, a challenge is to combine the expertise of the researchers of the RC for even larger applications (European Research
Council, Academy of Finland). To achieve this, for instance, during 2011-2013 FRESH will prepare an application for a Centre of Excellence of the Academy of Finland.

### 7 External Competitive Funding of the RC

- **Listing of the RCs external competitive funding, where:**
  - the funding decisions have been made during 1.1.2005-31.12.2010, and
  - the administrator of the funding is/has been the University of Helsinki

- **Academy of Finland (AF)** - total amount of funding (in euros) AF has decided to allocate to the RC members during 1.1.2005-31.12.2010: **3440000**

- **Finnish Funding Agency for Technology and Innovation (TEKES)** - total amount of funding (in euros) TEKES has decided to allocate to the RC members during 1.1.2005-31.12.2010:

- **European Union (EU)** - total amount of funding (in euros) EU has decided to allocate to the RC members during 1.1.2005-31.12.2010:

- **European Research Council (ERC)** - total amount of funding (in euros) ERC has decided to allocate to the RC members during 1.1.2005-31.12.2010:

- **International and national foundations** – names of international and national foundations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
  - names of the foundations: Bror Serlachius Foundation, Maa- ja Vesiteknikian Tuki, Maj and Tor Nessling Foundation, Kone Foundation, Lake Vesijärvi Foundation
  - total amount of funding (in euros) from the above-mentioned foundations: **1145000**

- **Other international funding** - names of other international funding organizations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
  - names of the funding organizations: State Key Laboratory of Lake Science and Environment, China
  - total amount of funding (in euros) from the above-mentioned funding organizations: **10000**

- **Other national funding** (incl. EVO funding and Ministry of Education and Culture funded doctoral programme positions) - names of other national funding organizations which have decided to allocate funding to the RC members during 1.1.2005-31.12.2010, and the amount of their funding (in euros).
  - names of the funding organizations: Ministry of Agriculture and Forestry, 3-year research grants of University of Helsinki, Helsinki University Centre for Environment, Uusimaa Centre for Economic Development, Transport and the Environment, Metsähallitus, Vantaanjoki Fisheries District, Tammela Fisheries District, Lohjanjärvi Fisheries District, Espoo-Manki Fisheries District, Water and Environment of Western South Finland (registered association), Finnish Game and Fisheries Research Institute, The City of Lahti, The City of Espoo, The City of Salo, The City of Hyvinkää, The City of Lohja, numerous different municipalities and Water Protection associations
  - total amount of funding (in euros) from the above-mentioned funding organizations: **775000**

- **Total amount of external funding allocated to the RC members during 1.1.2005-31.12.2010:** **9250000** euros
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8 RC’S STRATEGIC ACTION PLAN FOR 2011–2013 (MAX. 4400 CHARACTERS WITH SPACES)

- Description of the RC’s future perspectives in respect to research and doctoral training.

In 2011-2013, the volume and quality of research and doctoral training in the RC will be improved. Increase in volume will be achieved with already allocated funding for research. In the RC, the funding for several projects extending to 2013 has been granted and numerous new projects are starting in 2011. Funding is also evenly distributed to the various focus areas and PI’s within the group. Projects running during 2011-2013 include "Climate change, light, turbulence and top-down control in aquatic ecosystems (2010-2013, financed by the Academy of Finland and led by J. Horppila), "Management of lake ecosystems in the changing environment - re-evaluation of the effects of artificial aeration” (2011-2013, financed by Maj and Tor Nessling Foundation, led by J. Horppila), Sustainable Fishing (2005-2014, financed by Bror Serlachius Foundation, led by H. Lehtonen), "The effect of climate change on the growth and reproduction potential of fish” (2011-2013, financed by the research grants of University of Helsinki, led by L. Nurminen), "The transport of photosynthetic carbon from the catchment to the river deltas” (2011-2014, financed by the Academy of Finland, led by A. Ojala), "Diversity and distribution of unicellular vs multicellular aquatic organisms” (2010-2015, financed by the Academy of Finland, led by J. Soininen) and "Impacts of climate change on food web structure, top consumer production, and fisheries yields (2011-2014, financed by the Academy of Finland, led by K. Kahilainen). These allocated research grants will also increase the number of doctoral dissertation in future. At the moment, several Ph. D. theses are at their final stages and during 2011-2013 a minimum of 6 dissertations will take place in the RC (S. Estlander, H. Holmoos, J. Huotari, J. Kaitaranta, J. Korhonen, L. Virtanen). Together with the new larger and more international projects, the quality of research and doctoral training will improve as they facilitate collection, combination and publication of more comprehensive datasets. During the next three-year period, FRESH also prepares applications for the European Research Council and Academy of Finland for the Centre of Excellence in research. These large consortium projects will enhance effective research networks, which are of fundamental importance to publish in the top journals (Nature, Science, PNAS).

9 SHORT DESCRIPTION OF HOW THE RC MEMBERS HAVE CONTRIBUTED TO THE COMPILATION OF THE STAGE 2 MATERIALS (MAX. 1100 CHARACTERS WITH SPACES).

The members of the RC were responsible for introducing their data into the TUHAT-database. Additionally, the PI’s of the group collected the information (e.g. funding, detailed project information) necessary for the stage 2 e-form and based on the provided information the leader of the RC produced the texts in the form. The texts were checked and commented by the group members before submission.
FRESH/Horppila

1 Analysis of publications

<table>
<thead>
<tr>
<th>Publication type</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Total Count 2005 - 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 Refereed journal article</td>
<td>37</td>
<td>19</td>
<td>16</td>
<td>13</td>
<td>21</td>
<td>26</td>
<td>132</td>
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<tr>
<td>A2 Review in scientific journal</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>A3 Contribution to book/other compilations (refereed)</td>
<td>2</td>
<td>35</td>
<td>36</td>
<td>1</td>
<td></td>
<td></td>
<td>74</td>
</tr>
<tr>
<td>A4 Article in conference publication (refereed)</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>B1 Unrefereed journal article</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>B2 Contribution to book/other compilations (non-refereed)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>B3 Unrefereed article in conference proceedings</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>15</td>
</tr>
<tr>
<td>C1 Published scientific monograph</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
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<td>6</td>
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<tr>
<td>C2 Edited book, compilation, conference proceeding or special issue of journal</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>D1 Article in professional journal</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>D2 Article in professional hand or guide book or in a professional data system, or test book material</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>D4 Published development or research report</td>
<td>3</td>
<td>7</td>
<td>7</td>
<td>9</td>
<td>6</td>
<td>11</td>
<td>43</td>
</tr>
<tr>
<td>D5 Text book or professional handbook or guidebook or dictionary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>E1 Popular article, newspaper article</td>
<td>28</td>
<td>9</td>
<td>7</td>
<td>10</td>
<td>5</td>
<td>9</td>
<td>68</td>
</tr>
<tr>
<td>E1 Popular contribution to book/other compilations</td>
<td>7</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15</td>
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<tr>
<td>E2 Popular monograph</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
2 Listing of publications

A1 Refereed journal article

2005
Horppila, J, Vinni, M 2005, 'Diurnal variations in the diet composition of three fish species showing different feeding habits, and consequences on food consumption estimates', Archiv für Hydrobiologie Special Issues Advances in Limnology , pp. 189-205.
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

FRESH/Horppila


2007


2008


2009


2010


INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

FRESH/Horppila


Nykanen, M, Malinen, T, Vallikainen, K, Liukkonen, M, Kairesalo, T 2010, ‘Cladoceran community responses to biomanzipulation and re-oxygenation in Lake Vesijärvi, Finland, as inferred from remains in annually laminated sediment’, Freshwater Biology, vol 55, no. 6, pp. 1164-1181.


A2 Review in scientific journal

2007


A3 Contribution to book/other compilations (referred)

2005

FRESH/Horppila


2006

INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILEDS OF PUBLICATIONS DATA 2005-2010

FRESH/Horppila

2007
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RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

FRESH/Horppila

A4 Article in conference publication (refereed)

2005


2007

B1 Unrefereed journal article

2006

2009

B2 Contribution to book/other compilations (non-refereed)

2009

B3 Unrefereed article in conference proceedings

2005

2006

Lappalainen, J. 2006, Spatial patterns of pikeperch cannibalism.,


2007
Lappalainen, J., Matinen, T., Vinni, M., Mlardi, M., Tuomaala, A. 2007, Slow growth of pikeperch (Sander lucioperca) in a small lake in southern Finland: possible reasons and reflections to life history.,

2008
Lappalainen, J., Harrod, C., Graham, C. 2008, Possible effects of climate change on flounder (Platichthys flesus): a review.,

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RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

FRESH/Horppila


2009

Lappalainen, J, Vinni, M, Malinen, TT 2009. Pike stocking as a tool in lake biomanipulation...

Milardi, M, Lappalainen, J, Malinen, TT, Veni, M, Ruuhijärvi, J 2009. Sexual dimorphism in growth and length-at-maturity of pikeperch (Sander lucioperca) in a slow growing population in Lake Saimaa...


2010


C1 Published scientific monograph

2006


2007


2008

Urho, L, Lehtonen, H 2008. Fish species in Finland: Riiusta- ja kalatalous, Selvityksiä, no. 1B, Finnish Game and Fisheries Research Institute, Helsinki.


2009

C2 Edited book, compilation, conference proceeding or special issue of journal

2005

D1 Article in professional journal

2005

2006


2006

D2 Article in professional hand or guide book or in a professional data system, or text book material

2005

2006

2008

D4 Published development or research report

2005


2006
Kahilainen, K, Lehtonen, H 2006, Tunturikesien kalat ja ympäristön muutos, Ministry of Agriculture and Forestry.

INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

FRESH/Horppila


2007


2008


2009

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RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010

FRESH/Horppila


E1 Popular article, newspaper article

2005


2008


D5 Text book or professional handbook or guidebook or dictionary

2008

Lehtonen, H 2005, 'Kalanistutusten tulisi olla erikoismenetelmä, ei yleistyökalu', Suomen luonto, vol 64, no. 4, pp. 52.
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF PUBLICATIONS DATA 2005-2010


E1 Popular contribution to book/other compilations


2006

2007

E2 Popular monograph

2006
Lehtonen, H 2006, Suomalainen kalastus, WSOY, Helsinki.

2007
1 Analysis of activities 2005-2010


<table>
<thead>
<tr>
<th>Activity type</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisor or co-supervisor of doctoral thesis</td>
<td>20</td>
</tr>
<tr>
<td>Editor of research journal</td>
<td>61</td>
</tr>
<tr>
<td>Peer review of manuscripts</td>
<td>111</td>
</tr>
<tr>
<td>Assessment of candidates for academic posts</td>
<td>5</td>
</tr>
<tr>
<td>Membership or other role in review committee</td>
<td>8</td>
</tr>
<tr>
<td>Membership or other role in research network</td>
<td>2</td>
</tr>
<tr>
<td>Membership or other role in national/international committee, council, board</td>
<td>29</td>
</tr>
<tr>
<td>Membership or other role in public Finnish or international organization</td>
<td>36</td>
</tr>
<tr>
<td>Membership or other role of body in private company/organisation</td>
<td>16</td>
</tr>
<tr>
<td>Participation in interview for written media</td>
<td>25</td>
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<tr>
<td>Participation in radio programme</td>
<td>14</td>
</tr>
<tr>
<td>Participation in TV programme</td>
<td>5</td>
</tr>
<tr>
<td>Participation in interview for web based media</td>
<td>3</td>
</tr>
</tbody>
</table>
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

FRESH/Horppila

2 Listing of activities 2005-2010

Supervisor or co-supervisor of doctoral thesis

Jukka Horppila


Hannu Lehtonen


Leena Nurminen

Väitöskirjan ohjaus, Leena Nurminen, 2006 → 2011
Väitöskirjan ohjaus, Leena Nurminen, 2009 → 2013
Väitöskirjan ohjaus, Leena Nurminen, 2010 → 2014

Janne Soininen

Väitöskirjan ohjaus, Janne Soininen, 01.01.2008 → ...
Väitöskirjan ohjaus, Janne Soininen, 01.03.2010 → ...
Väitöskirjan ohjaus, Janne Soininen, 2010 → ..., Sweden

Anne Ojala

Jessica Lopez Bellidon väitöskirjatyön ohjaaja, Anne Ojala, 2003 → 2011
Antti Rissasen väitöskirjatyön ohjaus, Anne Ojala, 2008 → 2011
Elina Peltomaan väitöskirjatyön ohjaus, Anne Ojala, 2008 → 2012
Jussi Huotarin väitöskirjatyön ohjaaja, Anne Ojala, 2008 → 2011
Tertti Raslon väitöskirjatyön ohjaus, Anne Ojala, 2008 → 2011

Editor of research journal

Jukka Horppila

Water Research, Jukka Horppila, 01.01.2005 → 31.12.2005, United States
* Freshwater Biology, Jukka Horppila, 01.01.2006 → 31.12.2006
Aquatic Sciences, Jukka Horppila, 01.01.2006 → 31.12.2006
Fisheries Management and Ecology, Jukka Horppila, 01.01.2007 → 31.12.2007
Fresenius Environmental Bulletin, Jukka Horppila, 01.01.2007 → 31.12.2007

Kimmo Kahilainen

Archiv für Hydrobiologie, Kimmo Kahilainen, 01.01.2005 → 31.12.2005, Germany
Ecology of Freshwater Fish, Kimmo Kahilainen, 01.01.2005 → 31.12.2005, Spain
Journal of Fish Biology, Kimmo Kahilainen, 01.01.2005 → 31.12.2005, United Kingdom
Biological Invasions, Kimmo Kahilainen, 01.01.2007 → 31.12.2007
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

FRESH/Horppila

Environmental Biology of Fishes, Kimmo Kahilainen, 01.01.2007 → 31.12.2007
Hydrobiologia, Kimmo Kahilainen, 01.01.2007 → 31.12.2007

Hannu Lehtonen

Bulletin of the Sea Fisheries Institute, Hannu Lehtonen, 01.01.2005 → 31.12.2005, Poland
Bulletin of the Sea Fisheries Institute, Hannu Lehtonen, 01.01.2005 → 31.12.2005, Poland
Fisheries Management and Ecology, Hannu Lehtonen, 01.01.2005 → 31.12.2005, United Kingdom
Journal of Fish Biology, Hannu Lehtonen, 01.01.2005 → 31.12.2006, United Kingdom
Aquatic Ecosystem Health and Management, Hannu Lehtonen, 01.01.2006 → 31.12.2006, Canada
Aquatic Toxicology, Hannu Lehtonen, 01.01.2006 → 31.12.2006
Bulletin of the Sea Fisheries Institute, Hannu Lehtonen, 01.01.2006 → 31.12.2006, Poland
Bulletin of the Sea Fisheries Institute, Hannu Lehtonen, 01.01.2006 → 31.12.2006, Poland
Fisheries Management and Ecology, Hannu Lehtonen, 01.01.2006 → 31.12.2006, United Kingdom
Oecologia, Hannu Lehtonen, 01.01.2006 → 31.12.2006
Aquatic Toxicology, Hannu Lehtonen, 01.01.2007 → 31.12.2007
Bulletin of the Sea Fisheries Institute, Hannu Lehtonen, 01.01.2007 → 31.12.2007, Poland
Bulletin of the Sea Fisheries Institute, Hannu Lehtonen, 01.01.2007 → 31.12.2007, Poland
Fisheries Management and Ecology, Hannu Lehtonen, 01.01.2007 → 31.12.2007, United Kingdom
Fisheries Research, Hannu Lehtonen, 01.01.2007 → 31.12.2007
Nordic Journal of Freshwater Research, Hannu Lehtonen, 01.01.2007 → 31.12.2007, Sweden
Aquatic Ecology, Hannu Lehtonen, 01.01.2008 → 31.12.2008, Netherlands
Bulletin of the Sea Fisheries Institute, Hannu Lehtonen, 01.01.2008 → 31.12.2008, Poland
Bulletin of the Sea Fisheries Institute, Hannu Lehtonen, 01.01.2008 → 31.12.2008, Poland
Fisheries Management and Ecology, Hannu Lehtonen, 01.01.2008 → 31.12.2008, United Kingdom
Journal of Fish Biology, Hannu Lehtonen, 01.01.2008 → 31.12.2008, United Kingdom

Janne Soininen

Toimittaja, Journal of Applied Phycology, Janne Soininen, 2006 → …
Southeastern Naturalist, Janne Soininen, 01.01.2008 → 31.12.2008, United States

Anssi Vähätalo

Aquatic Sciences, Anssi Vähätalo, 01.01.2005 → 31.12.2005, Switzerland
Oris Fennica, Anssi Vähätalo, 01.01.2005 → 31.12.2005, Finland
Aquatic Microbial Ecology, Anssi Vähätalo, 01.01.2006 → 31.12.2006
Biodegradation, Anssi Vähätalo, 01.01.2006 → 31.12.2006
Biogeochemistry, Anssi Vähätalo, 01.01.2006 → 31.12.2006

3
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RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

FRESH/Horppila

Environmental Science and Technology, Anssi Vähätalo, 01.01.2006 → 31.12.2006
Marine Chemistry, Anssi Vähätalo, 01.01.2006 → 31.12.2006
Microbial Ecology, Anssi Vähätalo, 01.01.2006 → 31.12.2006
Aquatic Sciences, Anssi Vähätalo, 01.01.2007 → 31.12.2007
Archiv für Hydrobiologie, Anssi Vähätalo, 01.01.2007 → 31.12.2007
Boreal Environment Research, Anssi Vähätalo, 01.01.2007 → 31.12.2007
Climate Research, Anssi Vähätalo, 01.01.2007 → 31.12.2007
FEMS Microbiology Ecology, Anssi Vähätalo, 01.01.2007 → 31.12.2007
Limnology and Oceanography, Anssi Vähätalo, 01.01.2007 → 31.12.2007
Estuaries and Coasts, Anssi Vähätalo, 01.01.2008 → 31.12.2008
Hydrobiologia, Anssi Vähätalo, 01.01.2008 → 31.12.2008
Organic Geochemistry, Anssi Vähätalo, 01.01.2008 → 31.12.2008

Peer review of manuscripts

Jukka Horppila
A review of a manuscript submitted to Aquatic Ecology, Jukka Horppila, 12.11.2005 → 16.11.2005
A review of a manuscript submitted to Hydrobiologia, Jukka Horppila, 15.11.2005 → 22.11.2005
A review of a manuscript submitted to Limnology and Oceanography, Jukka Horppila, 02.09.2005 → 10.09.2005
A review of a manuscript submitted to Aquatic Sciences, Jukka Horppila, 10.09.2006 → 11.09.2006
A review of a manuscript submitted to Freshwater Biology, Jukka Horppila, 18.08.2006 → 20.08.2006
A review of a manuscript submitted to Freshwater Biology, Jukka Horppila, 25.10.2006 → 29.10.2006
A review of a manuscript submitted to Fisheries Management and Ecology, Jukka Horppila, 04.11.2007 → 08.11.2007
A review of a manuscript submitted to Fresenius Environmental Bulletin, Jukka Horppila, 08.02.2007 → 12.02.2008
A review of a manuscript submitted to Aquatic Ecology, Jukka Horppila, 10.11.2008 → 22.11.2008
A review of a manuscript submitted to Freshwater Biology, Jukka Horppila, 27.06.2008 → 30.06.2008
A review of a manuscript submitted to Freshwater Biology, Jukka Horppila, 01.12.2008 → 08.12.2008
A review of a manuscript submitted to Fundamental and Applied Limnology, Jukka Horppila, 20.05.2008 → 28.05.2008
A review of a manuscript submitted to Fundamental and Applied Limnology, Jukka Horppila, 17.05.2008 → 19.05.2008
A review of a manuscript submitted to International Review of Hydrobiology, Jukka Horppila, 17.06.2008 → 24.06.2008
A review of a manuscript submitted to Ecology of Freshwater Fish, Jukka Horppila, 15.08.2009 → 02.09.2009
A review of a manuscript submitted to Oecologia, Jukka Horppila, 18.01.2010 → 20.01.2010, Germany
A review of a manuscript submitted to Freshwater Biology, Jukka Horppila, 25.03.2010 → 25.07.2010, United Kingdom

Kimmo Kahilainen
Annals Zoologi Fennici, Kimmo Kahilainen, 11.2002 → …
Journal of Fish Biology, Kimmo Kahilainen, 08.2004 → …
Archiv für Hydrobiologie, Kimmo Kahilainen, 11.2005 → …
Ecology of Freshwater Fish, Kimmo Kahilainen, 12.2005 → …
Environmental Biology of Fishes, Kimmo Kahilainen, 12.2006 → …
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

FRESH/Horppila

Biological Invasions, Kimmo Kahilainen, 04.2007 → ...
Canadian Journal of Zoology, Kimmo Kahilainen, 05.2008 → ...
Aquatic Conservation: Marine and Freshwater Ecosystems, Kimmo Kahilainen, 10.2009 → ...
Fisheries Management and Ecology, Kimmo Kahilainen, 10.2009 → ...
Hydrobiologia, Kimmo Kahilainen, 07.2009 → ...
Rapid Communications in Mass Spectrometry, Kimmo Kahilainen, 04.2009 → ...
Current Zoology, Kimmo Kahilainen, 12.2010 → ...
Evolutionary Ecology, Kimmo Kahilainen, 06.2010 → ...
Marine Biology, Kimmo Kahilainen, 03.2010 → ...
Molecular Ecology, Kimmo Kahilainen, 05.2010 → ...

Jyrki Lappalainen ,
Reviewer: Canadian Journal of Fisheries and Aquatic Sciences, Jyrki Lappalainen, 2006
Reviewer: Global Change Biology, Jyrki Lappalainen, 2006
Reviewer: Hydrobiologia, Jyrki Lappalainen, 2006
Reviewer: Boreal Environment Research, Jyrki Lappalainen, 2008
Reviewer: Journal of Applied Ichthyology, Jyrki Lappalainen, 2008
Reviewer: OIKOS, Jyrki Lappalainen, 2008
Reviewer: Ecology of Freshwater Fish, Jyrki Lappalainen, 2009
Reviewer: Hydrobiologia, Jyrki Lappalainen, 2009
Reviewer: Journal of Fish Biology, Jyrki Lappalainen, 2009
Reviewer: OIKOS, Jyrki Lappalainen, 2009
Reviewer: Ecology of Freshwater Fish, Jyrki Lappalainen, 2010
Reviewer: Fundamental & Applied Limnology, Jyrki Lappalainen, 2010
Reviewer: Hydrobiologia, Jyrki Lappalainen, 2010
Reviewer: Journal of Fish Biology, Jyrki Lappalainen, 2010

Anne Liljendahl ,
Reviewer of Journal of Plankton Research, Anne Liljendahl, 2010

Tommi Tapani Malinen ,
Reviewer in Fisheries Research, Tommi Tapani Malinen, 30.10.2007 → 22.11.2007
Reviewer in Aquatic Living Resources, Tommi Tapani Malinen, 2008 → 2009
Reviewer in Canadian Journal of Fisheries and Aquatic Sciences, Tommi Tapani Malinen, 2008 → 2009

Leena Numminen ,
Effects of Hydrilla verticillata on phosphorus retention and release in sediments, Leena Numminen, 2006
Effects of species and biomass levels of submerged vegetation on sediment resuspension and, Leena Numminen, 2006
Interactions between macrophytes and water quality in a heavily affected shallow urban lake of, Leena Numminen, 2006
Ecophysiological responses of five common hydrophytes in the Rhône, Leena Numminen, 2008
Effect of temperature and group size on swimming speed and capture rate of perch Perca, Leena Numminen, 2009
Implications of Macrophytes in the Control of Cyanobacterial Blooms in East Lake Taihu, China, Leena Numminen, 2009
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING AT THE UNIVERSITY OF HELSINKI

RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

FRESH/Horppila

Nuphar lutea (L.) Sm. a structuring factor of macrozoobenthos and selected abiotic parameters, Leena Nurminen, 2009

Janne Soininen, Analytica Chimica Acta, Janne Soininen, 2006 → ...
Ecography, Janne Soininen, 2006 → ...
Ecology, Janne Soininen, 2006 → ...
Freshwater Biology, Janne Soininen, 2006 → ...
Hydrobiologia, Janne Soininen, 2006 → ...
Journal of Applied Ecology, Janne Soininen, 2006 → ...
Journal of the North American Benthological Society, Janne Soininen, 2006 → ...
Oikos, Janne Soininen, 2006 → ...
Ecology, Janne Soininen, 2006 → ...
Global Change Biology, Janne Soininen, 2007 → ...
Journal of Biogeography, Janne Soininen, 2007 → ...
Journal of Phycology, Janne Soininen, 2007 → ...
Journal of Plankton Research, Janne Soininen, 2007 → ...
Ecology, Janne Soininen, 2007 → ...
Science of the Total Environment, Janne Soininen, 2007 → ...
Applied Vegetation Science, Janne Soininen, 2008 → ...
Austral Ecology, Janne Soininen, 2008 → ...
Ecological Applications, Janne Soininen, 2008 → ...
Ecology Letters, Janne Soininen, 2008 → ...
European Journal of Phycology, Janne Soininen, 2008 → ...
Global Ecology and Biogeography, Janne Soininen, 2008 → ...
Journal of Vegetation Science, Janne Soininen, 2008 → ...
Landscape Ecology, Janne Soininen, 2008 → ...
Marine Biology, Janne Soininen, 2008 → ...
Population Ecology, Janne Soininen, 2008 → ...
Basic and Applied Ecology, Janne Soininen, 2009 → ...
Boreal Environment Research, Janne Soininen, 2009 → ...
Environmental Monitoring and Assessment, Janne Soininen, 2009 → ...
Fundamental and Applied Limnology, Janne Soininen, 2009 → ...
Marine Ecology Progress Series, Janne Soininen, 2009 → ...
Microbial Ecology, Janne Soininen, 2009 → ...
PNAS, Janne Soininen, 2009 → ...
Ecosphere, Janne Soininen, 2010 → ...
ISME Journal, Janne Soininen, 2010 → ...
Polar Research, Janne Soininen, 2010 → ...

Anne Ojala
Suurjärven seminaari 2010 (Muuttuva ilmasto - muuttuvat vesistöt ja yhteiskunta) -kongressijulkaisun refieree-arviointi, Anne Ojala, 2010 → ...

Mikko Olin
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Manuscript Reviewing, Mikko Olin, 06.05.2005
Manuscript Reviewing, Mikko Olin, 17.10.2005
Marine and Freshwater Research, Mikko Olin, 09.05.2005 → 31.12.2005, Australia
Manuscript Reviewing, Mikko Olin, 13.07.2007
Manuscript Reviewing, Mikko Olin, 17.01.2008
Manuscript reviewing, Mikko Olin, 16.11.2009
Manuscript reviewing, Mikko Olin, 27.06.2010

Assessment of candidates for academic posts
Jukka Horppila,
Assessment of the qualification of an applicant for a docentship, Jukka Horppila, 20.04.2009, Finland
Membership in the committee that evaluates the qualifications of the applicants for the professorship in Environmental Research in the Lammi Biological Station, Jukka Horppila, 2009 → …
Assessment of the qualification of an applicant for a docentship, Jukka Horppila, 05.01.2010
Assessment of the qualification of an applicant for a docentship, Jukka Horppila, 05.05.2010, Finland
Assessment of the qualification of an applicant for a docentship, Jukka Horppila, 31.12.2010, Finland

Membership or other role in review committee
Jukka Horppila,
A membership in the expert circle of the Academy of Finland, Jukka Horppila, 2005 → …, Finland
Evaluation of a research application for the Israel Science Foundation, Jukka Horppila, 2005 → …, Israel
The evaluation of the plan for the Baltic Sea Research programme of Finnish Game and Fisheries Research Institute, Jukka Horppila, 15.08.2010 → 15.09.2010, Finland

Hannu Lehtonen,
Professorin tehtävän täyttävän täytäntöönpanotyöryhmän jäsen, Hannu Lehtonen, 01.01.2010 → 12.03.2010, Finland
Väitöskirjan esitarkastus, Hannu Lehtonen, 06.04.2010, Egypt

Anne Ojala,
Darwin Center for Biodiversity, Anne Ojala, 2010 → …, Netherlands
Formas Climate Panel, Anne Ojala, 2010 → …, Sweden
Helsingin yliopiston biologian ja ympäristöteknologian tiedekunnan opettajatoimikunnan jäsen, Anne Ojala, 2010 → …

Membership or other role in research network
Anne Liljendahl,
Member of the board, Anne Liljendahl, 2009, Finland
Anne Ojala,
Päijät-Hämeen Vesijärveläisten neuvonantajaryhmän, Anne Ojala, 2010 → …
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Membership or other role in national/international committee, council, board

Jukka Horppila,
Membership of the work group (coordinated by Finnish Environment Institute) which comments and prepares hydrobiological study standards of the European Committee of Standardisation (CEN), Jukka Horppila, 2006 → 2008
Acting as a vice-chairman of the Finnish Limnological Society, Jukka Horppila, 2007 → 2010, Finland
Biologisten vestutuskeskuksen standardisoite- ja tarkastustyöryhmä (SYKE), Jukka Horppila, 01.01.2007 → 31.12.2007, Finland
A membership in the steering committee of a Lake Restoration guide published by Finnish Environment Institute to, Jukka Horppila, 2009 → ...
Membership in the follow up group of the VALUE Doctoral Program, Jukka Horppila, 2009 → ..., Finland
A membership in the scientific advisory group of the Lake Vesijärvi Foundation, Jukka Horppila, 01.01.2010 → 31.12.2010, Finland
Acting as a chairman of the Finnish Limnological Society, Jukka Horppila, 25.02.2010 → 25.02.2013, Finland

Hannu Lehtonen,
EIFAC working group "Methodologies for rehabilitation of Lakes and Reservoirs, Hannu Lehtonen, 01.01.2005 → 31.12.2005
EIFAC working group "Methodologies for rehabilitation of Lakes and Reservoirs, Hannu Lehtonen, 01.01.2006 → 31.12.2006
First International Symposium of Winter Limnology, Hannu Lehtonen, 01.01.2007 → 31.12.2007
Methodologies for rehabilitation of Lakes and Reservoirs, Hannu Lehtonen, 01.01.2007 → 31.12.2007
EIFAC working group "Methodologies for rehabilitation of Lakes and Reservoirs, Hannu Lehtonen, 01.01.2008 → 31.12.2008
First International Symposium of Winter Limnology, Hannu Lehtonen, 01.01.2008 → 31.12.2008, Finland
Asiantuntijuus SLL:ssä, Hannu Lehtonen, 01.01.2010 → 31.12.2010, Finland
Loihdyöryhmä (salmon working group), Hannu Lehtonen, 29.12.2010 → 31.08.2011
Puheenjohtajuus kansainvälisessä työryhmässä, Hannu Lehtonen, 01.01.2010 → 31.12.2010, Italy
Toimitusjohtajana, Hannu Lehtonen, 01.01.2010 → 31.12.2010, Poland
Toimitusjohtajana, Hannu Lehtonen, 01.01.2010 → 31.12.2010, Sweden

Leena Nurminen,
Vesibiologinen standardisointi työryhmä, Leena Nurminen, 2009 → 2011

Anne Ojala,
Suurjärvien yhteistyöryhmä, Anne Ojala, 2008 → 2012
Suurjärvienyhteistyöö suunnittelu, Anne Ojala, 2008 → 2012
NERC Research Programme on Networks of Sensors; assessment of proposals, Anne Ojala, 2010 → ..., United Kingdom

Anssi Vähätalo,
European Science Foundation, Anssi Vähätalo, 01.01.2006 → 31.12.2006
National Science Foundation, Anssi Vähätalo, 01.01.2006 → 31.12.2006, United States
Helsingin Seudun lintututkimuskeskus, Anssi Vähätalo, 01.01.2007 → 31.12.2007, Finland
Societas Biologica Fennica Vanamo, Anssi Vähätalo, 01.01.2007 → 31.12.2007, Finland
City University of Hong Kong, Anssi Vähätalo, 01.01.2008 → 31.12.2008
National Science Foundation, Anssi Vähätalo, 01.01.2008 → 31.12.2008

Membership or other role in public Finnish or international organization

Jukka Horppila,
Laajennetun ja erityisesti ilmastonmuutoksen vaikutusten tutkimustaidon kehittämisen toimialueen hallituksen puheenjohtajana, Jukka Horppila, 01.01.2005 → 31.12.2005, Finland
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RC-SPECIFIC TUHAT COMPILATIONS OF OTHER SCIENTIFIC ACTIVITIES 2005-2010

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Hannu Lehtonen,

* Vesijärvi 2 projektin ohjausryhmä, Hannu Lehtonen, 01.01.2005 → 31.12.2005, Finland
ERÄ:n Suomen suurin kala kilpailu, Hannu Lehtonen, 01.01.2005 → 31.12.2005, Finland
Ennätyskalalautakunta, Hannu Lehtonen, 01.01.2005 → 31.12.2005, Finland
European Anglers Alliance, Hannu Lehtonen, 01.01.2005 → 31.12.2005
Helsingin yliopiston Aikuiskoulutuskeskuksen Kotkan yksikön kalataloushankkeiden ohjausryhmä, Hannu Lehtonen, 01.01.2005 → 31.12.2005, Finland
Helsingin yliopiston ja Enontekiön kunnan yhteistyöryhmä, Hannu Lehtonen, 01.01.2005 → 31.12.2005, Finland
Pelastakaa villilohi ry, Hannu Lehtonen, 01.01.2005 → 31.12.2005, Finland
Suomen Vapaa-ajankalastajien keskusjärjestö ry, Hannu Lehtonen, 01.01.2005 → 31.12.2005, Finland
ERÄ:n Suomen suurin kala kilpailu, Hannu Lehtonen, 01.01.2006 → 31.12.2006, Finland
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Helsingin yliopiston Aikuiskoulutuskeskuksen Kotkan yksikön kalataloushankkeiden ohjausryhmä, Hannu Lehtonen, 01.01.2006 → 31.12.2006, Finland
Helsingin yliopiston ja Enontekiön kunnan yhteistyöryhmä, Hannu Lehtonen, 01.01.2006 → 31.12.2006, Finland
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Vesijärvi 2 projektin ohjausryhmä, Hannu Lehtonen, 01.01.2006 → 31.12.2006, Finland
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Helsingin yliopiston Aikuiskoulutuskeskuksen Kotkan yksikön kalataloushankkeiden ohjausryhmä, Hannu Lehtonen, 01.01.2007 → 31.12.2007, Finland
Helsingin yliopiston ja Enontekiön kunnan yhteistyöryhmä, Hannu Lehtonen, 01.01.2007 → 31.12.2007, Finland
Pelastakaa villilohi ry, Hannu Lehtonen, 01.01.2007 → 31.12.2007, Finland
Suomen Vapaa-ajankalastajien keskusjärjestö ry, Hannu Lehtonen, 01.01.2007 → 31.12.2007, Finland
Suomen luonnonsuojeluliiton kalaryhmä, Hannu Lehtonen, 01.01.2007 → 31.12.2007, Finland
Vesijärvi 2 projektin ohjausryhmä, Hannu Lehtonen, 01.01.2007 → 31.12.2007, Finland
ERÄ:n Suomen suurin kala kilpailu, Hannu Lehtonen, 01.01.2008 → 31.12.2008, Finland
Ennätyskalalautakunta, Hannu Lehtonen, 01.01.2008 → 31.12.2008, Finland
Helsingin yliopiston Aikuiskoulutuskeskuksen Kotkan yksikön kalataloushankkeiden ohjausryhmä, Hannu Lehtonen, 01.01.2008 → 31.12.2008, Finland
Helsingin yliopiston ja Enontekiön kunnan yhteistyöryhmä, Hannu Lehtonen, 01.01.2008 → 31.12.2008, Finland
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Jäsenyys Uudenmaan vesienhoidon yhteistyöryhmässä, Hannu Lehtonen, 01.01.2010 → 31.12.2010, Finland
Jäsenyys hallitusessa, Hannu Lehtonen, 01.01.2010 → 31.12.2010, Finland

Mikko Olin,

Fish based ecological classification of lakes, Mikko Olin, 01.01.2006 → …, Finland
National register for standard fish data, Mikko Olin, 01.09.2006 → …, Finland
International Evaluation of Research and Doctoral Training at the University of Helsinki

RC-Specific Tuhat Compilations of Other Scientific Activities 2005-2010

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Membership or Other Role of Body in Private Company/Organization

Hannu Lehtonen,

Suomen Vapaa-ajankalastajien Keskusjärjestö ry, Hannu Lehtonen, 01.01.2005 → 31.12.2005, Finland

Suomen WWF, Hannu Lehtonen, 01.01.2005 → 31.12.2005, Finland

Suomen Luonnonsuojeluliitto, Hannu Lehtonen, 01.01.2006 → 31.12.2006, Finland

Suomen Vapaa-ajankalastajien Keskusjärjestö ry, Hannu Lehtonen, 01.01.2006 → 31.12.2006, Finland

Suomen WWF, Hannu Lehtonen, 01.01.2006 → 31.12.2006, Finland

Suomen Luonnonsuojeluliitto, Hannu Lehtonen, 01.01.2007 → 31.12.2007, Finland

Suomen WWF, Hannu Lehtonen, 01.01.2007 → 31.12.2007, Finland

Vapaa-ajankalastajien Keskusjärjestö ry, Hannu Lehtonen, 01.01.2007 → 31.12.2007, Finland

Suomen Luonnonsuojeluliitto, Hannu Lehtonen, 01.01.2008 → 31.12.2008, Finland

Suomen Vapaa-ajankalastajien Keskusjärjestö ry, Hannu Lehtonen, 01.01.2008 → 31.12.2008, Finland

Suomen WWF, Hannu Lehtonen, 01.01.2008 → 31.12.2008, Finland

Anssi Vähätalo,

Helsingin seudun lintutieteellinen yhdistys Tringa ry, Hangon Intuusamian Intuusamatoimikunta, Anssi Vähätalo, 01.01.2005 → 31.12.2005, Finland

Suomen Biologian Seura Vanamo ry, Anssi Vähätalo, 01.01.2005 → 31.12.2005, Finland

Helsingin Seudun Lintutieteellinen Yhdistys Tringa, Anssi Vähätalo, 01.01.2006 → 31.12.2006, Finland

Suomen biologian seura Vanamo, Anssi Vähätalo, 01.01.2006 → 31.12.2006, Finland

Helsingin seudun lintutieteellinen yhdistys, Anssi Vähätalo, 01.01.2008 → 31.12.2008, Finland

Participation in Interview for Written Media

Jukka Horppila,


Tapahtuma, Jukka Horppila, 28.11.2003 → 31.12.2011, United Kingdom

Tilaisuus: Kalamiesten keskusliiton XIX Kalastusaluepäivät, Jukka Horppila, 13.02.2007 → 31.12.2011, Finland

Kimmo Kahilainen,


Sanomalehtiartikkeli Etelä-Suomen Sanomat 27.11.2004 s. 16, Kimmo Kahilainen, 27.11.2004 → 31.12.2011, Finland

Paikallislehti Inarilainen, Kimmo Kahilainen, 11.06.2008 → 31.12.2011, United States

Hannu Lehtonen,

Oulun kirjamessut, Hannu Lehtonen, 16.05.2008 → 31.12.2011, Finland

YLE, Tiedelinko, Hannu Lehtonen, 28.11.2008 → 31.12.2011, Finland

Anne Liljendahl,

Haastattelu Ylen länninen -kanavalla, Anne Liljendahl, 27.07.2001 → 31.12.2011, Finland

Hilderveden sujuksuyhdistys ry:n vuosikokous, Anne Liljendahl, 26.06.2001 → 31.12.2011, Finland

Turun Sanomat, Anne Liljendahl, 23.08.2001 → 31.12.2011, Finland

Tommi Tapani Malinen,

The municipality of Artjärvi don't finance phantom midge studies in Artjärvi lakes, Tommi Tapani Malinen, 28.09.2006

Mphantom midge population in one suspicion of cyanobacterial blooms in Lake Hidenvesi, Tommi Tapani Malinen, 15.10.2010

Phantom midge population collapsed in Lake Hidenvesi, Tommi Tapani Malinen, 13.10.2010

Phantom midge population of Lake Hidenvesi has dropped, Tommi Tapani Malinen, 06.10.2010
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Anne Ojala,
Vedenpäivä, Asikkala, Anne Ojala, 01.01.2004 → 31.12.2011, Finland
Haastattelu Muoviyhdistys ry:n jäsenlehteen, Anne Ojala, 2010 → …

Mikko Olin,
Hiihtoeläinten ja nestelijöiden kunnostus Hiihtoveteen, Mikko Olin, 19.03.2005, Finland

Participation in radio programme

Hannu Lehtonen,
Radio Suomi, Hannu Lehtonen, 09.11.2005 → 31.12.2011, Finland
Radio Suomi, Hannu Lehtonen, 09.11.2006 → 31.12.2011, Finland
Radio Suomi, Hannu Lehtonen, 19.03.2007 → 31.12.2011, Finland
radio, Hannu Lehtonen, 06.03.2008 → 31.12.2011, Finland
radion Luontosuomi-ohjelma, Hannu Lehtonen, 16.01.2008 → 31.12.2011, Finland
Keskusteluhetkia radioissa, Hannu Lehtonen, 05.08.2010
Radiohaastattelu, Hannu Lehtonen, 01.06.2010
Radiohaastattelu, Hannu Lehtonen, 18.08.2010
radiohaastattelu, Hannu Lehtonen, 18.06.2010

Tommi Tapani Malinen,
Surprise result in Lake Kaukjärvi studies, Tommi Tapani Malinen, 01.02.2008
Phantom midge population fluctuates in Lake Hiidenvesi, Tommi Tapani Malinen, 2010

Mikko Olin,
Päivä tunnissa-ohjelma, Radio Suomi, Mikko Olin, 18.07.2005, Australia

Anssi Vähätalo,
Radio-ohjelma, Anssi Vähätalo, 01.01.2008 → 31.12.2011, Finland

Participation in TV programme

Hannu Lehtonen,
TV Nytt, Hannu Lehtonen, 22.04.2006 → 31.12.2011, Finland
TV Nytt, Hannu Lehtonen, 13.02.2007 → 31.12.2011, Finland
TV-ohjelma, Hannu Lehtonen, 07.01.2008 → 31.12.2011, Finland
Essintymen TV-ohjelmasa, Hannu Lehtonen, 13.03.2010
TV-haastattelu, Hannu Lehtonen, 15.10.2010
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Participation in interview for web based media
Tommi Tapani Malinen,
The density and biomass of fish stocks in Lake Tuusulanjärvi in 2006-2007, Tommi Tapani Malinen, 13.03.2008
Abundance of fish and phantom midges in Lake Hiidenvesi during 2007, Tommi Tapani Malinen, 27.01.2009
The phantom midge population has collapsed during two years - possible effects on food web, Tommi Tapani Malinen, 08.10.2010
Research Group: Horppila J

Basic statistics

<table>
<thead>
<tr>
<th>Metric</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Number of publications (P)</td>
<td>103</td>
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<tr>
<td>Number of citations (TCS)</td>
<td>424</td>
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<tr>
<td>Number of citations per publication (MCS)</td>
<td>4.12</td>
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<tr>
<td>Percentage of uncited publications</td>
<td>34%</td>
</tr>
<tr>
<td>Field-normalized number of citations per publication (MNCS)</td>
<td>1.19</td>
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<tr>
<td>Field-normalized average journal impact (MNJS)</td>
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<tr>
<td>Field-normalized proportion highly cited publications (top 10%)</td>
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</tr>
<tr>
<td>Internal coverage</td>
<td>.68</td>
</tr>
</tbody>
</table>

Trend analyses

![Graph of MNCS, THCP10, and MNJS trends]

Collaboration

![Graph of collaboration types]

Performance (MNCS) by collaboration type
INTERNATIONAL EVALUATION OF RESEARCH AND DOCTORAL TRAINING
AT THE UNIVERSITY OF HELSINKI
by CWTS, Leiden University, the Netherlands

Research profile

![Research profile chart](chart.png)

Threshold: $P \geq 4$