

EU-CONEXUS RESEARCH FOR SOCIETY

D. 6.4

"Open Access Journal"

2023

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Document Information:**Grant Agreement Number:** 101017436**Project Acronym:** EU CONEXUS-RESEARCH FOR SOCIETY**Work Package:** WP6**Outcome Number:** D6.4**Version:** 2.0**Due Date:** M36 (February 2024)**Delivery Date:** 1/02/2024**Dissemination Level:** Public**Task leader:** La Rochelle Université**Participating partners:** All partners**Authors:** LRUniv**Internal Reviewers:** RFS WP6 members, Isabelle Baer-Eiselt, Edita Lenkauskaite, Research Council**Keywords:** European Research Area, European University, Popular Science Journal, Science to Society, Citizen Engagement

| HISTORY OF CHANGES | | | | |
|--------------------|------------------|--------|--------------------|---------|
| Version | Publication date | Status | Partner university | Changes |
| 1.0 | 30/11/2023 | Draft | LRUniv | |
| 2.0 | 30/01/2024 | Final | LRUniv | |

| QUALITY CHECK | | | |
|------------------|------------|----------------------------------|-------------|
| Version Reviewed | Date | Reviewer (Partner) | Description |
| 1.0 | 29/01/2024 | EU-CONEXUS Executive Director | |

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Preamble

This document is part of the work conducted in the EU-CONEXUS-RESEARCH FOR SOCIETY project funded by the European Union's Horizon 2020 under the Science with and for Society programme. This 3-year project aims to strengthen the Research & Innovation dimension of the European University for Smart Urban Coastal Sustainability – EU-CONEXUS and to foster the R&I institutional transformation of the 6 EU-CONEXUS-RFS partner universities: La Rochelle Université (LRUniv), Agricultural University of Athens (AUA), Technical University of Civil Engineering Bucharest (UTCB), Klaipeda University (KU), Catholic University of Valencia (UCV) and University of Zadar (UNIZD).

Within the project, Work Package 6 “Open Science and Citizen Involvement” aims to make science more accessible both for researchers and the wider public, by promoting open science and citizens involvement in science events and activities. To serve this objective, the working group made an inventory of barriers and good practices for the implementation of open and participatory sciences, and wrote guidelines on participatory science. In parallel they also implemented three “instruments” aiming to promote open and popular science: the implementation of a joint Open Aire Gateway platform gathering open access research outputs from EU-CONEXUS partner institutions; the creation of an open access popularized journal available to the general public; and the organisation of popular science events.

This report outlines the creation of the open access popularized journal. The 6 EU-CONEXUS-RFS partners as well as EU-CONEXUS partner South East Technological Institute (SETU) participated to its conception.

Regular meetings with RFS WP6 representatives took place to prepare this deliverable:

- 9 April 2021
- 27 May 2021
- 23 July 2021
- 11 October 2021
- 8 December 2021
- 14 February 2022
- 4 May 2022
- 27 June 2022
- 04 January 2023 (editorial board)
- 9 March 2023
- 29 March 2023 (editorial board)
- 5 April 2023
- 10 May 2023
- 20 November 2023

Introduction

Science and technology have an impact on almost every part of our daily lives. In spite of this there can be a degree of ambivalence about science in our wider society, and past research has shown that there is not always a widespread understanding of science, or scientific methods. This has led to calls for a more open dialogue between scientists, policy makers and the general public.¹

Popular science serves this goal: by capturing science methods and results and communicating them in a language accessible to all – children, youth, as well as adults – popularisation allows to democratize science by informing non-scientific people (sometimes along with scientists from other fields) of scientific results and innovations. In a knowledge-based society where information is continuously flowing, making science understandable to the wider public is key to build trust in science, improve young people's culture and for citizens to be knowledgeable on research and technological outcomes and make well-informed choices. It also allows to create conditions under which policy decisions are more effective in meeting society's needs and more soundly based in science².

In 2001, the European Union Council adopted a resolution on "[science and society and on women in science](#)" inviting both EU Member States and the European Commission to become more active in bringing science and society closer and to "undertake efforts to improve public awareness of science and technology, to stimulate the popularisation of science and the interest of the media in this respect". It recognized the need "to stimulate a dialogue with society at large on issues of public interest and concern in the field of science" and "to promote interest in science education, in research and in careers in science among young people".³

Since then, "Science and society" projects have been supported by the European Union through various initiatives including the [science and society programme](#) in the 6th and 7th Framework Programme (2002-2006, 2007-2013) and the Responsible Research & Innovation approach developed under the 7th Framework Programme for Research and Technological Development (2007-

¹ European Commission, Directorate-General for Communication, Directorate-General for Research and Innovation, *Responsible research and innovation (RRI), science and technology – Report*, Publications Office, 2013, <https://data.europa.eu/doi/10.2777/45726>

² *Science and society: specific programme for research, technological development and demonstration : "Structuring the European Research Area" under the Sixth Framework Programme 2002-2006*
<https://cordis.europa.eu/programme/id/FP6-SOCIETY>

³ European Commission, Directorate-General for Research and Innovation, Warin, C., Delaney, N., Tornasi, Z., *Citizen science and citizen engagement – Achievements in Horizon 2020 and recommendations on the way forward*, Delaney, N.(editor), Tornasi, Z.(editor), Publications Office, 2020, <https://data.europa.eu/doi/10.2777/05286>

2013), which called for further engagement of communities in scientific and technological development processes and for increased science education and open access to research outputs. Under Horizon2020, the “[Science with and for Society](#)” work programme (2014-2020) aimed to go further in emphasizing linkages between science and society. Bringing science closer to society is now one of the 20 priority areas of the [ERA Policy Agenda 2022-2024](#). ERA Policy Action n°14 states the following: “To reach the ambitious targets of the European Green Deal, broad public mobilisation and engagement is required. Citizens and local communities need to be empowered and activated to take action. To create stronger public understanding, connection and engagement should be promoted through regular citizen science campaigns as well as education and training activities”. Citizen engagement is also a key element of the EU Missions of Horizon Europe, through polls, online discussions, citizen events and conferences. This participative approach is meant to develop policies and initiatives closer to societal expectations.⁴

In this larger context, EU-CONEXUS-RFS aims to raise public awareness on the sustainable development challenges faced by urban coastal areas to increase citizens’ interest in those topics, and to make research available and understandable to policy makers, stakeholders, and the general public. Creating a popular science journal serves the objective to inform the public about what is going on in the world of science of the EU-CONEXUS Alliance.

⁴ European Commission, Directorate-General for Research and Innovation, “*EU Missions & citizen engagement activities*”, https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/eu-missions-citizen-engagement-activities_en

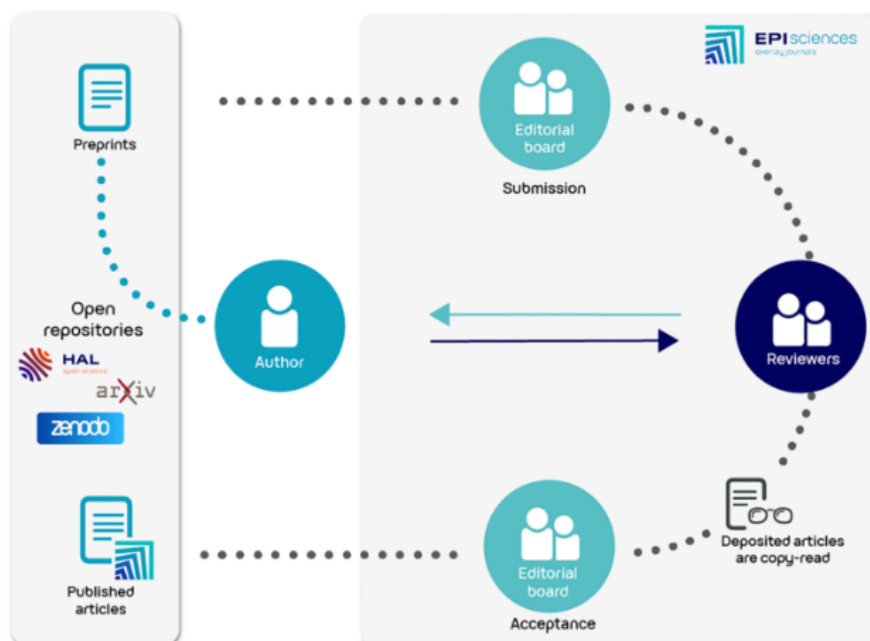
Journal creation process

1. Journal format

In June 2021, a task force composed of a representative from each partner institution already involved in RFS WP6 was created in order to develop the journal.

The overall goal of the task was to create an online open access journal popularising peer-reviewed scientific articles written by researchers from EU-CONEXUS universities, that are already published and available in open access repositories in order to showcase EU-CONEXUS research to the public.

The overlay journal format was initially chosen: an overlay or epi-journal is an open access online journal re-using peer-reviewed scientific papers already published in an open archive. The editorial process of an overlay journal is the following: authors deposit their article in an open archive; the editorial board of the overlay journal locate and examine the article, and submit its review to reviewers, leading to a round of evaluation and to the possible article's acceptance for re-publication in the overlay journal.



Example of Episciences overlay journals platform publishing workflow

Source: <https://www.episciences.org/publishing-model/>

There are many advantages to this format:

- It relies on a diamond Open Access evaluation and publication platform (no access and publication fees) and therefore complies with Open Science principles
- It can evolve toward a standard peer-reviewed open access journal

- It is easy to implement in the context of the RFS relatively short project lifetime:
 - There are no copyright issues as editorial board members select articles from open access repositories
 - It can be entirely managed by researchers forming the editorial board and ensuring a quality control through a publishing workflow (giving back researchers control on their publications)
 - It answers the reluctance of many researchers to submit an original paper in a new open access academic journal (despite change coming slowly, they still need to publish in high-factor impact journals as it is a career assessment criteria)

2. Editorial line

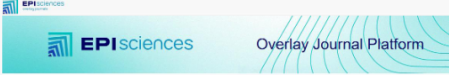
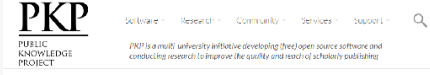
The task force defined the editorial line of the journal and outlined key points:

- To promote the variety of research conducted in EU-CONEXUS partner institutions with a focus on topics related to the smart and sustainable development of coastal cities, and to explain the application of this research to our everyday environment.
- To render the topics' complexity understandable for a large audience
- To publish papers but also abstracts and popularised content (text summary, video, infographics, interview etc.) as well as the hyperlink to the full scientific article available in open access repository.
- If timing allows, to publish two issues instead of the one issue expected in the project.
- To insert abstracts in English and in the partner's national language
- To involve students in future issues, for example with a special issue on thesis and dissertations in order to train them to write a summary and increase awareness on their research subjects.

3. Hosting platform

Platforms to host the journal were then benchmarked according to several criteria: cost, human resources effort, platform visibility, technical support required to maintain the platform, and access to the platform.

Two platforms stood out: [Episciences](#) and [Open Journal Systems](#)

| EPISCIENCES | OJS |
|---|--|
|  <ul style="list-style-type: none"> Cloud-based Ready to use Completely free Technical support from the CCSD, maintenance and enhancements ensured by a qualified team |  <ul style="list-style-type: none"> Versatile Customizable Plug-ins developed on a continuous basis by an active community Very popular product, used extensively, especially by Zadar and Valencia Costs to estimate in ensuring hosting and maintenance |

OJS was preferred according to the evaluation criteria. Some partners already used the platform, including the University of Zadar who kindly proposed to use their platform instance to host the EU-CONEXUS open access journal. Nevertheless, the platform choice will later evolve considering the journal increased focus on popularisation (see section [Article popularisation](#)).

4. Editorial board

In parallel, a survey was spread in partner institutions in order to inform the research community about the journal development project and to find volunteers to join the journal editorial board. The survey objective was also to understand researchers' publishing habits and how they disseminated their work. They were asked the following questions:




- 1) Your current and medium-term research topics related to the specific thematic of EU-CONEXUS
- 2) Do you work in collaboration with research groups of another EU-CONEXUS partner university? If so please indicate the topics.
- 3) In which type of publication do you mainly disseminate your work? (Article, book chapter, conference proceedings, posters...)
- 4) Where do you mainly publish? (peer-reviewed journal, others...). Please give details: platform name, journal titles.
- 5) Do you usually deposit preprints in a preprints server? If so please provide details (name of the repository, ...)
- 6) Are you a member of the editorial board of one or more journals? If so, please specify the title(s).
- 7) Would you be interested in being a member of the editorial board of the future EU-CONEXUS overlay journal?
- 8) If you wish to share comments or additional information, please do so here.

In order to raise awareness on the journal creation, a flyer to be joined to the survey was created by WP7 Communication and Dissemination:

EU-CONEXUS

Online open access scientific journal on Smart Urban Coastal Sustainability

A JOURNAL MADE FOR ACADEMICS AND SOCIETY

| | |
|---|---|
| <p>Structure</p> <p>Overlay journal: an open access journal reusing already published, peer-reviewed articles available in open access repositories, archives, and open publications.</p> <p>Content</p> <p>Accessible to a general audience to put research into citizens' everyday context: articles accompanied by popularized abstracts translated into local languages, interviews, graphics, and videos that popularise and put the research into everyday context for the citizen.</p> <p style="border: 1px solid #007bff; padding: 5px; margin-top: 10px;">This is a funding priority for the European programme, Research for Society</p> | <p>FIRST ISSUE IN 2023</p> <p> Will highlight the impact of research for society and the environment</p> <p>SELECTED BY</p> <p> an editorial board composed with volunteers from EU-CONEXUS academics</p> <p>WRITTEN BY</p> <p> EU-CONEXUS researchers</p> <p>DESIGNED BY</p> <p> authors, editors, students or external help (journalists)</p> |
|---|---|

Vision:

This journal will be a unique tool for researchers to contribute to the dialogue between science and society, through the dissemination of scientific culture and information accessible to a wider audience. It may give early-career researchers a chance to promote their work more widely. This journal may also evolve to become a diamond open-access peer-reviewed journal.

More than 30 researchers answered the survey, among which more than 20 showed an interest in joining the journal editorial board. In order to reach a balance between partners, WP6 representatives from each partner institution selected between 1 and 3 researchers from their institution to join the editorial board, taking gender balance and scientific discipline balance into account. Eventually, the editorial board was set up with 12 members and met twice between January and March 2023 to exchange on the journal content and article selection process.

5. Article selection

A list of scientific articles was initiated by the task leader. It included more than 200 papers located after several criteria: they were published in the last 4 to 5 years, addressed SmUCS topics and the full article text was available online in an open access repository. Editorial board members were invited to review and complete the list with additional papers that may have been missed, and to propose a shortlist of 2 to 5

articles from their respective institutions, reflecting the research conducted in their university and taking account gender and topic balance. This resulted in a shortlist of 24 articles. Finally, editorial board members were asked to vote for 2 articles per partner institution.

The final selection of 6 papers reflects the articles that got the highest number of votes. They cover various topics and have a fair distribution between authors' gender:

UCV 2022, Physical Education Teachers' Perceived Digital Competences: Are They Prepared for the Challenges of the New Digital Age? (Thematic: *Sustainability*)

Authors : [Gabriel Martínez-Rico](#), [Mauro Alberola-Albors](#), [Carlos Pérez-Campos](#), [Rómulo J. González-García](#).

<https://doi.org/10.3390/su14010321>

UNIZD 2021, Seascape context as a driver of the fish community structure of *Posidonia oceanica* meadows in the Adriatic Sea (Thematic: *Marine*)

Authors: [Ivana Zubak Čižmek](#), [Stewart Tyre Schultz](#), [Claudia Kruschel](#) and [Hrvoje Čižmek](#)

<https://doi.org/10.2478/cjf-2021-0011>

UTCB 2023, Seismic Design Codes-Key Elements for Seismic Risk Perception and Reduction in Europe (Thematic: *Engineering*)

Author : [Florin Pavel](#)

<https://doi.org/10.3390/buildings13010158>

AUA 2021, Malpigmentation of Common Sole (*Solea solea*) during Metamorphosis Is Associated with Differential Synaptic-Related Gene Expression (Thematic: *Aquatic, Animal Sciences*)

Author : [Menelaos Kavouras](#), [Emmanouil E. Malandrakis](#), [Ewout Blom](#), [Kyriaki Tsilika](#), [Theodoros Danis](#), [Panagiota Panagiotaki](#), [Athanasios Exadactylos](#)

<https://doi.org/10.3390/ani11082273>

KU 2021, Evidence-based public policy decision-making in smart cities: does extant theory support achievement of city sustainability objectives ? (Thematic: *Sustainability, Smart city*)

Author : [David Mills](#), [Steven Pudney](#), [Primoz Pevcin](#), [Jaroslav Dvorak](#)

<https://doi.org/10.3390/su14010003>

LRUniv 2020, Paving the way to coastal adaptation pathways: An interdisciplinary approach based on territorial archetypes (Thematic: *Environmental Science & Policy*)

Authors : Nicolas Rocle, Hélène Rey-Valette, François Bertrand, Nicolas Becu, Nathalie Long, Cécile Bazart Didier Vye, Catherine Meur-Ferec, Elise Beck, Marion Amalric, Nicole Lautrédou-Audouy

<https://doi.org/10.1016/j.envsci.2020.05.003>

Later on, EU-CONEXUS partner South East Technological University (SETU) from Waterford, Ireland who were very active in WP6 activities, asked whether they could also propose an article to be published and popularised in the journal. In a desire to open this activity to all EU-CONEXUS partner universities and not only RFS partners, the proposal was accepted. The following article was proposed and selected for SETU:

SETU 2023, Fretting wear and fatigue in submarine power cable conductors for floating offshore wind energy (Thematic: *Engineering, Energy*)

Authors: C. Poon, S.M. O'Halloran, A. Connolly, R.A. Barrett, S.B. Leen

<https://doi.org/10.1016/j.triboint.2023.108598>

The editorial board also brainstormed on a name for the popular science journal and chose “Smart Urban Coastal Sustainability”.

Despite the selected articles being available in open access and copyright issues avoided, the editorial board contacted the articles’ authors from their respective institution to let them know that their article had been selected to be re-published and popularised in the EU-CONEXUS open access popular science journal, explain them the popularisation process and ask their consent. An authorization form was created for this purpose (see Appendix 1). The journal project was presented as an opportunity for the researchers to enhance the visibility and impact of their work while contributing to the broader dissemination of scientific knowledge.

6. Article popularisation

The last but not least development step was the popularisation of the articles’ content. This work was a combined effort between the team from LRUniv (task leader) and each institution (editorial board member, working group representative and article’s author) with back and forth exchanges to make sure that the popularised content reflected the scientific rigor and accuracy of the research work while inspiring curiosity and interest from the general public.

Researchers whose article was selected shared positive feedback on this initiative and kindly spared time to help with the popularisation of their articles. They were proposed to provide content if they already had popularised material or to help create some by sharing ideas and suggestions. It was specified that the hyperlink redirecting to their scientific paper would be embedded at the end of the popularised article. Partners were invited to propose pictures or videos to accompany their article and to provide an abstract in their national language. Most of the scientific papers were popularised in the form of a text with pictures, while one was popularised in the form of a written interview of the researcher.

As the journal content took shape, it became clearer that its focus would be science popularisation rather than re-publishing open access scientific publications in the form of an overlay journal. Taking this into consideration, some challenges appeared regarding the use of the OJS hosting platform: the editorial and publishing process and the shift from a pure scholarly overlay journal to a popular science journal did not fit well with OJS platform requirements anymore. A certain amount of information was required to open an overlay journal on OJS including an editor-in-chief, the journal publishing frequency and an e-ISSN number. The article selection was done in a collegial manner by editorial board members so no editor-in-chief was clearly identified. Furthermore, the publishing frequency and the ISSN number (journal identification number for serial publications) raised the question of the future of the journal: with the RFS project ending early 2024, the sustainability of this activity is not

guaranteed as it requires coordination efforts, human resources and skills to popularise articles' content, and to count on the renewed support from the editorial board volunteer members. Taking turns each year to manage new journal issues was envisaged yet sustaining the activity without a continued financial support was questioned. Also, the recently-awarded EU-CONEXUS ENABLES project in response to the European Excellence Initiative call for proposal under the WIDERA programme includes an open access peer-reviewed scientific journal and this activity needs to be clarified in regard to the popular science journal. Before surveying partners on these questions and drafting a potential Memorandum of Understanding defining terms for the journal sustainability, it was suggested to finalize and publish the 1st journal issue. Due to this uncertainty and to the journal focus on popular science, it was eventually decided to publish the first issue in the form of an interactive flipbook hosted on the EU-CONEXUS website, using [Issuu](#) software on which KU had an account. The journal design was done by LRUiv Communication team in collaboration with RFS WP7 leader and was reviewed by EU-CONEXUS Joint Communication Unit.

Once all articles popularised and the design finalized, the journal was formatted as an online interactive flipbook with the possibility to download it as a pdf document.

Issuu link: https://www.eu-conexus.eu/wp-content/uploads/2024/01/RFS_Epi-Journal_2023_compressed.pdf

PDF download link: https://www.eu-conexus.eu/wp-content/uploads/2024/01/RFS_Epi-Journal_2023_compressed.pdf

Journal dissemination

A communication campaign was launched in order to promote the journal to the public:

- **EU-CONEXUS communication channels:** the news of the journal launch was shared on the EU-CONEXUS website (see [article](#)) and communication channels (see [LinkedIn](#) post, [Instagram](#) post and [Facebook](#) post) in order to promote it among the Alliance community. Investing in social media Ads was suggested in order to increase the journal reach to students, the wider public and people interested in topics addressed in the journal.
- **Partners communication channels:** EU-CONEXUS partner institutions will in turn relay the news in their own internal channels (institutional website, library website and network, newsletter, intranet, social media, partner associations and stakeholders, etc.) in order to further reach their community including

students and stakeholders who are seen as a key target of the popular science journal.

- **Dissemination to secondary schools:** Partners are also keen to promote the journal to secondary schools – each institution will choose the most adequate communication channel according to their organisation (through high-school associations, emailing to secondary school teachers, library networks, etc.)
- **Events:** Partners also proposed to present EU-CONEXUS popular science journal at the occasion of events organised in their library or other related events, such as the OPERAS conferences (Opening Collaboration for Community-Driven Scholarly Communication). On that regard, the University of Zadar proposed to present a poster about the journal at their [OPERAS 2024 conference](#).

Finally, depositing the journal in open access directories such as [revues.org](#), [DOAJ](#) or [Mir@bel](#) was considered, however these directories require journals doted of an e-ISSN. Due to the uncertainty about future journal issues, such a serial number was not requested to the ISSN international organisation for the journal.

Conclusion

Creating a common popular science journal was a rich learning experience for EU-CONEXUS-RFS partners. It opened a dialogue on Open Science practices where partners exchanged their experience and knowledge on open access journals and popular science. It was also a great opportunity for partners to join forces to promote EU-CONEXUS research to the society as well as to the Alliance's own community.

Popular science is key to raise public awareness on research topics, including those related to societal challenges. It can take various forms, from pedagogical activities for young people to magazine articles and scientific communication competitions like "My thesis in 180 seconds". Conveying complex scientific subjects in a language accessible to a non-scientific audience allows citizens to uptake this knowledge, increase their interest in science and have a more active role on those topics. It can have an impact on people's behavior but also assist public policy makers, stakeholders and businesses in making choices based on science.

In the world of EU-CONEXUS, popular science has the potential to help society better understand the challenges faced by anthropised coastal areas and the possible solutions for a more sustainable future for coastal communities.

The development of an open access popular science journal was a positive experience both for EU-CONEXUS-RFS WP6 representatives and for researchers who had the opportunity to spread their work more widely. Yet, the future of the journal remains to be clarified with the end of the RFS funding, compromising its sustainability and staff engagement. This question will be carefully studied in the coming weeks, considering the upcoming EU-CONEXUS ENABLES project starting in spring 2024 which includes an open access peer-reviewed journal, and partners' position regarding the popularised journal activity.

References

European Commission, Directorate-General for Communication, Directorate-General for Research and Innovation, *Responsible research and innovation (RRI), science and technology – Report*, Publications Office, 2013, <https://data.europa.eu/doi/10.2777/45726>

Science and society: specific programme for research, technological development and demonstration : "Structuring the European Research Area" under the Sixth Framework Programme 2002-2006 <https://cordis.europa.eu/programme/id/FP6-SOCIETY>

European Commission, Directorate-General for Research and Innovation, Warin, C., Delaney, N., Tornasi, Z., Citizen science and citizen engagement – Achievements in Horizon 2020 and recommendations on the way forward, Delaney, N.(editor), Tornasi, Z.(editor), Publications Office, 2020, <https://data.europa.eu/doi/10.2777/05286>

European Commission, Directorate-General for Research and Innovation, "EU Missions & citizen engagement activities", https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/eu-missions-citizen-engagement-activities_en

Horizon 2020 Work Programme 2014-2020 Science with and for Society
<https://www.sfi.ie/funding/international/european-research-area/horizon-2020/swafs/swaf-pdf-1.pdf>

European Research Area Policy Agenda 2022-2024
https://commission.europa.eu/system/files/2021-11/ec_rtd_era-policy-agenda-2021.pdf

Episciences Overlay Journals <https://www.episciences.org/>

Open Journal Systems <https://openjournalsystems.com/>

Appendices

Appendix 1: Author's authorization form

EU-CONEXUS-Research For Society

Popular science epi-journal

 EU CONEXUS
Research for Society

This project has received funding from the European Union's Horizon 2020 research and innovation Programme under grant agreement No 101017436

Author authorization form to use article's open access content and hyperlink for scientific popularisation purposes

Introduction

The European University for Smart Urban Coastal Sustainability - **EU-CONEXUS** - was created in response to an Erasmus+ call inviting European universities to create transnational alliances to strengthen strategic university partnerships across Europe and develop the international competitiveness of European universities. Strategically distributed over 9 European coastal regions, EU-CONEXUS partner universities aim to implement a brand-new model of a European inter-university campus with a signature thematic focus on a **smart and sustainable development of urban coastal areas**.

The Horizon-2020-funded **EU-CONEXUS-Research For Society (RFS)** project aims at creating a joint transnational science and innovation agenda within the Alliance, contributing to more socially responsible human resources management, exploring joint research infrastructures and resources, and developing an innovation management strategy as well as methods to promote open and participatory science.

In this context, EU-CONEXUS-RFS partners are creating an **online open access journal on Smart Urban Coastal Sustainability** topics available to researchers, students, stakeholders, and the general public. The journal will popularise the content of scientific articles, written by researchers from EU-CONEXUS-RFS partner universities, that are already published and available in open access repositories, in order to promote EU-CONEXUS research to the society.

Our goal

An overlay online journal entitled Smart Urban Coastal Sustainability with:

- Popularized content for each article designed for a large audience: interview, presentation, graphics, video, etc.
- Embedded hyperlink to the full article available in open access repositories. There is therefore no copyrights issue for the authors.

Article selection

For the first journal issue foreseen in October 2023, 6 articles - one per university - were selected by an editorial committee composed of representatives from each EU-CONEXUS-RFS partner university:

- Catholic University of Valencia (UCV): Margarita CAÑADAS and José LOPEZ
- Technical University of Civil Engineering Bucharest (UTCB): ~~Nastasia~~ SACA
- Klaipeda University (KU): Jaroslav DVORAK, ~~Ligita~~ ŠIMANSKIENĖ, ~~Agnė~~ ŠNEIDERIENĖ
- University of Zadar (UNIZD): ~~Drahomira~~ CUPAR, Zoran ŠIKIĆ

EU-CONEXUS-Research For Society

Popular science epi-journal

- Agricultural University of Athens (AUA) : [Emmanouil MALANDRAKIS](#), [Stefanos KALOGIROU](#)
- La Rochelle Université (LRUniv) : [Cécile CHANTRAINE-BRAILLON](#), [Virginia KOLB](#).

To do so, each editorial board member primarily proposed a shortlist of 2 to 5 articles from their respective institutions, using the following criteria:

- The subject of the article should be consistent with the overall thematic of the journal:
Smart Urban Coastal Sustainability
- The article should be relatively recent (not older than 2018)
- Its full text should be available in open access

The editorial board members were then invited to vote for 2 articles per institution.

The final selection of 6 papers reflects the articles that got the highest number of votes. It covers various and balanced subjects and has a fair distribution between authors' gender:

UCV 2022, Physical Education Teachers' Perceived Digital Competences: Are They Prepared for the Challenges of the New Digital Age? (*Sustainability*)

Authors : [Gabriel Martínez-Rico](#), [Mauro Alberola-Albors](#), [Carlos Pérez-Campos](#), [Rómulo J. González-García](#).

<https://doi.org/10.3390/su14010321>

UNIZD 2021, Seascape context as a driver of the fish community structure of *Posidonia oceanica* meadows in the Adriatic Sea (*Marine*)

Authors : [Ivana Zubak Čižmek](#), [Stewart Tyre Schultz](#), [Claudia Kruschel](#) and [Hrvoje Čižmek](#)

<https://doi.org/10.2478/cj-2021-0011>

UTCB 2023, Seismic Design Codes-Key Elements for Seismic Risk Perception and Reduction in Europe (*Buildings*)

Author : [Florin Pavel](#)

<https://doi.org/10.3390/buildings13010158>

AUA 2021, Malpigmentation of Common Sole (*Solea solea*) during Metamorphosis Is Associated with Differential Synaptic-Related Gene Expression (*Animals*)

Author : [Menelaos Kavouras](#), [Emmanouil E. Malandrakis](#), [Ewout Blom](#), [Kyriaki Tsilika](#), [Theodoros Danis](#), [Panagiota Panagiotaki](#), [Athanasios Exadactylos](#)

<https://doi.org/10.3390/ani11082273>

KU 2021, Evidence-based public policy decision-making in smart cities: does extant theory support achievement of city sustainability objectives? (*Sustainability*)

Author : [David Mills](#), [Steven Pudney](#), [Primoz Pevcin](#), [Jaroslav Dvorak](#)

<https://doi.org/10.3390/su14010003>

LRUniv 2020, Paving the way to coastal adaptation pathways: An interdisciplinary approach based on territorial archetypes (*Environmental Science & Policy*)

Authors : [Nicolas Røgle](#), [Hélène Rey-Valette](#), [François Bertrand](#), [Nicolas Becu](#), [Nathalie Long](#), [Cécile Bazart](#), [Didier Vye](#), [Catherine Meur-Ferrec](#), [Elise Beck](#), [Marion Amalric](#), [Nicole Lautrédou-Audouy](#)

<https://doi.org/10.1016/j.envsci.2020.05.003>

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Appendix 2: Journal screenshots

SMART URBAN COASTAL SUSTAINABILITY

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EU-CONEXUS RESEARCH FOR SOCIETY

EU-CONEXUS European University for Smart Urban Coastal Sustainability

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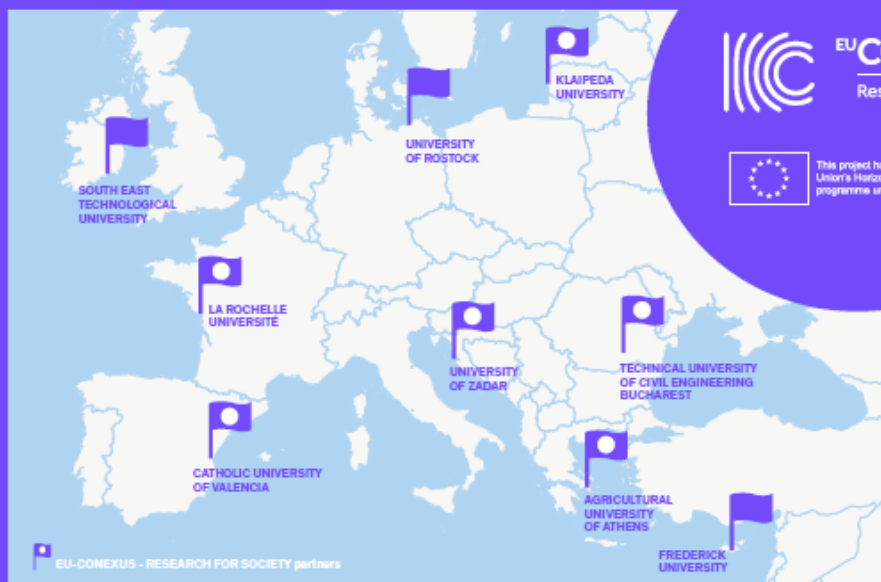
Strategically distributed over European coastal regions, the EU-CONEXUS partner institutions aim to implement a brand-new model of a European inter-university campus with a signature challenge-based focus on **smart and sustainable development of urban coastal areas**.

As part of its Horizon-2020-funded project, EU-CONEXUS-Research For Society, the partners are creating an **online open access popular science journal on Smart Urban Coastal Sustainability** topics available to researchers, students, stakeholders, and the general public.

This journal aims to popularise peer-reviewed scientific articles written by researchers from EU-CONEXUS universities, that are already published and available in open access repositories in order to showcase EU-CONEXUS research to the public.

In this first edition, we will dive into an array of exciting topics: in Ireland, researchers intend to make submarine power cables used in offshore wind energy systems more damage-resistant. In Croatia, you will discover how marine underwater habitats dominated by a seagrass called *Posidonia oceanica* play an essential role in fish communities. In France, researchers are exploring adaptation strategies for coastal cities facing increased erosion and submersion risks due to climate change. And much more...

Happy reading!



EU CONEXUS
Research for Society



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017436

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CROATIA

Underwater meadows: a key to richer marine life in the Adriatic Sea

Čížmek, Ivana Zubak, Schultz, Stewart Tyre, Kruschel, Claudia and Čížmek, Hrvoje. "Seascape Context as a Driver of the Fish Community Structure of *Posidonia oceanica* Meadows in the Adriatic Sea" *Croatian Journal of Fisheries*, vol.79, no.3, 2021, pp.89-109.

Abstract

Marine underwater habitats dominated by seagrass *Posidonia oceanica* play an essential role in fish community assembly, affecting taxonomic and functional diversity, abundance and fish behavior. The value of seagrasses as habitat depends on the spatial arrangement of the seascape elements and the availability of alternative habitats. Little is known about the effect of the seascape context of *P. oceanica* meadows on fish assemblages in the Mediterranean Sea. To identify *P. oceanica* meadows' relative importance as a habitat for fishes, fish communities in the Croatian Adriatic Sea were investigated, using SCUBA lure-assisted visual census. The results show a significant effect of different arrangements of *P. oceanica* meadows' seascape elements and surrounding habitats on fish community structure. Fragmented mosaic meadows with *P. oceanica* growing directly on and between rocky-algal reefs/boulders had significantly higher fish abundances compared to both types of continuous meadows (bordering rock and bordering sand).

Continuous meadows bordering sand harbored the highest number of unique species. Evidence that alternative structured habitats within proximity to seagrass beds may affect the community structure of associated fish assemblages is provided, highlighting the need to consider *P. oceanica* meadows' seascape context in conservation management and experimental design for fish community structure.

seagrass fish assemblage structure
lure-assisted underwater visual census

Smart Urban Coastal Sustainability 9

CROATIA



Abstract in original language

Naselja monke cvjetnice *Posidonia oceanica* igraju važnu ulogu u strukturiranju zajednice riba te utječu na taksonomsku i funkcionalnu raznolikost, brojnost i ponašanje riba. Relativna vrijednost naselja morskih cvjetnica ovisi o prostornoj organizaciji elementa podmorskog okoliša te dostupnosti alternativnih staništa. Međutim, nedovoljno je poznato koji sve čimbenici utječu na strukturu zajednice riba povezanih s ovom morskom cvjetnicom. S ciljem utvrđivanja utjecaja različite prostorne organizacije elementa podmorskog okoliša na zajednicu riba, proveden je vizualni census uz pomoć mamca u naseljima cvjetnice *P. oceanica* u hrvatskom dijelu Jadranskog mora.

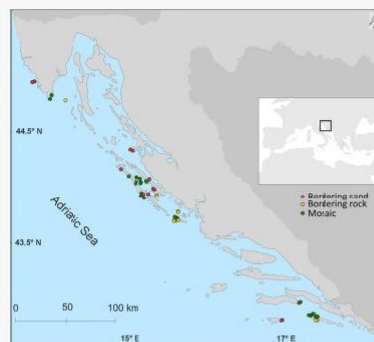
Utvrđen je značajan utjecaj različite prostorne organizacije elementa podmorskog okoliša na strukturu zajednice riba – u rascjepkanim mozačnim naseljima u kojima se *P. oceanica* isprepliće s kamenom podlogom obraslom makro-algama zabilježena je značajno veća brojnost riba u odnosu na kontinuirana cjelovita naselja (uz sediment ili uz kamenitu obalu). U radu su predstavljeni dokazi da dostupnost alternativnih strukturiranih staništa u neposrednoj blizini naselja morske cvjetnice *P. oceanica* utječe na strukturu zajednice riba koje u njoj žive. Neophodno je uzeti u obzir kontekst prostornog rasporeda elemenata podmorskog okoliša kojima dominira morska cvjetnica *P. oceanica* prilikom planiranja znanstvenih istraživanja, ali i kod upravljanja priobalnim područjima.

Posidonia oceanica

© Proje

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CROATIA



Locations of surveyed fish assemblages within *Posidonia oceanica* seagrass meadows in the Eastern Adriatic Sea, Croatia

Article

Underwater habitats with seagrass called *Posidonia oceanica* are crucial for fish communities. They affect the diversity, abundance, and behavior of fish. However, the value of these seagrass habitats depends on how they are arranged in the overall seascape and the availability of other habitats. We still need to learn more about how the surrounding context of *Posidonia oceanica* meadows in the Mediterranean Sea impacts fish populations.

To understand the importance of *Posidonia oceanica* meadows as fish habitats, researchers from the Department of Ecology, Agronomy and Aquaculture at the University of Zadar and from the Marine Explorers Society 20 000 Leagues (a research society focusing on marine biology) studied fish communities in the Croatian Adriatic Sea using SCUBA lure-assisted visual census. They found a significant difference in the number of fish among different seascape contexts of *Posidonia oceanica* meadows. "Fragmented Mosaic" meadows, with *Posidonia oceanica* growing on and between

rocky-algal reefs and boulders, had more fish than "continuous" meadows bordering sand or rocks. Yet, meadows bordering sand had the highest number of unique fish species.

These results indicate that the arrangement of *Posidonia oceanica* meadows and the surrounding habitats significantly impact the structure of fish communities: fragmented mosaic meadows had more fish than continuous meadows, while the latter bordering sand had more unique species. The study also suggests that fish choose their habitats based on their specific needs such as food, shelter, mates and predator avoidance. The presence of alternative structured habitats near seagrass beds can affect the composition of fish communities. →

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CROATIA

These findings emphasize the importance of considering the seascape context of *Posidonia oceanica* meadows in conservation management and experimental design for studying fish communities. Understanding the intricate mosaic of habitats in which seagrass is embedded and its influence on fish function, movement and habitat preference is crucial. This knowledge can help develop more realistic models and conservation plans for fish communities in the Adriatic Sea and other similar regions.

Indeed, *Posidonia oceanica* and other seagrasses are threatened by coastal development, anchoring, pollution, overfishing, and climate change, including biological invasions.

Conservation strategies for *Posidonia oceanica* meadows include:

- By establishing Marine Protected Areas (MPAs) around *Posidonia oceanica* meadows, seagrass habitats are protected from fishing, anchoring, and other damaging activities.
- Restoration techniques include reseedling or transplanting seagrass shoots or using artificial structures to accelerate recovery and improve the ecological performance of seagrass meadows.
- Education on the ecological importance of *Posidonia oceanica* may motivate responsible behavior and seagrass protection.

[Read the scientific paper >](#)

Posidonia oceanica

Posidonia oceanica, sometimes known as Neptune grass, is a seagrass endemic to the Mediterranean Sea. It has long, ribbon-like leaves of dark green color and uses a sophisticated root system to anchor to the bottom. The majority of its vegetative growth is due to subsurface rhizomes generating new shoots. In general, *Posidonia* meadows in the Mediterranean Sea can be found in three seascape contexts:



02
Continuous meadow bordering rocky-algal reefs



01
Continuous meadows bordering sand



03
Mosaic meadows where *Posidonia* grows directly in the crevices of rocks and between rocky boulders with macro-algae

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CROATIA

Top 3 reasons why Posidonia meadows are important

Habitat and nursery grounds: Seagrass meadows support a high level of biodiversity. Many marine animals live in seagrass meadows. Many fish, invertebrates and marine animals use them for shelter, refuge, food, and reproduction. In addition to providing protection from predators, the complex structure of the meadows also supports a web of ecological relationships. Seagrass meadows support a diverse range of commercially and environmentally important fish, crabs and mollusks.

Seagrass meadows help to keep the coast from eroding. Dense vegetation reduces wave and current force, allowing sediments to settle and reducing beach erosion. They safeguard coastal ecosystems.

Posidonia meadows efficiently capture and store CO₂ from the atmosphere, making them important carbon sinks. *Posidonia oceanica* and other seagrasses convert CO₂ into organic matter through photosynthesis, which they store in their sediments. Because the sediments are usually anoxic, the organic matter remains in the sediment for a very long time. By lowering greenhouse gas levels, this process mitigates climate change.



What is SCUBA lure-assisted visual census?

The SCUBA lure-assisted visual census is used to measure the abundance and diversity of marine fish populations. Underwater lures (usually the pieces of lead at the end of a fishing line) attract fish during SCUBA dives, making them easier to identify and count. The lure-assisted strategy increases the likelihood of locating fish that are hidden in the habitat. Divers keep track of fish species, sizes, and numbers.

Smart Urban Coastal Sustainability 13

SPAIN

Physical education teachers' perceived digital competences: are they prepared for the challenges of the new digital age?

Martínez-Rico, Gabriel, Maure Alborado-Albors, Carlos Pérez-Campos, and Rómulo J. González-García. 2022. "Physical Education Teachers' Perceived Digital Competences: Are They Prepared for the Challenges of the New Digital Age?" *Sustainability* 14, no. 1: 321.

Abstract

The development of information and communication technologies impose great changes that require teachers to be constantly updated. Therefore, it is interesting to analyze the Digital Competence perceived by teachers and their ability to use digital devices in the classroom. The aim of this study is to investigate the technological resources and difficulties that Physical Education teachers have in schools, in addition to the training and methodological strategies required to adequately teach Physical Education classes in present times. For this, through a previously validated survey, we will observe the Digital Competence of teachers and whether there are differences between genders, according to age and teaching experience.

A survey has been undertaken by 50 Physical Education teachers of secondary school students. The results show statistically significant differences according to teaching experience and age. In addition, younger teachers have a better perception of their ability to apply Digital Competence in the Physical Education classroom setting.

Key words

Digital Competence physical education teachers' perceptions ICT information technologies communication technologies

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SPAIN



Abstract in original language

El desarrollo de las tecnologías de la información y la comunicación impone grandes cambios que obligan a los docentes a estar permanentemente actualizados. Por ello, es interesante analizar la Competencia Digital percibida por los docentes y su capacidad para utilizar dispositivos digitales en el aula. El objetivo de este estudio es investigar los recursos tecnológicos y las dificultades que tienen los profesores de Educación Física en los centros educativos, además de la formación y las estrategias metodológicas necesarias para impartir adecuadamente las clases de Educación Física en los tiempos actuales.

Para ello, a través de una encuesta previamente validada, observaremos la Competencia Digital del profesorado y si existen diferencias entre géneros, según edad y experiencia docente. Se ha realizado una encuesta a 50 profesores de Educación Física de alumnos de secundaria. Los resultados muestran diferencias estadísticamente significativas según la experiencia docente y la edad. Además, los profesores más jóvenes tienen una mejor percepción de su capacidad para aplicar la Competencia Digital en el aula de Educación Física.

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SPAIN



Article

Technological revolution of the last few decades has brought an enormous global transformation in all sectors of society. The school environment has not been oblivious to this revolution, and there is a broad consensus in the educational field that Information and Communication Technologies - ICT: computers and peripherals like scanner and printer, interactive whiteboards, devices for recording and editing audio, video and other multimedia supports such as iPads or tablets - are inherent into today's culture and, therefore, must be meaningfully integrated into all areas of the curriculum.

Digital Competence is a key ability to promote lifelong learning. ICT play a key role in the education sector, producing new demands and changes that significantly affect teachers, mainly generating a constant need for training and updating. Several studies highlight that the use of ICT in educational practice has not yet reached desirable levels. This is because many didactic processes implemented with the use of technological devices do not show a clear and true innovation or learning increase compared with traditional teaching and learning ways. →

SPAIN

Indeed, in most cases new technologies are incorporated into schools without having a well-founded pedagogical project based on the transversality of ICT. Moreover, teachers are not provided with the optimal training needed to carry out this process. Therefore, insignificant modifications are made in the way of teaching and learning, as in many cases both teachers and students are used to traditional teaching methods.

In 2021, a study published by a group of researchers at the Catholic University of Valencia in Spain analysed the Digital Competence perception from Physical Education teachers in Secondary School, considering three relevant variables: age, gender and teaching experience.

During three weeks between April and May of the 2020-2021 academic year, they collected data from 50 physical education teachers (34 men and 16 women) working in secondary schools. The average age of the teachers surveyed was 40 years, with ages ranging from 26 to 58 years.

They used a questionnaire of 21 questions to measure what these physical education teachers thought about digital competence and then applied different statistical methods to analyze their responses.

The questionnaire showed that Physical Education teachers prove to have a high level of basic knowledge of how a computer, iPad or similar works, yet both male and female Physical Education teachers had a lower score in terms of knowing different methodologies for working in a technological environment. There were no significant differences between men and women in terms of digital competence in the area of Physical Education, however there were significant differences according to the age and teaching experience of male and female teachers.



LITHUANIA

The future of Smart Cities: the need for effective decision-making tools

Mills D, Pudney S, Pevcin P, Dvorak J, "Evidence-Based Public Policy Decision-Making in Smart Cities: Does Extant Theory Support Achievement of City Sustainability Objectives?", *Sustainability*, 2022; 14(1), 3

Abstract

Evidence-based decision making is promoted as offering efficiency and effectiveness; however, its uptake has faced barriers such as underdeveloped supporting culture, limited access to evidence, and evidence that is not fully relevant. Smart city conceptualizations offer economic and environmental sustainability and better quality of life through evidence-based policy decision-making. We wondered whether smart city theory and practice has advanced the knowledge of evidence-based decision-making. We searched major databases for literature containing a mention of smart cities, decision-making, and policy. We identified relevant literature from a range of disciplines and supplemented these by following backwards and forwards citations. Evidence-based decision-making was found mostly in literature regarding the theory and practice of smart city operations, and, to lesser extents, the articles regarding policy decisions and tactical decisions.

Better decision-making which supported the achievement of city sustainability objectives was reported in some articles; however, we found significant obstacles to the further achievement of city objectives in the areas of underachievement in collaborative decision-making, privileging of big data evidence, and artificial intelligence agents as decision-makers. We assembled a definition of smart city decision-making and developed an agenda of research which will support city governments, theorists, and practitioners in better achieving sustainability through improved decision-making.

artificial intelligence big data
collaboration decision-making
evidence-based local government
public administration policy
smart city

LITHUANIA

Interview

The article is not the result of experiments, measurements or observations, but a reflection that develops from a study and synthesis of previous publications on the subject. This is what we call a state of the art, something we are not necessarily familiar with, which shows that research is a process that gradually accumulates knowledge and that periodically needs to take stock on this knowledge with prospective articles that do not imply "lab experimentation". Could you tell us more about this study?

Jaroslav Dvorak: We wondered whether smart city theory and practice had advanced the knowledge of evidence-based decision-making. We searched major databases for literature containing a mention of smart cities, decision-making, and policy. We identified relevant literature from a range of disciplines and supplemented these by following backwards and forwards citations.

Evidence-based decision-making was found mostly in literature regarding the theory and practice of smart city operations, and, to lesser extents, the articles regarding policy decisions and tactical decisions. Better decision-making which supported the achievement of city sustainability objectives was reported in some articles; however, we found significant obstacles to the further achievement of city objectives in the areas of underachievement in collaborative decision-making, privileging of big data evidence, and artificial intelligence agents as decision-makers.

Tell us more about how you proceeded to prepare the article and put together your basic corpus. Did you do a bibliographic research using databases, paper and electronic journals? Did you want to be exhaustive or instead be selective given the volume of existing publications? If so, what criteria did you use? Did you use specific tools to speed up this work?



Jaroslav Dvorak
Head of Department of Public Administration
& Political Science

JD: Preparing the article and the research itself took quite a long time because, in the initial version, we collaborated only with my colleague dr. David Mills to prepare an article for a special issue I am coordinating in another magazine. Since the selection and reading of the articles took time, and in addition, we realized that some competencies were missing, we each invited one more co-author who had competencies that we needed. A special software was used for the selection of articles. During our research, we found that algorithm-based decision-making in the smart city context is examined in the literature on urban management, urban planning, and transportation and mobility. This means, in the future, AI will be used even more widely and intensively in decision-making.

Your article is at the intersection of two subjects: on the one hand, "Evidence-based policy decision making" and on the other hand, "Smart cities". Evidence-based policy making is not really a discipline, but rather a process that involves gathering and analysing evidence to inform decision makers. →

GREECE

Malpigmentation of Common Sole affect gene transcription

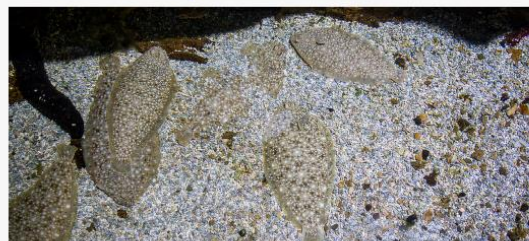
Kavouras Menelaos, Emmanouil E. Malandrakis, Ewout Blom, Kyriaki Tsiatika, Theodoros Danis, Panagiotis Panagiotaki, and Athanasios Exadactylos. 2021. "Malgpigmentation of Common Sole (*Solea solea*) during Metamorphosis Is Associated with Differential Synaptic-Related Gene Expression" *Animals* 11, no. 8: 2273.

Abstract

Common sole (*Solea solea*) is an important species for the aquaculture industry. Defects in pigmentation of the species are very common during rearing. Differences in gene expression between normally pigmented juveniles and those that present both sides full pigmented, ocular and blind, were investigated. Differentially expressed transcripts were functionally annotated, and gene ontology was carried out.

The results indicated that ambicolorated juveniles showed a significant upregulation of genes involved in the signal transmission at the synaptic level and regulation of ion channels, affecting the plasticity and the development of the synapses, as well as the transmission of signals or ions through channels.

Solea solea
next-generation sequencing
pigmentation ambicoloration
ion channels synapses



Article

In a research published in 2021, a group of researchers including Menelaos Kavouras from the University of Thessaly and Emmanouil Malandrakis from the Agricultural University of Athens in Greece investigated the differences in gene transcription levels between normal and ambicolorated (both sides pigmented) common sole individuals, to identify biological and molecular pathways that affect the pigmentation process.

Flatfish display a chromatic asymmetry: the mild to dark coloration of the ocular (upper) side aims to conceal and make them difficult to track by emulating the shades of the seafloor environment. Flatfish also present a lower "blind" side, which is usually white. This chromatic pattern appears during the metamorphosis, a stage during which the eyes also migrate to the upper side.

Defects in pigmentation of the species are very common in farmed conditions. External factors such as stress conditions, dietary composition, and endocrine disorders are also related to the pathways involved in pigmentation, provoking malpigmentation such as ambicoloration (both sides are fully pigmented), pseudo-albinism (depigmentation of the upper side), and hypermelanosis (blind side presents dark spots).

In order to investigate the differences in gene transcription levels between normal and ambico-

lored individuals, the researchers extracted RNA from 9 normal pigmented individuals and 9 ambicolorated ones. The samples were chosen from a population that has been controlled and acclimated since the larval stage.

This research pointed out the link between pigmentation and crucial functions of the central nervous system, but also the transport through ionic channels, muscular and cardiac function, and others. The association of pigmentation with the development of the nervous system, suggests that it is easily disrupted since the beginning of development.

Deviation from normal pigmentation has an impact on the survival of the species in the marine environment, as well as on the sale price of the farmed animals. Anomalies in chromatic patterning are rarely seen in the wild flatfish population.

Better farming conditions for soles comes from understanding biological and molecular pathways. And better farming conditions means a higher survival rate, and less expensive common soles for the customer. ■

[Read the scientific paper >](#)

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IRELAND

Linking for Longevity: The Durability Factor in Submarine Power Cables

C. Poon, S.M. O'Halloran, A. Connolly, R.A. Barrett, S.B. Leen, "Fretting wear and fatigue in submarine power cable conductors for floating offshore wind energy", *Tribology International*, Volume 186, 2023, 108598, ISSN 0301-679X

Abstract

Multi-strand, copper conductors in submarine power cables (SPCs) for offshore wind are susceptible to fretting wear and fatigue, due to multiplicity and complexity of contacts, subjected to potentially severe dynamic loading. This paper presents (i) a global-local methodology for coupled hydro-aero-elastic dynamic loading of a representative SPC for identification of local inter-wire fretting-related conditions, (ii) fretting wear characterisation of copper conductor material, and (iii) local fretting multiaxial wear-fatigue finite element models for fretting fatigue life assessment of SPC copper conductor contacts.

Predicted fretting fatigue lives are shown to be consistent with previously published bending fatigue test data on SPC copper conductors. Fretting fatigue life is shown to be significantly affected by aero-hydrodynamic loading, wear, slip regime and wire diameter.

Fretting Fatigue Fretting wear
Life prediction Finite element models
Submarine Power Cables
Offshore renewable wind



Article

In a study that could revolutionise the renewable energy sector, a team of researchers has made significant strides in understanding the wear and surface damage of submarine power cables used in offshore wind energy systems. This research is a collaboration between researchers in the University of Galway led by Seán B. Leen, and Sinéad O'Halloran at South East Technological University in Waterford and includes industry partners, Wood plc.

Offshore wind turbines, floating in the sea, are a promising source of clean energy. But the power they generate needs to be transmitted to the grid through submarine power cables. These cables face a lot of stress and friction, leading to wear and cracking over time. The team's research delves deep into this issue, aiming to make these cables more durable and efficient.

The researchers developed a four-step computer simulation to predict how these cables behave under various conditions. They conducted simulations of the cables at four different scales under different wind speeds to see how much tension and bending the power cables could withstand. Think of it as a virtual stress-test for power cables. This model helps them understand how much resistance the cables face when parts rub against each other.

But the team didn't stop at simulations. They put their theories to the test with real-world materials and tested copper used in the cables to measure its friction and wear parameters under different conditions.

The study also provides a handy guide to the different types of cables used in offshore wind energy. Some cables are designed to stay put or be buried under the seabed, while others need to be flexible to connect moving platforms.

So, why does all this matter to you and me? Well, more durable and efficient power cables mean offshore wind farms can transmit more power, more reliably. This can lead to lower energy costs, more stable power supply, and a big step forward in our shift away from fossil fuels. In the fight against climate change, every bit of efficiency counts!

In a world increasingly turning to renewable energy, this research is not just about power cables. It's about powering our future in a sustainable way. ■

[Read the scientific paper >](#)

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