

UČNI NAČRT PREDMETA / COURSE SYLLABUS

Predmet:	VAROVANJE MORSKEGA OKOLJA
Course title:	PROTECTION OF THE MARINE ENVIRONMENT

Študijski program in stopnja Study programme and level	Študijska smer Study field	Letnik Academic year	Semester Semester
Varstvo okolja in ekotehnologije, 2. stopnja	/	2.	/
Environmental Protection and Eco-technologies, 2 nd level	/	2 nd	/

Vrsta predmeta / Course type Izbirni predmet / Optional course

Univerzitetna koda predmeta / University course code: VMO

Predavanja Lectures	Sem. vaje Tutorial	Lab. vaje Laboratory work	Teren. vaje Field work	Samost. delo Individ. work	ECTS
20	10	/	10	80	4

Nosilec predmeta / Lecturer: doc. dr. Natalija Špeh

Jeziki /	Predavanja / Lectures:	Slovenščina / Slovenian
Languages:	Vaje / Tutorial:	Slovenščina / Slovenian

Pogoji za vključitev v delo oz. za opravljanje študijskih obveznosti:

Pogojev ni.

Prerequisites:

No formal prerequisites.

Vsebina:

Predmet obravnava značilnosti (ob)morskega okolja, človekove pritiske in tehnike varovanja morja z vidika fizične geografije, tj. geomorfne procese morja, aktualne okoljske izzive v zvezi z onesnaževanjem in rabo (ob)morskega prostora.

Poglavitne teme:

1. Uvod: Regionalizacija–globalna opredelitev/pregled oceanov, pomen in kakovost morja in onesnaženja
2. Obremenjevanje morskega in obalnega okolja: vrste pritiskov (pregrevanje, emisije, gradnja na obalah), vzroki, spremljanje, ukrepi
3. (Ob)morsko okolje in zakonodaja
4. Praktični del: terenske metode, GIS simulacije

Content (Syllabus outline):

The course addresses the characteristics of the marine and coastal environment, human pressures, and marine protection techniques from the perspective of physical geography, i.e., the geomorphological processes of the sea, and current environmental challenges related to pollution and the use of marine and coastal space.

Main topics:

1. Introduction: Regionalization – global overview/definition of oceans, importance and quality of the sea, and marine pollution.
2. Pressures on the marine and coastal environment: types of pressures (overheating, emissions, building in coastal zone), causes, monitoring, and mitigation measures.
3. Marine and coastal environment and legislation.
4. Practical session: fieldwork methods, GIS simulations.

Temeljna literatura in viri / Textbooks:

Obvezna / Required:

1. Izročki predavanj, seminarjev
2. Wijesinghe, S.M.K., Karunarathna, B.G.H.D., Kumarawansa, W.K.M.G. et al. Marine pollution: the global challenge of ocean contaminants and mitigation efforts. *Anthropocene Coasts* 9, 5 (2026). <https://doi.org/10.1007/s44218-025-00107-8>
3. Krishna S, Lemmen C, Örey S, Rehren J, Pane JD, Mathis M, Püts M, Hokamp S, Pradhan HK, Hasenbein M, Scheffran J and Wirtz KW (2025) Interactive effects of multiple stressors in coastal ecosystems. *Front. Mar. Sci.* 11:1481734. doi: 10.3389/fmars.2024.1481734

Priporočena / Recommended:

1. Webb, Paul (2023). *Introduction to Oceanography*. Roger Williams University, Pressbooks.
2. Horvat, M., Kovačić, M. & Bajt, O. (2025). Contribution to the Research on Marine Environment Pollution from Nautical Tourism Vessels. *Pomorski zbornik*, 65 (1), 49-60. Retrieved from <https://hrcak.srce.hr/330002>

Cilji in kompetence:

Predmetno specifični cilji in kompetence:

- naravnogeografska analiza prostorskih pojavov v (ob)morskem okolju,
- kritično presojanje okoljskih virov in podatkovnih baz,
- uporaba GIS-a in kartografskih tehnik pri analizi onesnaženja,
- razumevanje zakonodaje in mednarodnih smernic (npr. MARPOL, Direktiva o morski strategiji).

Splošne kompetence:

- Sodelovanje pri uporabi specifičnega raziskovalnega orodja/instrumentov.

Objectives and competences:

Specific competences:

- Physical-geographical analysis of spatial phenomena in the marine and coastal environment.
- Critical evaluation of environmental resources and databases.
- Use of GIS and cartographic techniques in pollution analysis.
- Understanding of legislation and international guidelines (e.g., MARPOL, Marine Strategy Framework Directive).

General competences:

- Participation in the use of specific research tools/instruments.

Predvideni študijski rezultati:

Znanje in razumevanje:

Študent bo ob zaključku predmeta sposoben razumeti:

- fizičnogeografski pristop k preučevanju morja in njegovo onesnaženje.
- osnovne naravnogeografske procese v oceanu in priobalju,
- spoznali vrste onesnaženja morja (kemijsko, biološko, fizikalno, mikroplastika),
- analizirali vpliv podnebnih sprememb na morski ekosistem,
- ovrednotili učinke rabe morskega prostora (turizem, promet, ribolov),
- prepoznali ključne probleme upravljanja obalnega območja.

Prenosljive/ključne spretnosti in drugi atributi:

Intended learning outcomes:

Knowledge and understanding:

At the end of the subject, student will be able:

- Physical-geographical approach to the study of the sea and its pollution.
- Basic physical-geographical processes in the ocean and coastal zones.
- Identified types of marine pollution (chemical, biological, physical, microplastics).
- Analyzed the impact of climate change on the marine ecosystem.
- Evaluated the effects of marine space use (tourism, transportation, fishing).
- Recognized key issues in coastal zone management.

Transferable/key skills and other attributes:

<ul style="list-style-type: none"> • razvili sposobnost samostojnega raziskovanja in analiziranja okoljskih podatkov, • oblikovali predloge za trajnostno upravljanje in zaščito morskega okolja. 	<ul style="list-style-type: none"> • Developed the ability to conduct independent research and analyze environmental data. • Formulated proposals for sustainable management and protection of the marine environment.
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Metode poučevanja in učenja:

Oblike dela:

Poučevanje bo organizirano kot individualno delo, spletno (e-učenje), razredno in mešano učenje (blended learning)

Kombinirane metode poučevanja/učenja:

- predavanja in razlaga s študijami primera; komparativna analiza z diskusijo, seminar/samostojno delo;
- doživljajsko (izkustveno) poučevanje/terensko delo;
- sodelovanje v projektnem delu kot aktivni obliki študija;
- vključevanje tujih študij primerov; gostujočih predavateljev in Erasmus študentov.

Learning and teaching methods:

Forms of teaching:

Teaching will be organized as individual work, online learning (e-learning), classroom-based instruction, and blended learning.

Teaching methods:

Combined Teaching and Learning Methods consist of:

- Lectures and explanations with case studies; comparative analysis with discussion; seminars/independent work.
- Experiential learning / fieldwork.
- Participation in project work as an active form of study.
- Incorporation of international case studies; visiting lecturers; and Erasmus students.

Načini ocenjevanja:	Delež (v %) / Weight (in %)	Assessment:
<p>Pogoj za pristop k izpitu:</p> <ul style="list-style-type: none"> • opravljene terenske in samostojne vaje/seminar. <p>Kot končna ocena je predviden pisni izpit.</p> <p>Ocenjevalna lestvica:</p> <ul style="list-style-type: none"> • zadostno 6: 60–67 % • dobro 7: 68–75 % • prav dobro 8: 76–83 % • prav dobro 9: 84–90 % • odlično 10: 91–100 % 		<p>A prerequisite for access to the exam: Completed fieldwork and independent assignments/seminar.</p> <p>The final assessment is a written examination.</p> <p>Grading scale:</p> <ul style="list-style-type: none"> ▪ Sufficient D (6): 60–67% ▪ Good C (7): 68–75% ▪ Very good B (8): 76–83% ▪ Very good B+ (9): 84–90% ▪ Excellent A (10): 91–100%

Materialni pogoji za izvedbo predmeta :

- Predavalnica z LCD projektorjem,
- Računalniška učilnica (seminarske vaje)
- Osnoven instrumentarij za kazalnike hitrega testa morske vode; merilec slanosti, temperature, električne prevodnosti (EC)

Material conditions for subject realization:

- Lecture room equipped with an LCD projector.
- Computer classroom (for seminar sessions).
- Basic instrumentation for rapid seawater quality indicators: salinity meter,

temperature probe, and electrical conductivity (EC) meter.

Obveznosti študentov:

1. Izdelava in zagovor seminarske vaje.
2. Opravljene terenske vaje.
3. 90-odstotna udeležba na seminarskih vajah.
4. Pisni izpit.

Student's commitments:

1. Preparation and oral presentation (defence) of a seminar paper.
2. Completion of fieldwork exercises.
3. At least 90% attendance in seminar sessions.
4. Written examination.

Reference nosilca predmeta:

Pedagoško delo:

- 2008–2025: nosilka in izvajalka predmetov na dodiplomskem študiju Varstvo okolja in ekotehnologije (Vrednotenje in varstvo geografskega okolja, Razvoj podeželja) ter podiplomskem študiju Varstvo okolja in ekotehnologije (Trajnostno ravnanje s pokrajinskimi viri)
- 2011–2012: Vsebinska zasnova in koordinacija dveh mednarodnih poletnih šol VŠVO, hkrati z vodenjem raziskovalne skupine
- 2012: soorganizacija produkcije SUSTainART, razstave v okviru mednarodnega programa Evropska prestolnica kulture;
- Gostujoča predavateljica: Univerza v Reki (2024); Univerza v Zadru (2019, 2018, 2017); Univerza v Zagrebu (2016); Worcester University (2014); mednarodna poletna šola Univerze v Oslu (UiO, 2014); ERASMUS poletna šola v Portu (ISEP, 2010);
- Vodenje senata in koordinacija pedagoškega procesa na VŠVO (2006–2013);
- Učno gradivo za 3 predmete (<https://vis.fvo.si/>) (2023; 2024)
- Učbenik za tuje študente: From Ecological Footprint to Integral Model of Sustainable Evaluation, Scholars' Press, 2019.
- ŠPEH, Natalija, ŠTERBENK, Emil, PIANO, Saša. Integralni pristop v visokošolskem izobraževanju (uspešna izkušnja na Visoki šoli za varstvo okolja Velenje) = Integral approach in higher education level (Successful experience at the Environmental Protection College Velenje). V: DUH, Matjaž (ur.), et al. *Ekologija v konceptu širših družbenih sprememb*. Maribor: Pedagoška fakulteta; Rakičan: RIS Dvorec. 2016, str. 285–297, ilustr. [COBISS.SI-ID [13897879](#)]
- Soavtorstvo: *Navodila in smernice za izvedbo praktičnega usposabljanja na Visoki šoli za varstvo okolja*. Velenje: Visoka šola za varstvo okolja, 2010. 26 f. [COBISS.SI-ID [1053654](#)]

Lecturer's references:

Pedagogic activities:

- 2008–2025: Course holder and lecturer in the undergraduate programme Environmental Protection and Ecotechnologies (courses: Evaluation and Protection of the Geographical Environment, Rural Development) and in the postgraduate programme Environmental Protection and Ecotechnologies (course: Sustainable Management of Landscape Resources).
- 2011–2012: Concept development and coordination of two international summer schools at the Environmental Protection College (VŠVO), combined with leadership of a research group.
- 2012: Co-organisation of the SUSTainART production and exhibition within the international programme European Capital of Culture.

Visiting Lecturer:

- University of Rijeka (2024);
- University of Zadar (2019, 2018, 2017);
- University of Zagreb (2016);
- Worcester University (2014);
- International Summer School, University of Oslo (UiO, 2014);
- ERASMUS Summer School, Porto (ISEP, 2010).
- 2006–2013: Chair of the Senate and coordinator of the pedagogical process at the Environmental Protection College (VŠVO).
- Teaching materials developed for three courses (available at: <https://vis.fvo.si/>) (2023; 2024).
- Textbook for international students:

From Ecological Footprint to Integral Model of Sustainable Evaluation, Scholars' Press, 2019.

- Špeh, N., Šterbenk, E., Piano, S. (2016): Integral Approach in Higher Education (Successful Experience at the Environmental Protection College Velenje). In: Duh, M. (ed.) et al., *Ecology in the Concept of Broader Social Changes*. Maribor: Faculty of Education; Rakičan: RIS Dvorec, pp. 285–297.

- Mentorstvo na diplomskem in podiplomskem študiju
- Organizacija in izvedba terenskih vaj za domače in tuje študente, gostujoče profesorje na izmenjavah

Znanstveno-raziskovalno delo:

Vodenje ali sodelovanje v mednarodnih, nacionalnih, regionalnih projektih:

- *Podoktorski projekt:* Emisija CO₂ in možnosti trajnostno sonaravne rabe neobnovljivih podzemnih virov
- Towards a monitoring information system for territorial attractiveness and policy management in South East Europe (Transnacionalni program JV Evropa)
- PRAXIS: International Center for Entrepreneurship. Lifelong Learning Programme (EC)
- *Razvojni prostorski potencial Škalskega in Velenjskega jezera,*
- *Solčavsko kot priložnost za ustvarjanje zelenih delovnih mest: primer socialnega podjetja Farovski vrt v Solčavi,*
- *Trajnostno zagotavljanje endogenih vodnih virov – Žegnan studenec,*
- *Hrana za zdravje in delovna mesta,*
- *Povečanje samooskrbe v SAŠA regiji: vzpostavitev tržnih poti,*
- *CEEPUS in ERASMUS tromesečno gostovanje na Univerzi v Zadru; osredotočeno na morski ekosistem 1) onesnaženju morja z odpadki, skupaj z 2) znanstveno-raziskovalnim delom v zavarovanem območju NP Kornati;*
- **GREENGATE** – Odgovorna izbira in zdrava uporaba kozmetičnih izdelkov
- **PLASTIX** – *Plastics Revolution for European Regions (Interreg Europe):* facilitates industrial transition towards a resource
- **STE(A)M** – Promocija študija za poklice prihodnosti s kakovostnimi aktivnostmi in vsebinami za mlade izven javnih univerzitetnih središč
- **Prostorsko in okoljsko degradirana območja zaradi pridobivanja in rabe premoga v Savinjsko-šaleški regiji**
- **NARAVANJE:** Gibanje za bližino narave

Strokovno delo in izbrane strokovne publikacije:

- Strokovni članek (1.04): ŠPEH, Natalija. Odpadki na izbranih odsekih slovenske obale = Waste on selected sections of Slovenian coastline. *Geografija v šoli*. 2023, letn. 31, št. 2/3, str. 78-83, zvd., fotogr. ISSN 1318-

Co-authorship:

- Guidelines and Instructions for the Implementation of Practical Training at the Environmental Protection College. Velenje: Environmental Protection College, 2010.
- Supervision of undergraduate and postgraduate theses.
- Organisation and implementation of fieldwork courses for domestic and international students, as well as visiting professors participating in academic exchange programmes.

Scientific and research work:

- Postdoctoral research project: CO₂ Emissions and Possibilities for Sustainable and Environmentally Sound Use of Non-renewable Subsurface Resources.
- Towards a Monitoring Information System for Territorial Attractiveness and Policy Management in South-East Europe – Transnational Programme South-East Europe.
- PRAXIS: International Center for Entrepreneurship, Lifelong Learning Programme (European Commission).
- Developmental Spatial Potential of Škale Lake and Velenje Lake.
- Solčava region as an Opportunity for Creating Green Jobs: Case study of the social enterprise Farovski vrt in Solčava.
- Sustainable Provision of Endogenous Water Resources – Žegnan Spring.
- Food for Health and Employment.
- Increasing Self-sufficiency in the SAŠA Region: Establishment of Market Supply Chains.
- CEEPUS and ERASMUS three-month visiting mobility at the University of Zadar, focused on the marine ecosystem, including:
 1. marine pollution by waste, and
 2. scientific research activities in the protected area of Kornati National Park.
- GREENGATE – Responsible Choice and Healthy Use of Cosmetic Products.
- PLASTIX – Plastics Revolution for European Regions (Interreg Europe): facilitating industrial transition towards resource efficiency and circular economy principles.
- STE(A)M – Promotion of Studies for the Professions of the Future, through high-quality activities and content for young people outside major public university centres.
- Spatially and Environmentally Degraded Areas Due to Coal Extraction and Use in the Savinja-Šalek Region.
- NARAVANJE – Movement for Closer Connection with Nature.

4717. https://www.zrssi.si/arhiv_clankov/odpadki-na-izbranih-odsekih-slovenske-obale/, DOI: [10.59132/geo/2023/2-3/78-83](https://doi.org/10.59132/geo/2023/2-3/78-83)

- Strokovni prispevek na konferenci (1.13): ŠPEH, Natalija, LONČARIĆ, Robert. Does Settlement Correspond to (Marine) Pollution?. V: GOLEM, Maja (ur.), KUZMIČIĆ ROSANDIĆ, Tea (ur.). *Interdisciplinary conference on waste management priorities – reduce, reuse and recycle : beyond plastic Croatia : book of abstracts*. Split: Association for Nature, Environment and Sustainable Development Sunce, 2022. Str. 16. [COBISS.SI-ID [134682371](https://www.cobiss.si/urn:nbn:si:coibis:134682371)]
- Samostojno poglavje v strokovni monografiji (1.17): ŠPEH, Natalija. Environmental issues with personal care and cosmetic products. V: BUBIK, Anja (ur.), et al. *G-book : educational support for safe and responsible cosmetic product use [created in the project GreenGate]*. Velenje: Faculty of Environmental Protection, 2023. Str. 48-55, ilustr. ISBN 978-961-94349-3-2. <https://green-gate.eu/downloads/G-book-en.pdf>.
- Intervju (1.22) ŠPEH, Natalija (intervjuvanec, fotograf). V Jadranu se znajdejo tako jogiji kot mrtvi psi : doc. dr. Natalija Špeh, okoljska geografinja, o odpadkih v morju. *Nedeljski dnevnik*. 30. okt. 2024, letn. 63, št. 44, str. 18, fotogr. ISSN 1318-0339. [COBISS.SI-ID [219297283](https://www.cobiss.si/urn:nbn:si:coibis:219297283)]...

Priznanja in nagrade:

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Professional work and selected professional publications:

- Professional paper (1.04): ŠPEH, Natalija. Odpadki na izbranih odsekih slovenske obale = Waste on selected sections of Slovenian coastline. *Geografija v šoli*. 2023, letn. 31, št. 2/3, str. 78-83, zvd., fotogr. ISSN 1318-4717. https://www.zrssi.si/arhiv_clankov/odpadki-na-izbranih-odsekih-slovenske-obale/, DOI: [10.59132/geo/2023/2-3/78-83](https://doi.org/10.59132/geo/2023/2-3/78-83)
- Professional conference work (1.13): ŠPEH, Natalija, LONČARIĆ, Robert. Does Settlement Correspond to (Marine) Pollution?. V: GOLEM, Maja (ur.), KUZMIČIĆ ROSANDIĆ, Tea (ur.). *Interdisciplinary conference on waste management priorities – reduce, reuse and recycle : beyond plastic Croatia : book of abstracts*. Split: Association for Nature, Environment and Sustainable Development Sunce, 2022. Str. 16. [COBISS.SI-ID [134682371](https://www.cobiss.si/urn:nbn:si:coibis:134682371)]
- Individual chapter in professional monograph (1.17): ŠPEH, Natalija. Environmental issues with personal care and cosmetic products. V: BUBIK, Anja (ur.), et al. *G-book : educational support for safe and responsible cosmetic product use [created in the project GreenGate]*. Velenje: Faculty of Environmental Protection, 2023. Str. 48-55, ilustr. ISBN 978-961-94349-3-2. <https://green-gate.eu/downloads/G-book-en.pdf>.
- Interview (1.22) ŠPEH, Natalija (intervjuvanec, fotograf). V Jadranu se znajdejo tako jogiji kot mrtvi psi : doc. dr. Natalija Špeh, okoljska geografinja, o odpadkih v morju. *Nedeljski dnevnik*. 30. okt. 2024, letn. 63, št. 44, str. 18, fotogr. ISSN 1318-0339. [COBISS.SI-ID [219297283](https://www.cobiss.si/urn:nbn:si:coibis:219297283)]...

Awards:

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Izbrani znanstveni članki / Selected scientific papers:

Izvirni znanstveni članek (1.01):

- ŠPEH, Natalija, LONČARIĆ, Robert. Marine macro-plastics litter features and their relation to the geographical settings of the selected Adriatic islands, Croatia (2018–2023). *Coasts*. 2025, vol. 5, iss. 2, 14 str., ilustr. ISSN 2673-964X. <https://www.mdpi.com/2673-964X/5/2/13>, DOI: [10.3390/coasts5020013](https://doi.org/10.3390/coasts5020013).
- ŠPEH, Natalija, ČUKA, Anica. Evaluation of landfill sites on Pašman Island and islanders' perceptions regarding waste management issues = Evaluacija odlagališta otpada na otoku Pašmanu i percepcija otočana o problemima gospodarenja odpadom. *Hrvatski geografski glasnik*. 2023, vol. 85, br. 2, str. 47-80, ilustr. ISSN 1331-5854. DOI: [10.21861/HGG.2023.85.02.02](https://doi.org/10.21861/HGG.2023.85.02.02).

Povzetek znanstvenega prispevka (1.12)

- ŠPEH, Natalija. Marine litter : from the Slovenian coast to the Otranto gate. V: SEME, Sebastijan (ur.), SREDENŠEK, Klemen (ur.). *6th International Conference En-Re Energy & Responsibility : [21st of May 2024, Velenje, Slovenia] : book of extended abstracts*. 1st ed. Maribor: University of Maribor, University Press, 2024. Str. 101-102. ISBN 978-961-286-863-5. <https://press.um.si/index.php/ump/catalog/book/874>.
- ŠPEH, Natalija, LONČARIĆ, Robert. The preliminary survey of marine litter on the coasts of Kornati and Elafiti islands (Adriatic sea, Croatia). V: ČUKA, Anica (ur.), OROZ, Tomislav (ur.), KLARIN, Tomislav (ur.). *Islands: nature and cultur : book of abstracts : 18th islands of the world conference : 13th – 17th June 2022, Zadar, Croatia*. Zadar: University of Zadar, 2022. Str. 25-26. ISBN 978-953-331-384-9.

<https://conference.unizd.hr/isisaislands/wp-content/uploads/sites/34/2022/06/Book-of-Abstracts-ISISA-Zadar-2022-1.pdf>. [COBISS.SI-ID 120888835]

- ŠPEH, Natalija, LONČARIĆ, Robert. Jadranski otoci - mogu li endogeni potencijali postati opterećenje za okoliš. V: PERINIĆ LEWIS, Ana (ur.), BLAGAIĆ BERGMAN, Marina (ur.). Klimatske promjene i okolišne budućnosti otoka : simpozij 26. 9. 2022 - 28. 9. 2022 : [knjiga sažetaka] = Climate change and environmental futures of islands : symposium 26. 9. 2022 - 28. 9. 2022 : [book of abstracts]. Zagreb: Institut za etnologiju i folkloristiku; Vis: Anatomija otoka - centar za istraživanje i razvoj, 2022. Str. 51-52. ISBN 978-953-8089-90-9. [COBISS.SI-ID 125098755]
- ŠPEH, Natalija, ČUKA, Anica. Challenges of waste management in isolated coastal environments : the case study of Pašman island, Croatia. V: EUGEO 2021 : 8th EUGEO Congress on the Geography of Europe : June 28 - July 1, 2021, Prague, Czechia : book of abstracts. [Prague]: Faculty of Science of Charles University: Czech Geographical Society, [2021].

Samostojni znanstveni sastavak/poglavje v monografiji (1.16)

- ŠPEH, Natalija, LONČARIĆ, Robert, BREZNIK, Kristijan, SURIĆ, Maša. Burden of the Coastal Area with Solid Waste in Kornati National Park (Croatia). V: KREVS, Marko (ur.). *Hidden geographies*. Cham: Springer Nature, cop. 2021. Str. 153-170, ilustr., zvd. Key challenges in geography. ISBN 978-3-030-74589-9. ISSN 2522-8420. DOI: [10.1007/978-3-030-74590-5_7](https://doi.org/10.1007/978-3-030-74590-5_7).