LIFE Integrated projects 2018

Stage 1 - Concept Note (CN) forms

LIFE 2018	FOR ADMINISTRATION USE ONLY LIFE18 IPE

PROJECT

Project title (*max. 120 characters*):

Life Integrated Project on Leveraged Integration of Marine Environmental Sustainability through Technological Optimization of Natural Water Ecosystems

Project acronym (*max. 25 characters*): **LIFE IP- LIMESTONE**

The project will be implemented in the following Country(ies) and/or Administrative region(s):

ITE 3 – Marche (Italy)

ITF 3 – Campania (Italy)

ITF 4 – Puglia (Italy)

ITF 6 – Calabria (Italy)

HR03 - Jadranska Hrvatska (Croatia)

PT2 – Autonomous Region of the Azores (Portugal)

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Expected start date: 1 November 2019 Expected end date: 1 November 2025

PROJECT POLICY AREA

You can only tick one of the following options:

LIFE Integrated Project Nature: Integrated project implementing prioritised action frameworks pursuant to Article 8 of the Habitats Directive which may include Green Infrastructure actions that contribute to the coherence of the Natura 2000 network in a cross-border context ☐

LIFE Integrated Project Environment: Integrated project implementing:

- waste management plans pursuant to Article 28 of the Waste Framework Directive ■
- river basin management plans pursuant to Annex VII to the Water Framework Directive ☐
- air quality plans pursuant to the Air Quality Directive or national air pollution control programmes pursuant to the National Emission Ceilings Directive. ☐

The project aims at implementing the following plan/strategy (***full copy is to be provided in attachment***):

- Regional Plan for the Reduction of Marine Litter – Marche Region (https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=2ahUKEwiG1rewhqDdAhXKMywKHVyWCJgQFjACegQICBAC&url=http%3A%2F%2Fwww.consiglio.marche.it%2Fbanche_dati_e_documentazione%2Fleggirm%2Fleggi%2Fpdf%2Fvig%2F2034&usg=AOvVaw3D_3YF9EML0yNk9KxRKg_k)

- Regional Waste Management Plan – Marche Region (http://www.consiglio.marche.gov.it/banche_dati_e_documentazione/iter_degli_atti/paa/pdf/d_am98_9.pdf)
- Regional Hydrogeological Management Plan – Marche Region (http://www.regione.marche.it/Regione-Utile/Paesaggio-Territorio-Urbanistica-Genio-Civile/Autorit%C3%A0-di-bacino#11405_Delibere-Comitato-Istituzionale)
- Regional Waste Management Plan – Puglia Region (http://partecipazione.regione.puglia.it/file/piano-rifiuti/documento-proposta-piano-19062018-01.pdf)
- Regional Waste Management Plan – Calabria Region (http://old.regione.calabria.it/abr/index.php?option=com_content&task=view&id=428&Itemid=282)

- Regional Hydrogeological Management Plan – Calabria Region (http://old.regione.calabria.it/ambiente/index.php?option=com_content&task=view&id=1429&Itemid=1)

- Regional Waste Management Plan – Campania Region
- Strategic Plan 2014-2020 for the Azores (http://ec.europa.eu/regional_policy/sources/activity/outermost/doc/plan_action_strategique_eu2020_acores_en.pdf)
- Regional Waste Management Plan – Puglia Region (http://partecipazione.regione.puglia.it/file/piano-rifiuti/documento-proposta-piano-19062018-01.pdf)
- Croatian National Waste Management Plan (https://www.hgk.hr/documents/prezentacijaradovicjosic458ecda6314806.pdf)

fonte: http://burc.regione.campania.it

BENEFICIARIES

Name of the **coordinating** beneficiary (1): Consorzio di Bonifica delle Marche

Name of the associated beneficiary (2): Marche Region

Name of the associated beneficiary (3): Campania Region

Name of the associated beneficiary (4): Puglia Region

Name of the associated beneficiary (5): Calabria Region

Name of the associated beneficiary (6): Ministry of Environment of Croatia

Name of the associated beneficiary (7): Autonomous Region of the Azores

Name of the associated beneficiary (8): UNCEM

Name of the associated beneficiary (9): Metropolitan City of Reggio Calabria

Name of the associated beneficiary (10): Assogal

(Continue as necessary, noting that further beneficiaries can be added later with the full proposal)

PROJECT BUDGET AND REQUESTED EU FUNDING

Total integrated project budget:	42.000.000 €
Total eligible project budget:	21.000.000 €
EU LIFE financial contribution requested:	12.000.000 € (= 58% % of total eligible budget)

Coordinating Beneficiary Profile Information			
Short Name	CBM	**Beneficiary n°**	1

Legal information on the Coordinating Beneficiary			
Legal Name	Consorzio Bonifica Marche	**Legal Status**	
VAT No	02532390412	**Public body**	X
Legal Registration No	REA PU 189665	**Private commercial**	
Registration Date	17/06/2013	**Private non- commercial**	

Legal address of the Coordinating Beneficiary					
Street Name and No	Via Guidi 30			**PO Box**	
Post Code	61121	**Town/City**	Pesaro		
Country Code	IT	**Country Name**	Italy		

Coordinating Beneficiary contact person information			
Function	Coordinator for International Projects		
Surname	Maiani	**First Name**	Michele
E-mail address	segreteria@bonificamarche.it		
Department / Service	Bonifica Marche Service		
Street Name and No	Via Guidi 30	**PO Box**	
Post Code	61121	**Town/City**	Pesaro
Country	Italy		
Telephone No	+ 39 072131002	**Fax No**	+39 0541 978401

Coordinating Beneficiary details	
Website	https://www.bonificamarche.it/

Brief description of the Coordinating Beneficiary's activities and experience in the area of the proposal

CBM is a public body, fully owned by Marche Region. Its activity is aimed at implementing the River Basin Management Plans for the 7 rivers in Marche Region and at controlling the quality of water, even by adopting measures to reduce plastic and microplastic pollution from rivers to the sea.

Marche Region supported LIFE 2014-2020 projects PRIMES (http://www.lifeprimes.eu), SEC-ADAPT (http://www.lifesecadapt.eu) and the INTERREG Projects PREWASTE (http://www.ambiente.marche.it/Portals/0/Ambiente/Rifiuti/PW_Traduzione/Pre-waste_Draft_Common_MethodologyMalta.pdf), BID-REX (https://www.interregeurope.eu/bid-rex/) and WIDE (http://wide.regione.marche.it/CMS_SVIM_WEB/default.aspx?pag=0&lang=it)

CBM is also a member of ANBI, the umbrella organization of 150 Consorzi di bonifica e di irrigazione (Drainage and Irrigation Boards) in Italy working on a surface of 17 million hectares –59% of all Italian surface- including all plains, great part of the hills and some mountain areas. CBM's tasks are: hydrogeological protection (from landslides and floods), safeguard and maintain waters, even for irrigation uses, protection of environment, producing also renewable energies.CBM is a democratic board self-governing within European and Constitutional principles of subsidiarity; they are also an example of fiscal federalism as they invest their fees in their districts. The annual budget managed by CBM, derived from its own resources, is around 30 Million Euros, that are reinvested in water management solution and to support research and innovation related to water quality.

CBM is also a member of EUWMA (European Union of Water Management Associations) that is the umbrella organization of the Drainage and Irrigation Boards, existing in nine Countries (Belgium, Holland, France, United Kingdom, Hungary, Portugal, Spain, Italy and Germany) and covering a total surface of 56 million hectares.

Due to its role, CBM can assure also exploitation at national and EU scale of the results of the LIFE IP LIMESTONE.

CBM developed and tested drones-, sensors-, nanotech sponges -, and algae- based solutions to early detect, restore and manage plastic pollution and riverine litter. These solutions, till now applied at river and lake scale – will be implemented also in sea and shores environments, in application of the new Regional Law, approved in August 2018 by Marche Region, for the reduction of Marine Litter. The law was approved in adoption of the Waste Management Regional Plan and of the UNEP and EU Directives addressing Plastic Reduction and Integrated Coastal and River Management Approach.

CBM has also a long-term expertise in capacity building, stakeholders-mapping/enabling and management and in policy advice to EU, national and regional institutions and Managing Authorities.

In 2016 CBM launched its first Water Innovation Day to support Open Innovation and creation of start-up enterprises in addressing innovative solutions for riverine litter and integrated coastal and river management.

CBM supported 10 selected start-ups and cooperates with 18 different Universities and Research Centres.

CBM is also Intermediate Body for the implementation of EARDF Marche Regional Operational Programme related to watercourses management and to riverine litter.

COORDINATING BENEFICIARY DECLARATION

The undersigned hereby certifies that:

My organisation *(add name)* **Consorzio di Bonifica Marche** has not been served with bankruptcy orders, nor has it received a formal summons from creditors. My organisation is not in any of the situations listed in Articles 106(1) and 107 of Council Regulation No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union (OJ L298 of 26.10.2012).

1. My organisation is legally registered in the European Union.

I am legally authorised to sign this statement on behalf of my organisation.

I have read in full the LIFE Model Grant Agreement and the Financial and Administrative Guidelines provided with the LIFE application files.

I certify to the best of my knowledge that the statements made in this concept note are true and the information provided is correct.

At Pesaro on September 4, 2018

Signature of the Coordinating Beneficiary:

Name(s) and status of signatory: Avv. Claudio Netti, President

SUMMARY DESCRIPTION OF THE PROJECT

1. Overall context/background/geographical scope

IP itself

Marine litter or debris consists of a *range of materials* including plastic, metal, wood, rubber, glass and paper. Although the relative proportions of these materials vary according to the regional sea concerned, there is clear evidence that plastics are by far the most abundant type of debris in terms of the number of items (Ryan et al, Browne et al). In some locations, plastics amount to 80 % of marine litter on shorelines (OSPAR 2007; STAP 2011). A similar predominance of plastic is reported from sampling at the sea surface and the sea bed (Barnes *et al.* 2009; STAP 2011).

Most plastics are extremely durable materials and are likely to persist in the marine environment for a considerable period, possibly as much as hundreds of years. However, plastics also deteriorate and fragment in the environment as a consequence of exposure to sunlight (photo-degradation) in addition to physical and chemical deterioration, which is likely to result in numerous tiny plastic fragments called micro-plastics.

As a material type, plastics debris consists of a wide range of items with *diverse sources* from different applications including (nylon) fishing gear, food and beverage packaging, smoking related items (disposable lighters, filters, cigar tips), transport packaging waste (pallets, plastic sheeting and straps), feedstock for plastic production (pre-production pellets and powders) and sewage related debris (sanitary towels, tampons, plastic cotton wool bud sticks) (Kershaw et al. 2011; OSPAR 2007; STAP 2011).

Litter from *land-based activities* is washed by rain or by snowmelt, is blown by the wind, or is discharged into nearby waterways or seas. A variety of pathways have been identified including material carried by rivers or flood water or discharged via industrial and municipal outfalls.

Marine litter inputs are also associated with poor solid waste management practices, especially where material is dumped or abandoned in or adjacent to rivers or the sea.[1] Waste management facilities, including waste transport to such facilities, may also act as sources of debris where such sources are inadequately constrained and confined – by burial and fences for example – in order to prevent it being blown into water courses.

There may even be direct inputs from industry, where for example there has been a spillage of pre-production pellets used as feed stock for plastic production or in cases of debris associated with the decommissioning of ships on or near the shoreline.

Moreover, visitors to our coasts leave a considerable amount of litter on the shore (Barnes *et al*. 2009; OSPAR 2007; STAP 2011; UNEP 2006).

Various human *activities at sea* generate litter, including shipping[2] and fixed installations such as mining and oil extraction platforms as well as aquaculture facilities. The types of litter include illegally dumped waste, commercial and recreational fishing related debris (e.g. fishing gear) and discharges from toilets and showers, which include sewage related debris such as tampons, sanitary towels and condoms.

Marine litter is found in a wide range of locations. Items washed ashore are the most prominent signs of marine litter but most of the litter entering the water is found on the sea floor, both in shallow

[1] A MED POL assessment identified direct waste disposal by households, followed by the impact of tourist facilities and run-off from waste dumps, as the main sources of litter in the Mediterranean. Regional Seas Coordinating Office, UNEP, Nairobi of April 2005.

[2] Shipping for transport of cargo or passengers (commercial, recreational or military), for fishing (commercial or recreational) or for research.

and deep water while the remainder floats on the surface.[3] It is estimated that 15% of marine debris floats on the sea surface, 15% remains in the water column and 70% rests on the seabed (UNEP, 2005). It is also important to underline that marine litter transcends national borders. The international dimension is crucial because Europe's seas are shared and marine litter can travel long distances.

Despite international, EU and national efforts to reduce the quantity of litter released into our seas over last two decades, in many regions such as the Adriatic and the Mediterranean, quantities of litter, especially plastic, are increasing. This is due in part to an exponential increase in the quantity of end-of-life plastic that has been generated and the low recycling and incineration rate thereof[4], coupled with exceptionally slow degradation of plastic litter, if at all. Italy and Southern Italy Regions are among the main producers of marine litter pollution, when considering data per inhabitants.

Country	Coastal population[1]	Waste generation rate [kg/person/day][2]	% Plastic in waste stream[2]	% Inadequately managed waste[2]	Waste generation [kg/day]	Plastic waste generation [kg/day]	Inadequately managed plastic waste [kg/day][4]	Plastic waste littered [kg/day][4]
Albania	2 530 533	0,77	9	45	1 948 510	174 392	77 897	3 488
Algeria	16 556 580	1,2	12	58	19 867 896	2 374 214	1 378 693	47 484
Bosnia/Herzegovina	585 582	1,2	12	40	702 698	83 972	33 813	1 679
Croatia	1 602 782	2,1	12	9	3 365 842	402 218	37 053	8 044
Cyprus	840 556	2,07	12	0	1 739 951	207 924	831	4 158
Egypt	21 750 943	1,37	13	67	29 798 792	3 858 944	2 572 170	77 179
France	17 287 280	1,92	10	0	33 191 578	3 302 562	0	66 051
Greece	9 794 702	2	10	0	19 589 404	1 949 146	0	38 983
Israel	6 677 810	2,12	14	1	14 156 957	1 974 896	12 577	39 498
Italy	33 822 532	2,23	6	0	75 424 246	4 487 743	0	89 755
Lebanon	3 890 871	1,18	8	34	4 591 228	365 003	123 700	7 300
Libya	4 050 128	1,2	12	23	4 860 154	580 788	132 985	11 616
Malta	404 707	1,78	12	6	720 378	86 085	5 456	1 722
Monaco	34 050	2,1	12	0	71 505	8 545	0	171
Montenegro	260 336	1,2	12	30	312 403	37 332	11 353	747
Morocco	17 303 431	1,46	5	66	25 263 009	1 250 519	824 650	25 010
Gaza	3 045 258	0,79	8	6	2 405 754	191 257	11 515	3 825
Slovenia	336 594	1,21	12	1	407 279	48 670	550	973
Spain	22 771 488	2,13	13	0	48 503 269	6 281 173	0	125 623
Syria	3 621 997	1,37	13	65	4 962 136	642 597	419 763	12 852
Tunisia	7 274 973	1,2	12	60	8 729 968	1 043 231	621 077	20 865
Turkey	34 042 862	1,77	12	16	60 255 866	7 200 576	1 187 323	144 012
Total/mean	208 519 478	2	11	23	360 939 138	36 560 188	7 451 413	731 036

The LIFE IP LIMESTONES will cover 4 different Italian Regions, the Autonomous Region of the Azores and the Marine Protected Areas of Croatia with the aim to exploit and test innovative technological solutions that can support integrated policies and management plans to prevent, manage, restore natural ecosystems affected by riverine and marine litter.

Transnational cooperation and capitalization of previous projects addressing marine litter will be a crucial factor to successfully implement a common strategy for marine litter reduction, as the persistence of this problem results from both a lack of global and regional strategies and deficiencies of existing international, national and regional programmes, regulations and standards.

The fact that the selected pilot areas where the LIFE IP is to be developed are spatially distinct (without physical continuity), is not an argument to use different principles and methodologies. Moreover, the comprehension of how differing realities exist when apply the same method and tools will help in making both the EU Plastic and Litter Prevention Strategy and the Integrated River and Coastal Management Plans and IZCM to be improved as regulatory frameworks and as processes.

[3] The "garbage patches" in the North Pacific, but also in the Atlantic Ocean are area's of marine debris concentration that are often referred to. The name "garbage patch" is a misnomer, as there is no island of debris that can be seen with satellite or aerial photographs, because much of the debris is small bits of floating plastic.

[4] Plastic Waste in the Environment, revised final report, European Commission, April 2011, http://ec.europa.eu/environment/waste/studies/pdf/plastics.pdf

Complementary actions

Marine and Riverine Litter Pollution (MRL) affects natural ecosystems by multidimensional impacts: it causes serious environmental and health problems with the possible transfer of toxic chemicals to marine, river and human habitats. The complementary actions to LIFE IP LIMESTONE arise from the need of creating a convergence of some elements to: a) develop skills and trans-national professional profiles to support public agencies in early adoption of disruptive solutions to reduce Marine and Riverine Litter; b) integrate the shared DPSIR conceptual framework (according to EU-EAA DPSIR model) to innovate infrastructures and technologies for data sharing, harmonized monitoring programs, common data management and to tackle MRL pollution prevention, management and remediation.

Given that in most sea regions, approximately 80% of marine litter is estimated to come from land, marine litter is part of the broader problem of waste management. Plastics are a key component of marine litter, and most plastics are used for packaging: thus, some of the complementary measures will invest on circular economy and plastic reduction in packaging and industrial transformative processes.

in February 2012 the Commission published a Communication on the bio-based economy for Europe, contributing to the Europe 2020 flagship initiatives "Innovation Union" and "A Resource Efficient Europe'. This communication encompasses, amongst others, the conversion of waste streams into value added products and it recognizes the need to provide to citizens more information about product properties and impacts of consumption patterns and life style in order to enable response and informed choices. Some bio-based products can be bio-degradable or highly bio-degradable (by micro-organisms) or compostable or highly compostable (under composting conditions). The accompanying Action Plan for Bio-based Products foresees actions ranging from improving the implementation of the present targets for bio-based products over standardisation, labelling and certification to ensure the quality and consumer information on the new products to harnessing the purchases of public authorities to set the example. Moving to a bio-based economy may hold the potential of creating less waste that ends up in the marine environment and may increase the use of products with less lasting impacts on our water ecosystems. A second strand of complementary actions will support bio-based solutions and crowdsourcing of citizens science applications that can reduce plastic and recover and reuse plastic waste.

The prime objective of the Integrated Maritime Policy (IMP) for the EU is to maximise the sustainable use of the oceans and seas while enabling growth of the maritime economy and coastal regions. Environment is a key component of the IMP. The European Commission commits, among other things, to take steps against discharges into the sea. A European network for maritime surveillance is one of the tools that can help to address such discharges and that the Commission will further develop jointly with the Member States. Other tools that the IMP refers to are Maritime Spatial Planning and Integrated Coastal Zone Management which can help through integrated planning to reduce the negative environmental impact of economic activities carried out in the marine and coastal areas. These activities include tourism, fishing and maritime transport, all sources of marine litter. A third strand of complementary actions related to the LIFE IP LIMESTONE will address tourism and other economic activities to incentive virtuous behaviour and enforce the adoption of solutions that will reduce MRL.

On 1 September 2010, the European Commission adopted a Decision (2010/477/EU) outlining the criteria to be used by Member States in the context of the MSFD to assess the environmental status of their seas. The two criteria and four indicators relating to marine litter are:

10.1 Characteristics of litter in the marine and coastal environment

- Trends in the amount of litter washed ashore and/or deposited on coastlines, including analysis of its composition, spatial distribution and, where possible, source (10.1.1)
- Trends in the amount of litter in the water column (including floating at the surface) and deposited on the sea-floor, including analysis of its composition, spatial distribution and, where possible, source (10.1.2)
- Trends in the amount, distribution and, where possible, composition of micro-particles (in particular micro-plastics) (10.1.3)

10.2 Impacts of litter on marine life

- Trends in the amount and composition of litter ingested by marine animals (e.g. stomach analysis) (10.2.1).

Complementary actions will support some drones and nanotech-based solutions that will help assess the environmental status of the rivers, of the lakes and of the coastal areas in the project areas.

2. Project objectives:

LIFE IP LIMESTONE will enhance the capacity in transnationally tackling environmental vulnerability, fragmentation, and the safeguarding of natural water ecosystems through an enforced institutional capacity building, a stronger and more effective stakeholders engagement and the deployment of easy-to-adopt innovative technological responses to prevent, manage and remediate marine litter.

IP itself

The specific objectives of the IP itself are:

SO1) **Enhanced institutionalized knowledge and competencies in the governance structures addressing Marine and Riverine Litter**: the IP will involve 1500 representatives from public authorities from 6 EU regions;

SO2) **Better regulatory framework to increase the capability to work at EU and multi-regional scale on MRL**: the IP will expand the experience of Marche Region and other EU best practices to implement a Marine Litter Strategy and related regional or national laws;

SO3) **Reduction of microplastic and plastic pollution in rivers and coastal areas by a more efficient use of human and technological resources**: according to the DPSIR conceptual model, drivers (hotspots of MRL generation), pressures (hotspots for MRL accumulation), ex-ante and ex-post status of microplastic and plastic pollution in adopting biotech and nanotech solutions at wider scale will be mapped and managed accordingly;
SO4) **Better citizens awareness and participation in plastic pollution prevention**: awareness and education actions will be put in place in all the project areas

SO5) **Creation of a multi-regional governance platform to support innovative approaches and institutional cooperation**: common improvements of legal and procedural aspects supporting MRL prevention, management and remediation will be addressed by LIFE IP LIMESTONE, as well as key points for institutional cooperation.

Complementary actions

The project will create synergies, by clustering complementary actions referred to 8 different objectives:

CA1: Implementation of joint research and evaluation activities on the types of MRL and their prevention possibilities;
CA2: Upgrading of infrastructures and equipment for mapping, diagnosing and managing MRL
CA3: Creation and support of collection and recycling companies
CA4: Re-scale and Update of skills for professionals involved in MRL prevention, management and restoration
CA5: Create smart bins for waste collection in critical and sensate areas
CA6: Contribute to the development of circular economy options based on MRL prevention
CA7: Potentiate river ecosystem and hydrogeological services
CA8: Strengthen landscape and tourism attractiveness of interested river basins and coastal areas

3. Actions and means involved:

The overall project workplan is represented in the following list of activities

Actions financed by LIFE:

A. Preparatory actions, elaboration of management plans and/or action plans

A1. Innovation Atlas and Review of existing and planned technologies and processes to be implemented in the IP (m 1-3)
A2. Data Collection and modelling for database integration as required for the project implementation (M 1-3)
A3. Initial stakeholder consultations (M 1-6)
A4. Setting up the interactive LIMESTONE monitoring system (M 1-6)
A5. Review and detailing of coastal zone/river basin plans to be turned in action (M3-8)
A6. Marine and Riverine Litter Management – Policy Report and Regulatory Tools to improve legal and procedural aspects (M8)

C. Concrete actions
C1. Smart sensing and drones-supported litter catching and detecting system
C2. Algae and nanotech-sponge water restoration areas and plants
C3. Plastic and microplastic waste prevention strategy: implementing actions to prevent pollution from land based sources
C4. Assessment of solid waste management systems and incentive schemes to support the introduction of biodegradable materials
C5. LIMESTONE Fellowship Programme
C6. LIMESTONE Government Academy and Capacity Building Strategy
C7. Citizens as MRL Patrols Strategy
C8. Innovation marketplace and hub to sustain a disruptive MRL reduction strategy

D. Monitoring of the impact of the project actions
D1. Monitoring of Capacity Building impact
D2. Innovative models to make RIA for MRL management, prevention and restore
D3. On-real-time indicators and transparency dashboard
D4. Monitoring of the project's contribution to the implementation of the targeted plans
D5. Financial and Funding Leverage Effect Assessment Scheme
D6. Monitoring of the project's environmental impact
D7. Monitoring of the project's socio-economic impact

E. Public awareness and dissemination of results
E1. Introduction of talking bins for waste collection
E2. MRL prevention and education actions
E3. Involvement of waste collection companies for MRL control
E4. Communication and Media Plan
E5. Participatory Labs for Schools
E6. Innovation Game for Universities, Business Incubators and Start-ups
E7. Investors Forum

F. Project management
F1. Project coordination and reporting
F2. Staff training and workshop
F3. Quality assurance and data management

Expected complementary actions

CA1 Research and applied innovation support schemes funded by ERDF and EARDF

CA2 Infrastructure upgrading and IoT-based investments in MRL management equipment

CA3 Support to MRL related circular economy solutions based on recycling and reuse of MRL

CA4 MOOC, Qualification and Training Schemes for Professionals, Young Researchers, NEETS and Civil Servants

CA5 Waste collection and detection equipped areas in selected ecological hotspots

CA6 Support to circular economy solutions related to MRL prevention, by using ESF, ERDF and EIB funds

CA7 Sustain the ecosystem functions of rivers and coastal zones, as relevant.

CA8 Support eco and plastic free tourism and alternative productions

4. Expected results (main outputs and achievements, qualitative and quantitative):

Linked to Actions financed by LIFE:

Define and implement appropriate instruments and incentives to reduce the use of plastic and microplastic, including the illustration of the associated costs and environmental impacts (e.g. establishment of levies, deposit fees, taxes or bans on plastic bags)

- Improve cooperation with the River and River Basin Commissions, as appropriate, in order to include impacts of litter on the marine environment from riverine inputs, taking into account activities in the context of the implementation of the Water Framework Directive (WFD) and the Bathing Water Directive
- Establish an exchange platform for spreading experiences on good cleaning practices in beaches and riverbanks, including cleaning beaches actions by local communities, riverbanks, pelagic and surface sea areas, ports, marinas and inland waterways, in cooperation with relevant fora
- Develop best practice on environmental friendly technologies and methods for cleaning fresh and sea water from plastic and microplastic pollutants

Linked to expected complementary actions

- Direct and indirect employment growth and innovative SMEs creation and upscale
- Raising the profile of the involved regions, even in terms of tourism attractiveness
- Upgraded skills among professionals and public administrations
- Optimisation of waste management plans and of the ratio of usage of landfills and waste recycling plant
- Support to the circular economy and the related actions within the Regional Smart Specialisation Strategies
- Better connection among business and research and support to the wider market penetration of bio-base and innovative solutions for MRL prevention, management and restoration

5. Expected contribution to the implementation of the target plan/strategy

IP itself

- Finalize, by mid-2020, common indicators and associated definition of Good Environmental Status (GES) related to marine litter for regional application in the years to follow;
- Identify, by end of 2020 the way forward to establish coordinated monitoring programmes for the common marine litter indicators including data collection for regular assessment of the state of marine litter in the 6 selected areas;
- Report on the implementation of actions for the first time in by 2021 through and advanced system of smart-sensors and simplified crowd-metering and on the effectiveness of the implemented actions and achievement of corresponding targets
- Engage in a dialogue and enhanced cooperation with the business and industry, river and sea users, local communities and other relevant civil society groups as well as national stakeholders focusing on marine litter, at the appropriate level, to promote the removal of litter from the marine environment in a practical, feasible and environmentally sound manner, to develop best available techniques (BAT) and best environmental practice (BEP), including identification of circumstances of "escapes" of litter into the marine environment as well as new waste management and adaptation practices to achieve a good environmental status.

Complementary actions

- Prepare and agree on guidelines on marine litter references to be included in national and local waste prevention and waste management plans, i.a. an element highlighting the impacts of marine litter.
- Analyze possible planning and investment (even to support MRL-related startups) by using the LIFE IP LIMESTONE methodology
- Establish an overview of the importance of the different sources of primary and secondary microplastics.
- Evaluate products and processes that include both primary and secondary micro plastics, such as fibres from clothing, assess if they are covered or not by legislation, and act, if appropriate, to influence the legal framework, or identify other necessary measures.

6. Main stakeholders involved in the project:

The main stakeholders to involve in the project have been identified by applying a prototype of the Stakeholder Circle (SC). The SC comprises two key elements: concentric circles that indicate distance of stakeholders from

the project manager. The patterns used for each stakeholder indicate their homogeneity. For example, a solid shade indicates an individual stakeholder, while shading or colour-fading can indicate a group. The size of the wedge and its relative area indicate the stakeholder's scale and scope of influence; the radial depth can indicate the degree of the stakeholder's impact or power to kill the project. The Stakeholder Circle is based on the premise that a project can only exist with the informed consent of its stakeholder community (Weaver & Bourne, 2002), and that managing the relationships between the community and the project will increase a project team's chances for achieving a successful outcome. The stakeholder community consists of individuals and groups, each with a different potential to influence the project's outcome positively or negatively. The visualisation tool highlights the project's key stakeholders so as to understand which stakeholders the project team has determined are essential for project success.The process of identifying project stakeholders begins by using the categories upwards, downwards, inwards, outwards, and sidewards. This is followed by identifying mutuality (French & Granrose, 1995), as defined in terms of understanding what each stakeholder requires from the project as well as the significance of the stakeholder to the project. Asking these questions establishes the nature of the relationship between the project and the stakeholders and ensures that project managers understand both groups' needs.The assessment of each stakeholder based on ratings from the project team members of the stakeholder's perceived power, proximity and urgency, produces an 'index' for each stakeholder within the tool. An inbuilt 'sort' function in the software produces the list of prioritised stakeholders as assessed by the project team. This list with its associated data on each stakeholder supports the development of an engagement strategy; one that enables the project team to ensure that the expectations of key stakeholders are understood, acknowledged, and managed.

The use of the SC Methodology led to identify 10 main groups of stakeholders that will be involved in the LIFE IP LIMESTONE

1. **Environmental Associations**: Legambiente, Goletta Verde, Fondazione Cetacea, WWF, Rethink Plastic Alliance,
2. **Universities**: Università Parthenope, Università di Camerino, Università di Urbino, Università di Salerno
3. **Ministries**: MATTM (Italy); Ministry of Environment (Portugal)
4. **International Institutions**: UNEP, MEDPAN
5. **Schools**: 20 pilot schools
6. **Public administrations**: 18 pilot cities
7. **Business Associations**: Federalimentare, CIA, Confagricoltura
8. **River Management Authorities**: Autorità Distrettuale dell'Appennino Centrale, Autorità Distrettuale dell'Appennino Meridionale
9. **Natural Parks and Marine Protected Areas**: Parco Nazionale del Cilento, Parco del Conero
10. **FLAGs**

In brackets the LIFE IP actions in which each type stakeholders will play a main role.

7. Long term sustainability (including capacity building):

The project will include the E component to coordinate the dissemination activities of the entire project, mainly focused on the publication of project results on relevant international journals and magazines, on the presentation at relevant conferences, workshops, symposia, and industrial events, and on the organization of specific scientific events.
Liaisons with other projects related with LIFE IP LIMESTONE will be established to increase the long term sustainability of the project. Capacity building will be supported through ESF initiative and also by promoting a pilot action in the framework of the National Operational Plan ESF 2014-2020.

Scaling up and replication, which are essential features for the success and exploitability of the strategy which is the pillar of the LIFE IP LIMESTONE, will be not only planned, but also tested during the project, In fact, the different scales of the pilots and the replication of the regional pilots from the 4 different Italian regions will provide significant feedbacks and point out possible scalability/replication issues, making it possible to address them within the project.
Scalability will be mainly affected by the scalability of the cloud infrastructure and by the effectiveness of gamification techniques and cooperation incentives developed. Replication will be mainly affected by the availability of a suitable dashboard to allow third parties to make use of the platform to address country-specific or community-specific needs.

In the E component an exploitation plan considering the needs, expectations, and possibilities of each partner and of the possible stakeholders will be prepared. The capability of providing fresh open data on MRL conditions and on producers/citizens/enterprises and policy makers habits grants to LIMESTONE great and diverse exploitation opportunities that can be taken both by the partners and be external stakeholders.
The exploitation plan will include:
- the exploitation of the open data, the reuse of which will be facilitated by the open APIs

- the replication and possible customization of the entire platform of bio-based and technological solutions for MRL pollution detection, management and restoration
- the possibility for a service company to develop advanced services on top of the platform

The exploitation plan will contain descriptions of how each individual partner envisages the exploitation of project results. This plan will be subsequently refined twice into updated versions containing also recommendations and guidelines. Thanks to the early publication of open data and to the deployment of large-scale pilots, the last two releases of the exploitation plan will also report on the preliminary exploitation of the early results.
A permanent governance network will support the integration of LIFE IP LIMESTONE sustainability within the post 2020 ESIF plans.

8. Expected major constraints and risks of the:

IP itself
For each of the initially identified Risks we have established: the Likelihood that the risk will occur, the Impact of the risk occurring, the Actions that will be implemented (e.g. prevention, reduction, acceptance or contingency) and the Impact of these Actions on the overall objectives. A summary list of the most significant Technical Risks and their contingencies are shown along with a risk rating.

MR1: Late/missing implementation of a dedicated regulatory scheme to support MRL reduction plans at regional level (prob.2; imp. 2; rank 4): this risk can turn into constraints for implementing the concrete actions of the project. The risk will be managed by investing in stakeholders awareness and engagement and in capacity building an extra effort, if needed.

MR2: Connected existing decision making tools don't take into account all requirements for effective MRL prevention, management and restoring (prob.2., imp.2. rank 4): this risk will result in the project delays due to the need of generating an alternative DSS. Connections and exchanges with EU best practices will help in facing such a risk in the most efficient wat.

MR3: MRL prevention awareness and education actions fail to reach the target number of stakeholders (prob.1, imp.3, rank 3): this risk will be managed by creating a reserve list of stakeholders, from which we can integrate or substitute the stakeholders which will drop off the project.

MR4: Delays in deliverable delivery (prob.2, imp.2, rank 4): All partners have experience and proven track records in large collaborative R&D and infrastructure projects. All are motivated to reach the project objectives and deadlines, which will be defined in the common interest of all partners. Any partner not adhering to this common interest will be excluded from the project.

MR5: Ineffective overall management (prob 1., imp 4, rank 4): Effective management is ensured through timely recruitment of a capable, expert and socially adept Project Manager (PM) with proven skills at managing large, complex projects. The PM will be given the resources and support needed to perform tasks effectively. Tasks of the PM and the coordinator will be delineated to ensure harmonious collaboration. In case of problems, the coordinator is a resolute problem solver.

Complementary actions
MR 6: Funding and financing resources are not promptly activated (prob.1, imp.4, rank 4); since the most part of funds are granted, this risk will be limited. In case of unexpected lack of funds, the dissemination and exploitation strategy will focus of potential private and alternative public funders to be activated.

MR 7: MS and Regional Authorities lack in coordination (prob. 1, imp. 4, rank 4): the strategy of LIFE IP LIMESTONE is based on EU Framework Directive and related National Plan and Guidelines. A Technical Assistance function in supporting coordination will be, in any case, activated also by linking LIFE IP LIMESTONE with other EU and international best practices and existing networks, that can supply additional inputs to enforce the coordination between Member States and Regional Authorities.

9. a) Is your project significantly climate related? **Yes** ■ **No** □

b) Is your project significantly biodiversity-related? **Yes** ■ **No** □

If you consider your project to be significantly climate or biodiversity-related (you marked 'yes'), please explain why:

Significance in climate relation

Though burning fossil fuels is the primary cause of global warming, fossil fuels could also be driving climate change via a completely different mechanism involving ocean plastic debris and tiny, bioluminescent fish living hundreds of meters beneath the ocean's surface. Lanternfish (aka myctophids) are only a few inches long typically but so ubiquitous that they account for over half the ocean's total fish-mass. They are vital to the ocean's ability to sequester more carbon than all the world's forests do on land through a daily mass migration that plays out in all seven seas.
By day, lanternfish avoid predators in deep, dimly lit waters, but they ascend nightly to the surface to gorge on carbon-rich plankton before descending back down where they deposit their carbon-rich poop. They also sequester carbon when eaten by larger fish.

Carbon sequestration by lanternfish is central to the overall role of marine environments in reducing human-caused CO2 emissions in the atmosphere – by an estimated 20-35 percent.Thus, anything harmful to lanternfish could hinder the ocean's capacity to act as a carbon sink. Alarming evidence that small bits of floating plastic debris resemble the plankton lanternfish feast on could spell trouble for them and, consequently, the climate.

Most plastics are still derived from petroleum and natural gas and, for practical purposes, are non-biodegradable, even though they fragment during weathering into progressively smaller pieces.Marine debris is composed primarily of plastics which accumulate in circulating ocean convergence zones called gyres. Since the groundbreaking discovery by the Algalita Marine Research Foundation in 1999 that plastic debris outweighed zooplankton in the surface waters of the N. Pacific gyre by a ratio of 6:1, there has been concern that small plastic fragments might be mistaken for food by plankivorous sea life.

A follow-up study revealed that more than a third of the stomachs of lanternfish captured at the ocean's surface in the N. Pacific gyre contained plastic fragments. Importantly, ingested plastics were similar in size (1-3 mm) and color (clear, white and blue) to the area's zooplankton.

Researchers at the Scripps Institute of Oceanography confirmed that lanternfish are consuming plastics and estimated that the weight of plastic debris consumed annually by fish in the in the N. Pacific gyre alone is 10s of tons.

Ingestion of plastic debris by lanternfish is thought to explain an otherwise head-scratching finding. Mass quantities of the plastics that are entering the ocean are disappearing, according to scientists who measured plastic debris in the surface waters of all five of the world's major gyres. Importantly, the missing plastic is largely debris 2-3 mm in size, matching the lanternfish's plankton diet.

Intestinal blockage, malnutrition and starvation are obvious potential dangers of consuming plastic debris, though chemicals associated with marine plastics might pose greater threats.

Oily toxic pollutants commonly found in seawater adsorb to the surface of plastics. Once ingested, the pollutants can transfer to the tissues of wildlife with potential for transfer up the food chain as smaller fish are eaten by larger ones.

Threat also stems from the basic building blocks of some polymers. Polycarbonate plastic, for example, is derived from BPA (bisphenol A), an estrogen mimic so harmful to the development of lab animals that use of polycarbonate plastics in baby bottles and sippy cups was banned in the United States in 2012.

The basic constituents of polyvinyl chloride (PVC) and polystyrene plastics are known or suspected carcinogens.

The myriad of additives which impart desired properties to plastic products add another layer of concern. Phthalate plasticizers and polybrominated flame retardants are common additives which interfere with hormonal systems in mammals, for example. Because additives are not bonded to the plastic polymer, they can leach out of ingested plastics into an organism's tissues.

A recent study documented contamination of lanternfish tissue with chemicals both manufactured into plastics and adsorbed from seawater.

Furthermore, the buoyancy of plastics might interfere with the lanternfish's ability to complete its migration from the surface back down to deeper waters, critical to sequestering carbon in the ocean's depth.

If lanternfish eating plastic debris represents a threat to climate stability, the situation is projected to only get worse. Half of all plastics that ever existed were produced in just the last 13 years, according to a first-ever accounting of all plastic created anywhere on Earth since 1950. Of the 6300 million metric tons of plastic waste ever generated through 2015, roughly one-fifth has been recycled or incinerated, leaving four-fifths amassed in landfills or in the natural environment.

If current trends prevail through 2050, landfills and the natural environment will have accumulated 12,000 million metric tons of plastic waste.In another first-ever study, researchers estimated how much plastic waste is entering the ocean yearly from the mismanaged discards of people in coastal countries worldwide – between 4.8 and 12.7 million metric tons or 1-5 percent of plastics generated.

Depending on buoyancy, some plastics float while others sink to the bottom or distribute throughout the water column. Given the ocean's expanse and the rate that new plastics are entering, open ocean cleanup schemes are not a feasible solution. This requires integrated River/Coastal/open Sea solutions supported by new technologies, and a totally different approach to plastic waste prevention as the ones that will be explored and implemented in the LIFE IP LIMESTONE.

Significance for biodiversity

According to the GESAMP (2015). "Sources, fate and effects of microplastics in the marine environment: a global assessment", impacts of microplastic and, more generally, marine and riverine debris are significant for the water microbiota and species.

Globally more than 200 species are known to be affected by marine rubbish including whales, seals, dugong, seabirds, turtles, crabs, seasnakes, sharks, rays and other fish.
Seals, turtles, sharks and dolphins are killed by abandoned fishing nets. tedxgp/Flickr

Pollution from human activities has major impact on the world's marine ecosystems. Plastic refuse is one of the most pervasive types of pollution.

More than 80 million tons of plastics are estimated to be produced globally each year. These plastics are durable, requiring about 500 years to decompose in the ocean. Their durability and buoyancy allows them to be carried far from their sources.
Plastic gets into the ocean, into marine species and into us

For instance, the ratio of plastic to zooplankton in the major ocean gyres, which tend to concentrate floating material, is estimated to be up to 6:1 by weight.

Whales, fish and other marine species depend on zooplankton for food, as they are the fundamental link to the phytoplankton who the capture sun's energy. Researchers currently believe plastics are taken up by zooplankton, thus entering the food chain.

Plastics also bring toxins into the food chain. When plastics break down, they produce toxic products. They also aggregate pollutants in the environment. Both are released when animals digest the plastic.

Globally more than 200 species are known to be affected by marine rubbish including whales, seals, dugong, seabirds, turtles, crabs, seasnakes, sharks, rays and other fish.
When plastics break down, they produce toxic products. tedxgp/Flickr

While many of these species are threatened, still others form part of our diet. This means that plastic ingested by wildlife not only affect them - their guts may be perforated and they may starve - but toxins from the plastics may also be absorbed by humans.
Tangled up in blue

Entanglement is also a significant threat to marine species. For example, up to 40,000 fur seals are killed each year when they get tangled in debris. This contributes to a population decline of 4-6% per year.

Entanglement affects nearly all groups of marine vertebrates. We know that in Australian waters turtles, cetaceans, seals, sea lions, seabirds, sharks and rays, crabs and other animals are affected.

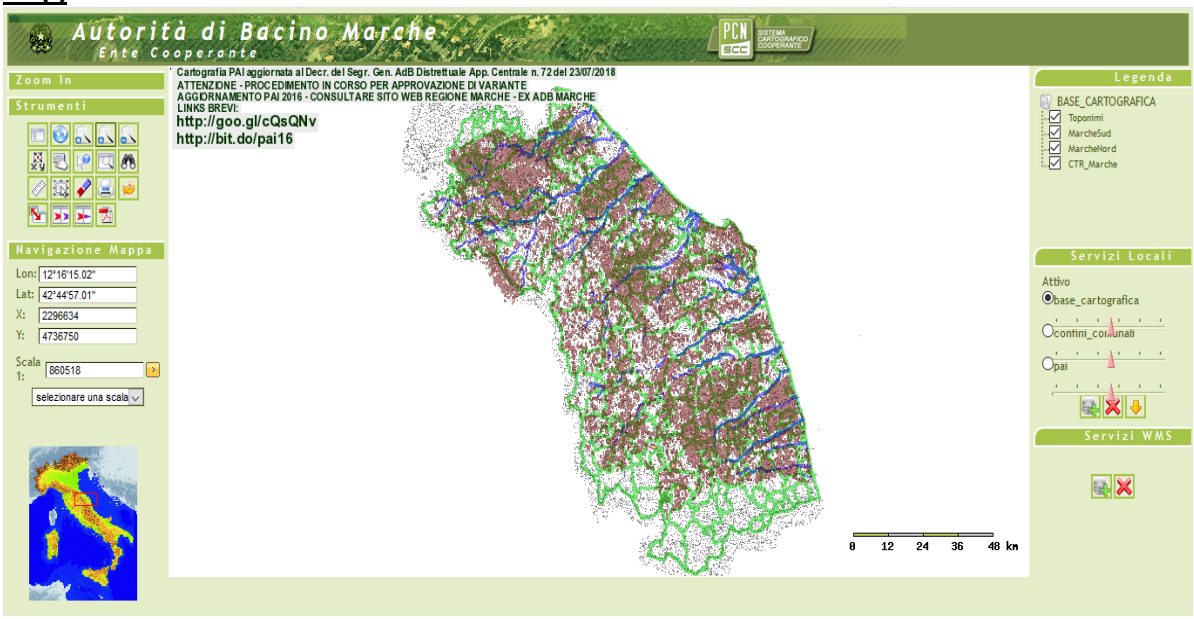
Lost fishing gear and related refuse in particular is a major issue. Globally it is estimated that at least 6.4 million tons of commercial fishing gear is lost into the ocean each year.

Recent oceanographic modelling suggests that these nets drift over large areas of the region, likely impacting six of the world’s seven marine turtle species which occur there. Many other species are probably also affected, but decay before the nets wash ashore and are found.

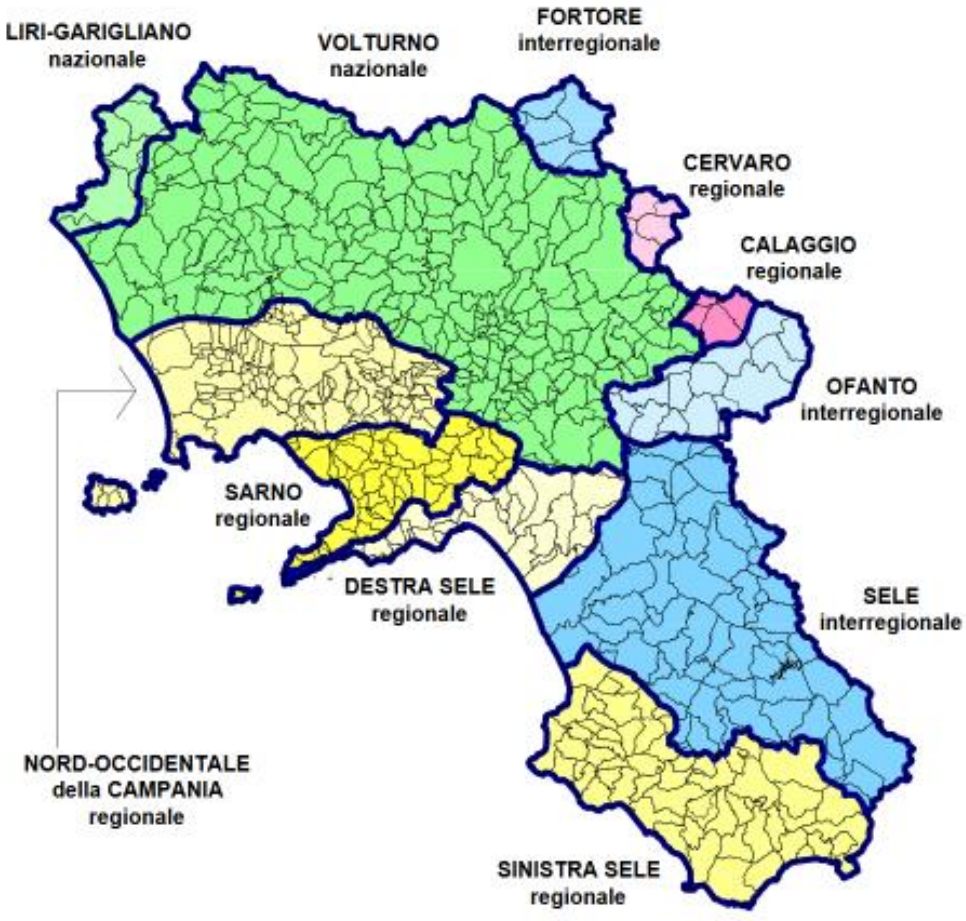
LIFE IP LIMESTONE will adopt membrane solutions and bio-sensors and bio-based fish feeding to restore damages made by plastic ingestion.

MAP OF THE GENERAL LOCATION OF THE PROJECT AREA(S) IN THE COUNTRY/REGION

Project areas in Marche Region (the river basins and the entire coastal zone as marked in the map)

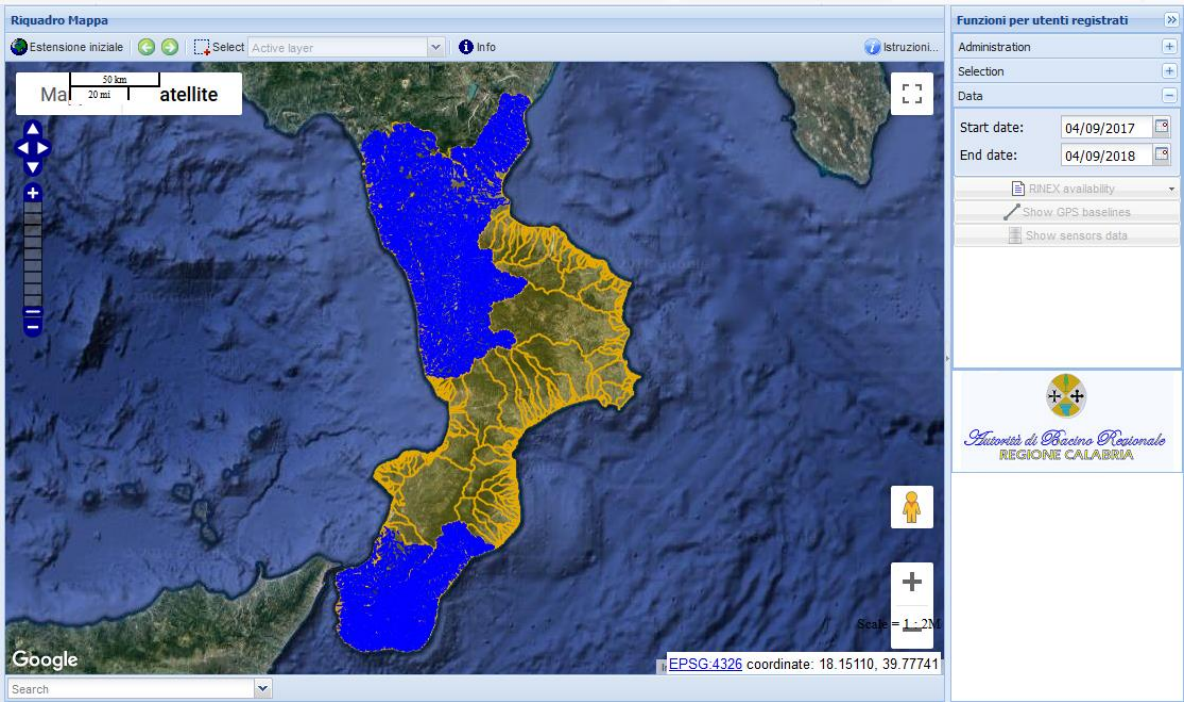


Project areas in Campania Region (the 11 areas addressed by the LIFE IP LIMESTONE)



fonte: http://burc.regione.campania.it

Project areas in Calabria Region (the dark blue marked areas)



Project areas in Puglia Region (the dark blue areas)

fonte: http://burc.regione.campania.it