



Sarg As & CLD

Environmental impacts of *Sargassum* leachates due to **Arsenic** and **Chlordecone**: quantification, mitigation and social perception

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Summary

- ▶ The consortium
- ▶ Aims / Objectives
- ▶ Management of the project
- ▶ Research questions addressed
- ▶ Expected Results
- ▶ Added value/dissemination/perspective for development

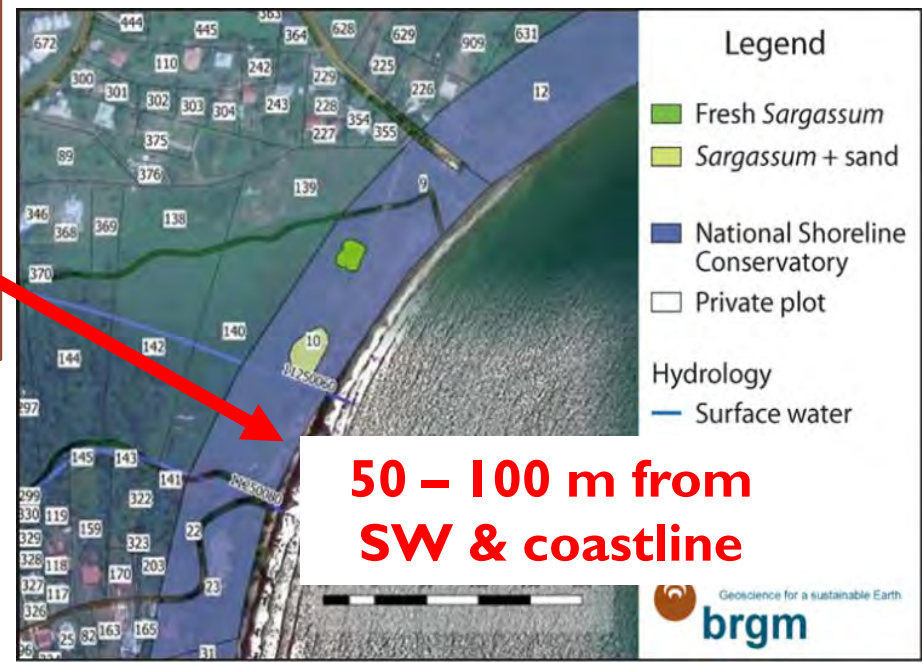
The consortium

- ▶ **Brgm**
 - ▶ Coordinator (FR, Orléans)
 - ▶ Field work (Brgm Guadeloupe)
 - ▶ Lab studies on As removal (Brgm Orléans)
 - ▶ As location in/on *Sargassum* (Brgm Orléans)
- ▶ **Univ. Antilles (Gdp, ecotoxicity)**
- ▶ **Univ. Guyane (HSS)**
- ▶ **IT2A (FR, Bordeaux: As speciation)**
- ▶ **Univ. Orléans / CNRS (FR; activated carbon)**
- ▶ **TAMUG, USA; ecotoxicity**
- ▶ **Stakeholders: Conservatoire du littoral (GDP) + Carbet des Sciences (MAR)**

Aims / Objectives



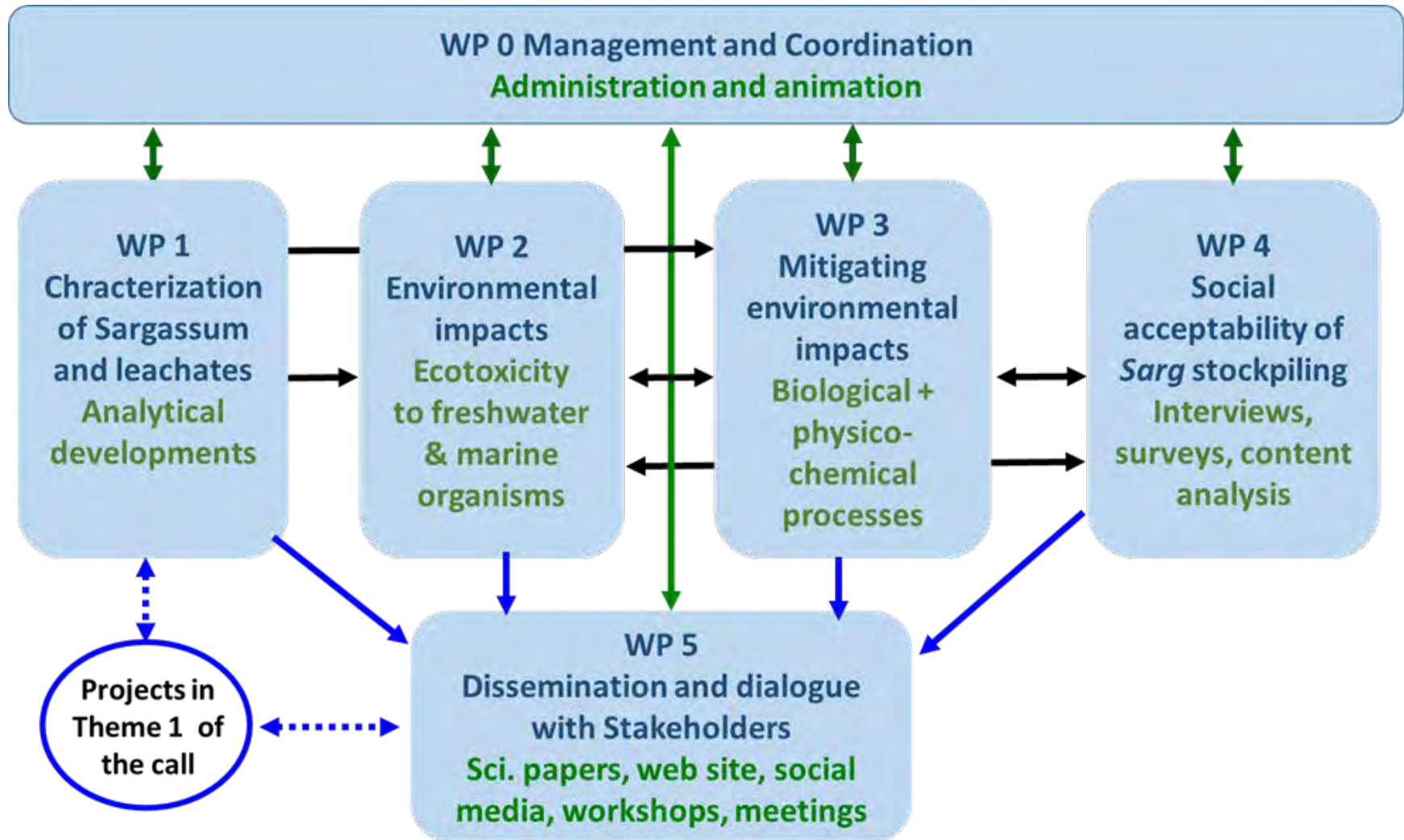
Sargassum « leachate »
Total As: up to 8 mg/L (n = 3)
+ Chlordecone



Aims / Objectives

- ▶ Improve knowledge on *Sargassum* contamination by As (marine origin) and chlordecone (CLD; terrestrial origin)
- ▶ Assess the ecotoxicity of *Sargassum* leachates, with a focus on As & CLD, to a range of representative test organisms,
- ▶ Develop durable remediation processes for As & CLD in leachates
- ▶ Assess the social acceptability of *Sargassum* stockpiling
- ▶ Dissemination of results and dialogue with stakeholders

Project management



Research questions addressed

- ▶ **As & CLD: how much, where, & under what form? WPI Characterization of *Sargassum* and their leachates**
 - ▶ Microscopy observations of *Sargassum* (BRGM)
 - ▶ Speciation (inorganic AND organic) and analysis of As in *Sargassum* and *Sargassum* leachates (ADERA-UT2A)
 - ▶ Analyses of chlordecone (Brgm + tender)
- ▶ **Environmental impacts ? WP2 Environmental impacts of *Sargassum* leachates**
 - ▶ *Macrobrachium rosenbergii* (crustacea) bioassay; lab + field (ecotox + body burden)
 - ▶ *Crassostrea rhizophorae* (oyster) bioassay; lab
 - ▶ *Danio rerio* (zebrafish) bioassay; lab

Research questions addressed

- ▶ **What can be done? WP3 Mitigation of leachates impacts**
 - ▶ Arsenic (Brgm); *μbiology-based process; lab + field*
 - ▶ Chlordecone (partner ICMN); *activated carbons + other means; lab*
- ▶ **How about the people? WP4 Social acceptability of Sargassum stockpiling**
 - ▶ *populations knowledge, perceptions and positions ; questionnaires using surveys*
 - ▶ *feelings of people living close to the stockpiling sites : NIMBY ? qualitative survey*
 - ▶ *inclinations of the French Caribbean population to come out in protest ; online, printed, audio-visual material + semi-structured interviews*

Added value + Dissemination and dialogue with stakeholders

▶ Added value

- ▶ See interdisciplinarity of consortium

▶ Dissemination

- ▶ European Union rules on dissemination by Open Access for the most important outputs
- ▶ Protection (patent) of results prior to any external communication; intellectual property rights (IPR) incorporated in the Consortium Agreement.
- ▶ peer-reviewed publications + scientific conferences.
- ▶ project website + social media + Flyers/Factsheets (Le Carbet des Sciences Martinique).
- ▶ to stakeholders: BRGM in various policy and decision-making bodies

Impact and engagement

- ▶ **For stakeholders and end-users**
 - ▶ shared assessments of the risks associated with Sarg stockpiles.
 - ▶ For public policy-making, : hard facts to be used in developing possible regulations
- ▶ **The economic impact**
 - ▶ optimization of the compromise between the cost-effective management of the stockpiled algae and the environmental impacts of Sarg leachates
 - ▶ private partner: extension of the range of marketable analyses and deepening of partnerships

Impact and engagement

- ▶ For the scientific community
 - ▶ the interdisciplinary of the project + the high level of expertise => results with strong impacts in analytical chemistry, ecotoxicity tests and remediation processes, all three rarely directly linked with each other, and human and social sciences.
- ▶ Link with ongoing initiatives,
 - ▶ Eco3Sar project (launched by ADEME) in its WP2 (Securing & valorization of storage), WP3 (Toxicokinetics of micropollutants) and WP5 (Provision of recommendations).

Acknowledgements

- ▶ ANR, ADEME, Région Guadeloupe, Collectivité territoriale de Guyane
- ▶ A. Mermet (Consulat de France, Texas)
- ▶ P. Louchouart (TAMUG)
- ▶ P. Ollivier (Brgm; finish line)
- ▶ Others...

Budget

Partner	Man-months	Personnel cost	External expenses	Overheads	Total cost	Funding requested
BRGM	35	155 000 €	70 000 €	89 385 €	314 385 €	157 191 €
ADERA/UT2A	14	86 955 €	30 800 €	61 285 €	179 040 €	80 568 €
ICMN	29	74 230 €	27 000 €	9 280 €	110 510 €	44 280 €
Univ. Antilles	20	76 200 €	63 800 €	5 680 €	145 680 €	76 680 €
Univ. Guyane	27	91 800 €	22 600 €	4 688 €	119 088 €	36 288 €
<i>TOTAL</i>	125	484 185 €	214 200 €	170 318 €	868 703 €	395 007 €