LITTORAL 2016
BIARRITZ 25-29 October

THE CHANGING LITTORAL, ANTICIPATION AND ADAPTATION TO CLIMATE CHANGE


REPORT

LITTORAL 2016 was funded by the EUROPEAN UNION with ERDF, the Nouvelle Aquitaine Region, the French Ministry of Environment energy and sea, the Department of Pyrénées-Atlantiques, the City of Biarritz, the Agglomeration of Côte Basque-Adour, the Agglomeration of Sud-Pays Basque and the Lloyd's France

All of them are greatly acknowledged

The Bellevue Congress Center (photos B. Papion and Y. Battiau-Queney)
This short report was written by Yvonne Battiau-Queney
It will be completed by the proceedings of the conference Littoral 2016
based on the audio-recording of plenary events in the auditorium

Abstracts of oral papers and posters, slide shows and video presentations of keynotes and workshops will be available on line: www.euccfrance.fr or http://littoral2016.univ-pau.fr

In case or remark or comment, please contact euccfrance@centredelamer.fr

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The organizing team:

**EUCC-France**
- Bérengère Clavé-Papion
- Yvonne Battiau-Queney
- Vincent Bawedin
- Sandrine Aubié

**Centre de la mer de Biarritz**
- Emilie Milon
- Iker Castège

**Université de Pau et des Pays de l'Adour**
- Stéphane Abadie
- Philippe Maron
VENUE: BELLEVUE CONGRESS CENTER IN BIARRITZ

The Bellevue congress center is located in the city center close to the "Grande Plage" of Biarritz.

AIM AND CONTEXT OF LITTORAL 2016

Littoral 2016 "The changing littoral. Anticipation and adaptation to climate change" has been organized by EUCC-France in close co-operation with the "Centre de la mer" of Biarritz and the University of "Pau et des Pays de l'Adour". It was the 13th event of the biennial international "Littoral conferences" of the European NGO Coastal & marine Union (EUCC).

Littoral 2016 in Biarritz had a dual purpose:

- It was a scientific conference with researchers and experts coming from all parts of Europe and allowing to take stock of the scientific knowledge, new tools and methods of study of coastal zones. Finally 6 keynotes, 88 oral papers and 28 posters could be presented during the 3 days of the conference. The topics concerned the shoreline mobility, storm effects, sea-land interactions, and biodiversity response in a context of climate change and increasing human pressure in coastal areas. The necessary adaptation and anticipation of coastal management to global change and the way to manage coastal risks were central to the conference. Nothing can be done properly without a good knowledge of natural processes and taking into account the socio-economical and political context as well.

- It was also a noteworthy event to help the national, regional and local stakeholders and policy makers to show their "savoir-faire" and how they contribute to the current discussion on the best practices and strategies of coastal management. It is more and more evident that we have to adapt to climate changes, peculiarly to the sea-level rise. Managers and policy makers have to prevent and manage coastal risks and adapt their strategy to increasing vulnerability of coastal areas since they attract more and more people.

In organizing Littoral 2016, EUCC-France and its partners have clearly contributed to the definition of a strategy of coastal zone management on national, regional and local scales. It explains that the conference was supported by the French ministry of environment, energy and sea, as well by regional and local authorities. Moreover the international dimension of Littoral 2016 offered good opportunities to compare French and other European experiences and practices.

Because of its dual purpose Littoral 2016 brought together scientists, engineers, managers, policy makers, according to the traditional mission of EUCC-France: bridge the gap between researchers and scientists on one side and on the other side all those who make nowadays decisions which will shape the future littoral.

Besides our funding partners (mentioned on the front page), we thank also the Coastal & Marine (EUCC) network and all our scientific and institutional partners in France and Europe for their involvement and support to make a success of this international conference. We especially thank the Centre de la Mer of Biarritz which presently hosts EUCC-France. At last it is a pleasure to gratefully thank the 16 French, German and Lithuanian students who cheerfully and skilfully helped the participants all along the conference.
INVITED PERSONALITIES

The conference was opened by Michel Veunac, the mayor of Biarritz, councilor of the "Nouvelle Aquitaine" Region who presented the cross of "Chevalier de la Légion d'Honneur" to Yvonne Battiau-Queney, president of EUCC-France.

The opening ceremony went on with the speeches of
Sandrine Derville, vice-president of the "Nouvelle Aquitaine Region", representing the president Alain Rousset;
Kotte Ecenarro, mayor of Hendaye, councilor of the Department of "Pyrénées Atlantiques";
Albert Larousset, mayor of Guéthary;
Renaud Lagrange, president of the GIP Littoral aquitain, vice-president of the Nouvelle Aquitaine Region
Jean-François Rapin, president of ANEL, senator of the Pas-de-Calais Department, councilor of the "Hauts-de-France" Region;
Gerald Schernewski, president of the Coastal & Marine Union (EUCC).

Other personalities were present:
Guy Lengagne, former French Minister, chairman and managing director of Nausicaa (Boulogne-sur-mer)
Guy-Antoine de La Rochefoucauld, Country Manager of Lloyd's France SAS
Several delegates of the Ministry of environment, energy and sea and devolved state services.

Invited personalities who could not be present and asked to be excused:
Ségolène Royal, Minister of environment, energy and sea;
Alain Rousset, president of the "Nouvelle Aquitaine Region";
Jean-Jacques Lasserre, president of the Department of "Pyrénées Atlantiques";
Claude Olive, president of the Agglomeration of "Côte Basque-Adour", mayor of Anglet;
Peyuco Duhart, president of the "Agglomeration of Sud-Pays Basque", mayor of St Jean-de-Luz;
Emmanuel Alzuri, mayor of Bidart;
François Mitteault, Director of water and biodiversity at the ministry of environment, energy and sea;
Pierre Dartout, regional prefect of the "Nouvelle Aquitaine Region", prefect of Gironde;
Eric Morvan, prefect of "Pyrénées Atlantiques".

From left to right and top to bottom:
- Front of the Bellevue center
- Auditorium
- Rotonde (gala dinner)
- A part of the hall with coffee-break and posters

(photos: I. Castège, T. Van Heuvel, E. Milon)
Littoral 2016 included 3 days of indoor conference (25-27 October), with 6 keynotes, 14 scientific "ordinary" sessions and 6 specialized workshops/round-tables. Then 2 regional field trips (28 and 29 October) offered good opportunities to make known the beauty and diversity of Aquitaine and Basque coasts and present some regional researches. English was the official language but keynotes and most workshops were simultaneously translated into French (or English in case of French speech).

KEYNOTE SPEAKERS (PLENARY LECTURES)

Gerald Schernewski, Prof. Dr. habil., head of the group Coastal Research & Management at the Leibniz-Institute for Baltic Sea Research in Warnemünde (Germany).
"Integrated coastal zone management. State and perspectives"

Per Sørensen, Danish Coastal Authority, Head of Coastal Research (Denmark).
"Challenges in the coastal area in Denmark in today and future climate"

Nicolas Castay, director of the “Groupement d’intérêt public” (GIP) Aquitaine Littoral, France.
"Current experimentation of integrated coastal zone management on a regional scale: the case of the Aquitaine coast"

Jochen Hinkel, Senior researcher at the Global Climate Forum (GCF) in Berlin, lecturer at the Division of Resource Economics at Humboldt University (Germany).
"Can we adapt to sea-level rise?"

Andrew Cooper, Professor of Coastal Studies at Ulster University in Northern Ireland.
"Possible consequences of sea-level rise for the shoreline mobility on different time scales"

François Schmitt, Research Professor, director of the Laboratory of Oceanology and Geosciences (CNRS, University of Lille and University of Opal Coast Littoral), France.
"Multiscale analysis of water level time series (modeled and measured) and the dynamics of return times"

See detailed CV, abstracts and PowerPoint presentations on line (http://littoral2016.univ-pau.fr)

SCIENTIFIC SESSIONS

128 abstracts were submitted to the scientific committee (62 experts from 16 different European countries). 88 oral papers and 28 posters could be presented in 14 oral sessions and 2 poster sessions. For logical reasons some oral communications have been inserted in special sessions and thematic workshops.

Papers and posters concerned three main themes:
- Knowledge on Coastal environment: state of the art, new tools and approaches in the context of climate change
- Governance: coastal environment protection, integrated coastal zone management (ICZM) and adaptation to climate change
- Sustainable development and technical approaches in the coastal zone and adaptation to climate change ("Blue Growth")

Titles and authors of papers and posters can be seen on the detailed program (on the website http://littoral2016.univ-pau.fr). The book of abstracts (keynotes, oral papers, posters) was given to all participants.

WORKSHOPS AND SPECIAL THEMATIC SESSIONS
• **Strategic choices of coastal management on different scales (from European to local scale)**
  Coordinators: GIP Aquitaine Littoral, Nouvelle Aquitaine Region, Department of "Pyrénées Atlantiques", "Agglomération Côte Basque Adour", "Agglomération Sud Pays Basque", GIS Littoral basque

  A rich discussion with the audience was preceded by several talks
  - Pascale GOT, deputy of the Gironde Department: "Coastal management in relation with climate changes: a law proposal"
  - Arnaud GUEGUEN, GIP Aquitaine Littoral: "From a regional scheme to the implementation of local strategies for the management of coastal risks in Aquitaine"
  - Caroline SARRADE, Agglomération Côte basque Adour
  - Caroline HUVETEAU, Agglomération Sud Pays Basque
  - Caroline LUMMERT, GIS Littoral basque
  - Gaëlle FROSTIN, CESER "Atlantique": "Society's perceptions of coastal management along the Atlantic coast"

• **Thematic session and workshop on dune geomorphology, biodiversity and management in relationship with climate change**
  Coordinators: Marie-Hélène RUZ, Professor at the University of Littoral-Opal Coast and Albert SALMAN, Coastal & Marine/EUCC, the Netherlands
  Several papers (followed by discussion with the audience) were read by
  - Corinne CORBAU, University of Ferrera, Italy: "Natural processes and human influences on the long and short term evolution of the littoral of Rosoina, Northern Adriatic (Italy)"
  - Annelore BEZZI, University of Trieste, Italy: "Inventory and conservation assessment for the management of coastal dunes, Veneto Coasts, Italy"
  - Carla GARCIA-LOZANO, University of Girona, Spain: "Current status and future prospects of coastal dune systems of Catalan Shore (Spain, NW Mediterranean Sea)"
  - Marie-Hélène RUZ, University of Littoral-Opal coast, France: "Distinctive incipient foredune development along a prograding macrotidal shoreline, Northern France"
  - Sam PROVOOST, Research Institute for Nature and Forest, Belgium: "The future of marram dunes in a changing climate"
  - Frederik ZWART, Staatsbosbeheer, Frisian Wadden Islands, The Netherlands: "Soft solutions: solid as a rock?"

• **Coastal hazards and governance. Problems of responsibility and insurance in the strategies of integrated coastal management on European and national scales.**
  Coordinator: Fanny PUPPINCK (EUCC-France)
  Five oral papers were read by the following personalities and aroused a very informative discussion with the audience:
  - Guy LENGAGNE: Former Minister of the French Government, initiator of the French Littoral Law
  - Philippe LESAGE, National representative of the SMACL (Société mutuelle d'assurance des collectivités locales)
  - Laurent MONTADOR: Deputy General Manager of the CCR (Caisse Centrale de Réassurance).
  - Guy-Antoine de LA ROCHEFOUCAULD: Country Manager of Lloyd’s France
  - Jochen HINKEL, Senior researcher at the Global Climate Forum (GCF) in Berlin, lecturer at the Division of Resource Economics at Humboldt University (Germany)

  The PowerPoint presentations are available on both sites: [http://littoral2016.univ-pau.fr](http://littoral2016.univ-pau.fr) and [www.euccfrance.fr](http://www.euccfrance.fr)
Preventing to Adapt with Young Professionals
Coordinators: Robbert MISDORP, YPCC Programme Coordinator, and Albert SALMAN, Coastal & Marine /EUCC (scheduled on Wednesday afternoon 26 October).

With the participation of:
- Stephane ABADIE, Professor, University of "Pau et Pays de l'Adour", France
- Leo BENTVELZEN & Ruben de VRIES, University of Applied Sciences, Leeuwarden, The Netherlands
- Ted van de KLAWU, University of Applied Sciences, Delft, The Netherlands
- Andre DIJKSTRA, Royal Netherlands Institute for Sea Research, Texel, The Netherlands
- Tjark van HEUVEL, Advisor, EUCC Leiden, The Netherlands

Nature, impacts and uncertainties of climate change in coastal areas
Coordinator: Eric BRUN, Ministry of Environment - DGEC/SCEE/ONERC (National Observatory on warming climate effects)
With the participation of:
- William LLOVEL (CERFACS, Toulouse): sea-level rise in the past; observations and causes
- Gaël DURAND (Laboratoire de Glaciologie et Géophysique de l’Environnement, Grenoble): sea-level rise in the future. IPCC projections, risks and uncertainties linked with polar icecaps and ice shelves (Greenland and Antarctic)
- Jean-Pierre GATTUSO (Oceanological observatory of Villefranche-sur-Mer): ocean acidification; state of knowledge, projections and possible impacts
- Martin BENISTON (University of Geneva): Storms and cyclones; recent development and projections on regional scale

The PowerPoint presentations are available on both sites: [http://littoral2016.univ-pau.fr](http://littoral2016.univ-pau.fr) and [www.euccfrance.fr](http://www.euccfrance.fr)

Climate change and extreme events: few examples from Aquitaine coastal research (workshop and thematic session)
Coordinators: Iker CASTEGE, director of the "Centre de la Mer de Biarritz" (ERMMA programme), Stéphane ABADIE, Professor at the University UPPA (“Université de Pau et des Pays de l’Adour”), Cyril MALLE, BRGM

The oral papers focused on winter 2013-2014
I. DE SANTIAGO, D. MORICHON, S. ABADIE, P. ARNOULD: "The role of coastal structures during the winter 2013/2014: Anglet, France"
F. ARNOUX, S. ABADIE, I. KOJADINOVIC, P. MARON: "2013-2014: Statistical characterization of a highly damaging winter"
X. BERTIN: "Winter 2013-2014: Impacts on the Pertuis Charentais coastlines"
B. CASTELLE: "Winter 2013-2014: Impacts on the sandy coast of Gironde"
E. MILON, I. CASTÈGE: "Marine biodiversity and climate changes. Some examples from ERMMA program in the Bay of Biscay"
N. SUSPERRÉGUI, F. D’AMICO, T. PIGOT, Y. DEL AMO, N. BRU: "Hydroclimatic mucilage Index (HMI) in the Bay of Biscay: historical change and relation to regional and global climatic index"
G. DELETRAZ, A. POTTIER, T. TRAN: "The difficult construction of a trust relationship between professional, scientific fishermen and managers vis-à-vis an unknown phenomenon"

FIELD TRIPS

- The first post-conference one day field trip (28th October) lead 55 participants along the coast of the Basque country, from Biarritz to San Sebastián. It was prepared and organized by Cyril Mallet and Christophe Garnier (BRGM) with the help of Alistair Brockbank (CPIE Littoral basque) who kindly
accepted to translate in English the French talks. Geomorphology, biodiversity and landscape diversity, coastal hazards, management strategies were the main topics. Among the strong points of this field trip, we can emphasize the stop close to the Biarritz lighthouse, the panorama over the “Côte des Basques”, the visit of Guéthary coastline (with Albert Larrousset, Mayor of Guéthary), the visit of the Abbadia estate (which belongs to the Conservatoire du Littoral and where the participants could picnic and visit the farm museum of Asporotssttipi), the stop in San Sebastián and the visit of Saint Jean de Luz with Christian Ondicola (association Itsas Begia) who explained the maritime history of this city since the 14th century. Saint Jean de Luz has also a rich and well preserved building heritage and the city is famous to have welcomed king Louis XIV when he married the Spanish infante Marie-Thérèse.

- The second post-conference one day field trip (29th October) lead 40 participants along the Aquitaine coastal dune fields, from Biarritz to Arcachon Basin and the Pilat dune (the highest European dune). It was lead by Loïc Gouguet (ONF) and Marie-Claire Prat (University of Bordeaux). The dune geomorphology, biodiversity and historical development, as well as the dune management since the beginning of the 19th century were the main topics. The trip started from Biarritz with a cool foggy weather but it changed rapidly and every participant could enjoy a sunny summerlike day. One strong moment was the ascent of the Pilat dune. All along the day, the landscape beauty and richness of the talks (given by some of the best experts and scientists, as Loïc Gouguet, David Roseberry, Emilie Sautret, Marie-Claire Prat, Jean-Pierre Tastet, Marie De Vos) have made a great success of this field trip.

For both field trips a guide-book was given to the participants.

SIDE-EVENTS

- All participants were invited to visit the Sea-Museum of Biarritz on Tuesday evening (25th October). The aquarium was recently renovated and enlarged (7 000 m²). It is the largest aquarium showing species and marine biodiversity of the Biscay Bay. The seal terrace was visited just at sunset.

A few pictures of the Sea Museum (from Tjark Van Heuvel and Y. Battiau-Queney)

- The Conference gala dinner (Thursday 27th) took place in the Rotonde room of the Bellevue Center. 114 participants (half of them coming from foreign countries) greatly appreciated local and regional specialties and Bordeaux wine. They also warmly welcomed and applauded a group of Basque singers (Amicale du Petit Bayonne)

The gala dinner: photos Vincent Bawedin and Tjark Van Heuvel)
AUDIENCE

Littoral 2016 in Biarritz brought together 250 persons. Among them one hundred were coming from 15 different countries. Elected representatives, managers, engineers and technicians could discuss and exchange experiences with French and foreign scientists. Most of the French laboratories working on coastal areas on all subjects were represented. Great foreign universities and research centers were represented as well (Germany, Baltic States, Denmark, Sweden, Norway, United Kingdom, Ireland, The Netherlands, Italy, Portugal, Spain, Switzerland...).

During the three days, the meeting organization was efficiently helped by a team of 16 students coming from Germany (University of Warnemünde), Lithuania (University of Klaipeda), France (Universities of Pau-Pays de l'Adour and La Rochelle). They made a very good job while supervised by Bérengère Papion (EUCC-France) and Emilie Milon (Centre de la Mer de Biarritz). All of them are greatly acknowledged.

Lunches took place in the beautiful "Atlantique" room which overlooks the "Grande Plage" of Biarritz

EXHIBITION

In the great hall of the Bellevue center several exhibition stands were presenting activities of the BRGM (French Geological Survey), Observatory of the Aquitaine Coast, Suez Environnement (Protech) and EBS Technology.

LITTORAL 2016 PUBLICATIONS AND COMMUNICATION

The abstracts of oral papers and posters, PowerPoint presentations and videos of keynotes and workshops will be available on line (www.euccfrance.fr & http://littoral2016.univ-pau.fr) with the agreement of their authors.

Two special issues will be devoted to Littoral 2016 scientific contributions in the Journal of Coastal Conservation and in "Géomorphologie. Processus, relief, environnement". Authors of oral papers and posters have been invited to submit papers.

Both field trips were illustrated by guide-books (in French and English) which were given to the participants. Extra copies could be printed on demand (contact the Centre de la Mer de Biarritz for financial conditions).

The proceedings of Littoral 2016 are in preparation and will be ready very soon. They are based on the audio-recording of plenary events in the auditorium.

EUCC-France Réseau Européen des Littoraux contact: euccfrance@centredelamer.fr
ORGANIZERS OF LITTORAL 2016

- EUCC-France
- The "Centre de la Mer" of Biarritz
- The "Université de Pau et des Pays de l'Adour"

OTHER PARTNERSHIP FOR LITTORAL 2016

- French institutions members of EUCC-France:
  - ONF (Office National des Forêts)
  - BRGM (French Geological Survey)
  - CONSERVATOIRE DU LITTORAL
  - CEREMA
  - ANEL (French national association of elected representatives of coastal cities)
  - EID-Méditerranée

- GIP Littoral Aquitain
- CPIE Littoral Basque
- The Coastal & Marine Union (EUCC)
SCIENTIFIC PARTNERS OF LITTORAL 2016

University of Pau-Pays de l’Adour (Federation MIRA)
Centre de la Mer of Biarritz
Laboratory of Oceanology and Geosciences UMR 8187 LOG CNRS/Lille /ULCO
UMR LIENSs 7266- University of La Rochelle/CNRS
University of West Brittany - LETG Brest- Géomer- UMR 6554 CNRS
The Observatory of the Aquitaine Coast (OCA)
University of Bordeaux - CNRS EPOC UMR 5805 and Lab. of Applied Physical Geography
University of Caen Normandy
Groupement d’Intérêt Scientifique (GIS) Littoral Basque
Réseau de Recherches Littoral Aquitain (RRLA)
AZTI-Tecnalia
A few pictures of the field trip along the Basque coast (28th October)

(note that maps, sketches and many other photos illustrate the guide book)

Guéthary (photos Emilie Milon, Tjark Van Heuven, Virginie Vergne, from left to right)

Biarritz: Côte des Basques
(photo T. Van Heuvel)

San Sebastián
( Photo T. Van Heuvel)

Abbadia Estate, Hendaye
(photo Emilie Milon)

Saint Jean de Luz (photos Tjark Van Heuven)
### 28th October: Field trip along the Basque Coast
From Biarritz to San Sebastián

Leaders: Cyril Mallet and Christophe Garnier (BRGM)
with the help of Alistair Brockbank (CPIE Littoral basque)

#### Stops, topics and main contributors

<table>
<thead>
<tr>
<th>Start from Biarritz in bus at 8:00</th>
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| **Stop 1: Biarritz Light’s house, Cap St Martin**  
Overall presentation of Anglet and Biarritz beaches and cliffs. Issues on coastal management.  
Contributors: BRGM, University of Pau & Pays Adour, stakeholders of ACBA (Caroline Sarrade) |
| Route in bus |
| **Stop 2: Côte des Basques, car park Beaurivage, point of view from the top of the urbanized cliffs**  
Historical and recent cliffs protections management and concerned stakes.  
Contribution of an elected representative to explain the local authority strategy past and future  
Presentation of the geotechnical parades |
| Route in bus |
| **Stop 3: Guéthary, Alcyons, walk along the Harotzen Costa beach**  
Landslides and beaches erosion strategies adopted by local authorities along the small harbor, coastal pathways, cliffs and pocket beaches: presentation by the Mayor of Guéthary, Albert Larrousset  
Geological presentation by BRGM (Cyril Mallet and Christophe Garnier)  
Management of erosion and submersion risks (Caroline Huveteau, Agglomération Sud Pays Basque)  
Nature marine reserve: presentation by the Centre de la mer de Biarritz (Iker Castège and Emilie Milon) |
| Route in bus to Hendaye |
| **Stop 4: The Basque “Corniche”, Abbadia’s Estate, Asporotsttipi Farm, Hendaye**  
Walk to the cliffs and sea view, description of the geology and moor landscape  
History of the Abbadia’s Estate  
Presentation by the Conservatoire du littoral (Patrick Bazin)  
Contribution by CPIE, NGO in charge of the presentation and valorization of the Basque Coast to the public (Alistair Brockbank) |
| Picnic lunch - welcome area at the Asporotsttipi Farm |
| **Stop 5: the San Sebastián Bay**  
Brief history of the town and harbor. Description of the geology and landscapes.  
Contribution by CPIE (Alistair Brockbank) |
| Route in bus to Saint Jean de Luz |
| **Stop 6: Visit of Saint Jean de Luz**  
Brief visit of the historical center and walk to the bay with Itsas Begia (Christian Ondicola)  
Presentation of marine hazards concerning the seawall protection and historical marine submersion |
| Return to Biarritz |

Note that a guide-book was given to the participants (in French and English)
A few pictures of the field trip along the Aquitaine sandy coast (29th October)  
(note that maps, sketches and many other photos illustrate the guide book)

Especier-Mimizan: Public dune management by the National Forest Organization (ONF)  
(photos Y. Battiau-Queney; L. Gouguet; B. Papion)

Several pictures of the Pilat dune (photos Y. Battiau-Queney, B. Papion, T. Van Heuvel)
Field trip along the Aquitaine sandy coast - 29th October
Capbreton - Pilat dune - Arcachon Basin
From Biarritz to Bordeaux (with possible return to Biarritz)
Leaders: Loïc Gouguet (ONF) and Marie-Claire Prat (University of Bordeaux)

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| **Stop 1: Capbreton Car park of the "estacade"**  
Overall presentation of Capbreton. Erosion issues and by-pass  
Contributors: Marie Claire Prat (University of Bordeaux) and BRGM (French Geological Survey) |
| **Route in bus** |
| **Stop 2: Capbreton Beausoleil car park**  
Site of dune restoration in 2016  
Walk along the dune footpath (from Beausoleil to the CCAS holiday residence)  
- Contribution of an elected representative to explain the municipal stakes  
- The story (vineyard…)  
- Presentation of the project by ONF (Office National des Forêts)  
  - Technical aspects  
  - Results  
  - the citizen participation |
| **Route in bus** |
| **Stop 3: Especier (south of Mimizan)**  
- Management of state dunes (Loïc Gouguet, ONF)  
- Shoreline survey (Observatory of the Aquitaine Coast)  
- Biological Reserve |
| **Route in bus to the Pilat dune** |
| **Stop 4: Visit of the Pilat dune (the highest European dune) with wonderful view over the Arcachon Basin**  
- History and geology of the Pilat dune (J.P. Tastet)  
- Climbing of the dune from the staircase and walk on the dune to the central area  
  - Presentation of the site: passes and channels of Arcachon Basin, Pilat dune, history (Marie Claire Prat)  
  - Development of the dune: BRGM  
  - The "Great Site", public welcome: contributions of the "Syndicat mixte" and "Conservatoire du littoral" (Maria de Vos)  
  - the Gaillouneyes site: restoration of the south area of the Pilat dune (presentation of the project by Loïc Gouguet and Cédric Bouchet, ONF and the Conservatoire du littoral’’) |
| **Route to Bordeaux or return to Biarritz** |