

THE FIRST ALPINE GEOFESTIVAL® IN BEAUFORTAIN

LE PREMIER GEOFESTIVAL® DU BEAUFORTAIN EN SAVOIE

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ABSTRACT

The Beaufortain alpine Massif is a well defined geological, geomorphological and human entity situated in Savoy between Mont-Blanc and Vanoise Massifs. It exhibits through fantastic landscapes a very complete geological cross-section across the Western Alps, through old Hercynian basement rocks, alpine sea deposit and Valais small ocean and basin fill deposits.

For a few years already, local geologists have worked with passion to simplify the geological story of this massif and to make it accessible to all local and visiting public, through Conferences and article first, then through 8 editions of a one day geowalk fieldtrip where the story of the massif is simplified and told through 10 selected rock samples and where most magnificent landscapes are explained. These fieldtrips, including one dedicated to local guides, found a big success and interest among the population.

In 2011, The Beaufortain community celebrated the 50 years anniversary of the Famous Roselend – La Bathie hydro-electric complex. On that occasion, and in addition to many festivities organised this year on Roselend site, local geologists have proposed to organise the first edition of a Geofestival® with the aim to explain to a wide public the geology and geomorphology around the Roselend glacial depression and to focus on the applied geology of its dam. Such proposal was immediately and warmly welcomed and received by local authorities, especially Beaufort Mayor, the organising committee and EDF Company through its local representatives. This festival took place on 17-18 Septembre 2011, and was selected as the unique activity that weekend in Beaufortain for the "Journées Européennes du Patrimoine". On Saturday were organised 8 short talks from geology setting to local Roselend geomorphological setting, to dam geology, dam selection / design, and dam security and maintenance, plus a festive musical evening. On Sunday were organised 3 half-day geowalks, one explaining on site the Roselend depression geology and geomorphology, one focussing more closely on the Roselend dam geology and the third one explaining the research programme performed on a natural rock laboratory within a gallery through the Roselend dam rock massif.

The first alpine edition of the Geofestival® met a large success with 300 persons attending the conferences and exhibition on Saturday and 100 persons attending the 3 geowalks, braving awful weather in the rain, cold and clouds.

The first Geofestival®, a new concept, took place in Brittany first in 2009 and was proposed by the non-lucrative association Géomnis in collaboration with the Ecole des Mines ParisTech. It was created :

- to share with the public simplified but correct scientific knowledge

- to discover with new eyes the environment we leave in or we visit and to embellish it as a natural, historical AND cultural heritage site via all aspects

- to state clearly the close links between geology, biodiversity and human activities.

The Geofestival® is now in the process of developing internationally through a cross-cultural environmental approach.

Following the success of the first Geofestival® in Beaufortain, it has been agreed to repeat such festival every two years. The topic of the next edition around summer 2013 will be « Stones and People in Beaufortain Massif ».

KEYWORDS: BEAUFORTAIN MASSIF, GEOFESTIVAL, ROSELEND, GEOLOGY, DAM.

RÉSUMÉ ETENDU

Le massif alpin du Beaufortain est une entité très bien définie au niveau géologique, géomorphologique et humain, situé en Savoie, entre les massifs du Mont-Blanc au nord et de Vanoise – Belledonne au sud. Il montre à travers des paysages fantastiques de moyenne montagne une coupe géologique très complète des Alpes occidentale, comprenant les vieilles roches du socle hercynien, les sédiments déposés dans la mer alpine et le petit bras océanique valaisan, comblés par les sédiments du sillon valaisan. Depuis plusieurs années déjà, les géologues locaux s'attellent avec passion à simplifier l'histoire géologique de ce massif et de la rendre accessible à tous publics, locaux et vacanciers, au travers initialement de conférences et de publication, puis par des géopromenades racontant « le Beaufortain en 10 cailloux » et décryptant la géologies des paysages à partir de magnifiques point de vue, tel le Col du Joly. Ces géopromenades continuent de rencontrer un vif succès auprès de la population locale en priorité. En 2011, Le Beaufortain a célébré le cinquantenaire du bien connu Barrage de Roselend. A cette occasion, et en plus des nombreuses festivités organisées autour de cet anniversaire, les géologues locaux ont proposé d'organiser le Premier Géofestival® du Beaufortain, avec pour objectif l'explication simple pour tout public de la géologie des barrages, en partant de la géologie régionale autour du vallon de Roselend, passant par la géomorphologie glaciaire qui a façonné ce site avec un verrou et une dépression glaciaire en amont, menant à la géologie particulière de ce site et le choix très original et mondialement reconnu d'un ouvrage à voute et contrefort pour épouser le profil asymétrique de la vallée au travers du verrou. Cette proposition fut accueillie avec grand enthousiasme et soutien par la Mairie de Beaufort, les conférenciers spécialistes sélectionnés et les ingénieurs locaux de EDF. Ce Festival a pris place les 17-18 Septembre 2011 et fut également

l'activité du Beaufortain pour les "Journées Européennes du Patrimoine". Le Samedi 8 petites conférences ont été données simplement sur l'approche d'un Géofestival®, la géologie, puis la géomorphologie du vallon de Roselend, géologie des barrages, choix de l'ouvrage pour ce site, alimentation du bassin versant par 100 Km de galeries, maintenance et sécurité du barrage, et pour sur le Rocher de Roselend, un laboratoire naturel de recherche dans une ancienne galerie EDF désaffectée. Pour terminer ces conférences, une soirée musicale et festive autour d'un vin local des ardoisières de Cevins et de plusieurs expositions ! Le dimanche, 3 géopromenades furent organisées dans le vallon de Roselend, le site du barrage et le laboratoire naturel de recherche, pour voir sur le terrain tous les aspect aborder la veille dans les petite conférences. Ce Premier Géofestival® du Beaufortain a rencontré un vif succès, avec la participation de 300 personnes le Samedi aux cycle de conférences et 100 personnes pour les 3 géopromenades du Dimanche (sur réservation, complet 10 jours avant), bravant un temps horrible de froid, pluie et brouillard !!

Le Géofestival®, concept nouveau, fut proposé par l'Association Géomnis, en collaboration avec l'Ecole des Mines ParisTech. Il a été créé en 2009 en Bretagne pour rendre visible et fédérer un territoire, la "Bretagne de grès rose" qui s'étend d'Erquy au Cap Fréhel sur la côte Nord. La manifestation focalise le travail réalisé durant l'année, de la maternelle aux plus anciens. Le Géofestival® a déjà essaimé à Fontainebleau et dans le Gâtinais avec une Réserve de Biosphère Unesco, le chateau, le Parc Naturel Régional et de très nombreux acteurs sur 126 communes. Il prend aussi une dimension internationale avec une exposition "Un art des pierres", présentées dans leur état naturel, été 2011 dans le Géoparc Unesco de Brecon Beacons au Pays de Galles. Des contacts sont en cours en Chine et au Japon.

Le Géofestival ® est un événement festif et pédagogique, qui a pour objectif de :

- sensibiliser au lien entre les activités humaines, la biodiversité et le sol avec sa géologie. Trop souvent le minéral est oublié alors qu'il structure les paysages, conditionne la flore et la faune et détermine les territoires;
 - créer des "regards croisés" entre les savoirs locaux et les sciences, les partager avec tous, habitants et visiteurs, en s'adressant à tous les publics de façon accessible;
 - voir autrement le territoire que nous habitons ou visitons et le valoriser comme un patrimoine naturel ET culturel sans opposer les deux aspects.
- Le concept Géofestival® est en train de se développer au niveau international, au travers d'une approche environnementale multiculturelle.

Suite au succès de ce premier Géofestival alpin en Beaufortain, il a été décidé de renouveler cet événement festif tous les deux ans. Le sujet du prochain Géofestival du Beaufortain au cours de l'été 2013 sera « Des pierres et des hommes en Beaufortain ».

MOTS CLÉ : MASSIF DU BEAUFORTAIN, GEOFESTIVAL®, ROSELEND, GÉOLOGIE, BARRAGE.

INTRODUCTION

This short paper will describe why and how was organised the first alpine Géofestival® in the Beaufortain Massif. We presented the paper on 08th September during the ISGM conference in Bauges Massif, actually 10 days before the festival took place. We are writing the paper six months after this festival, which took place on 17-18 September 2011 in Beaufort. This paper will also present the content of the Géofestival and explain the new concept of a Géofestival®. Finally we will review how the festival went and describe briefly the next edition planned around summer 2013.

The Beaufortain Alpine Massif is a well defined geological, geomorphological and human entity (**figure 1**), situated in Savoy between Mont-Blanc and Vanoise massifs. It contains 4 villages, 4 hydro-electric dams, a bit more than 4000 people, a bit less than 4000 cows giving their alpine milk to make an excellent mountain cheese : « the Beaufort ».

This year in 2011, The Beaufortain community celebrates the 50 years anniversary of the world famous Roselend Dam hydro-electric complex. On that occasion, and in addition to many events organised on the Roselend site, local geologists have proposed to organise the first edition of an alpine Geofestival® (**figure 2**) with the aim to explain to a wide public the geology, geomorphology around the Roselend glacial depression and focus on the applied geology of building a dam. Such proposal was immediately and warmly received by the local authority (Beaufort Mayor), the organising committee and EDF Company, owner of the Roselend dam.

Figure 1 – Title fig. 1. Beaufortain typical landscape , valley leading to Arêches and summit Le Grand Mont.

Figure 2 – Title fig. 2. Poster advertising the first Géofestival® in Beaufortain, sky view of the Roselend dam and valley

I – FOUR YEARS OF LOCAL GEO-TOURISM IN BEAUFORTAIN MASSIF

The Beaufortain massif exhibits through fantastic landscapes a very complete geological cross-section across the Western Alps, from old Hercynian basement rocks, to Alpine sea deposits, followed by Valais small ocean and basin fill deposits. The peculiarity of this Beaufortain massif is that the rugose crystalline massifs are plunging and disappearing below the surface, letting in place a sheet of softer alpine sea sediments between Belledonne and Mont Blanc massifs (**figure 3**). These sediments, mostly dark shales, provide quality soil for alpine meadows, rich grass, mountain flowers and relative gentle slopes after glacial erosion, ideal for the « tarine and abundance » cows.

How did geo-tourism start in Beaufortain ? Back in 2003, a geologist G. De Broucker, who came to live near Beaufort in 1992, discovered the geological beauty and variety of the massif. He proposed naturally an original project to the « Communauté de Communes », together with BRGM : to prepare a large simplified geological map where all the collected rock samples of the massif (main summit and passes) would be placed on their relevant location, this way helping every one to make an easy link between the colors and units of the geological map and the various rocks visible while hiking throughout the massif. This project, despite being well received by local authority, was not yet attractive to the wider community. Actually we discovered it takes time for a new project to make his way. But we continued to be convinced of the geological potential and found other ideas to share it. We realised more and more that explaining the geological history based on geological map was quite a difficult challenge, integrating rock deposition and deformation through time and space... a dead end in fact for a wide audience. While testing ideas, a very valuable remark came one day : « why you don't simply tell us a story ? » From there came the simple idea to tell the story of the massif from some 600 million years to today using 10 selected stones coming from the 3 main parts of the large scale Beaufortain geological puzzle : the old basement, the alpine sea and Valais fill deposit (**figure 4**).

So, local geologists, in their spare time, have worked with passion to fully understand and simplify the geological story of this massif and to make it accessible to all local and visiting public. We started with a Conference, followed by a published paper (De Broucker and Potié, 2008). The people, following the success of this story told us then « to show those 10 stones in reality, in their context in the mountains ». This way was created this one day geowalk fieldtrip, where the story of the massif is simplified and explained through 10 selected rock samples and most magnificent landscapes. These fieldtrips found a big success and interest mainly among the local population (to be noticed : less than 15% tourist participation so far). It has been run 8 times (25 people each time) during the last 3 years. Our experience is that when we explain geology and geological landscape with passion in an easy and fully accessible language, with logical steps in landscape description, simple drawings, linking observations to large scale plate tectonics and mountain building, people really enjoy it and « feel like geologists » at the end of the day, even if most of the story and names are forgotten the next day ! What counts is experiencing the geological story. A good end to each day fieldtrip is an exam where people in 3 groups have to reconstruct the rock succession in time of the 10 stones, in 3 depositional settings. Always a very lively and ludic moment, helping every one to summarize the whole day observation in one rock panel (**figure 5**).

Figure 3 – Title fig. 3. Mont-Blanc cristalline basement plunging southward below surface in Beaufortain, keeping a sheet of alpine sea deposits, ideal for alpine meadows, cows and quality Beaufort cheese

Figure 4 – Title fig. 4. Simplified Beaufortain geological map with 3 key zones and simple legend with 10 key stones

Figure 5 – Title fig. 5. End of the 10 Beaufortain stones geowalk, with an exam replacing the 10 stones in the 3 zones in geological order !

II – FROM BEAUFORTAIN GEO-WALKS TO THE FIRST ALPINE GEOFESTIVAL®

During a Geowalk summer 2010 organised for all the local councils from the 4 Beaufortain villages, The Beaufort Mayor Annick Cressens asked G. De Broucker if he could organised a Géofestival in Beaufort ? Indeed she just visited Erquy, a village in Brittany, where Marc Lucas organised the first one in June 2009, followed by second and third editions in 2010 and 2011 (**figure 6**). Such proposal was welcomed by the local geologists, as we felt the local population was ready for it, based on the 10 stones geowalk experience. The topic of explaining Dam geology was selected on the occasion of the 50st anniversary of the Roselend dam during summer 2011. We discussed the programme and prepared it together with Pierre Antoine, geologist of the “Comité Technique Permanent des Barrages”, we decided to start from regional geology, link it to the glacial geomorphology setting, before focussing on dam geology and the correct design for this difficult valley geometry in Roselend. We engaged at that point engineers from EDF (Electricité de France), a key step to complete the round of conference with the dam security and maintenance.

This event took place on 17-18 Septembre 2011, and was selected as the unique activity in Beaufortain on the occasion of the “Journées Européennes du Patrimoine” that weekend. On Saturday were organised 8 short talks from geology setting to local Roselend geomorphological setting, to dam geology, dam selection and design, and dam security and maintenance, plus a festive evening. On Sunday were organised 3 half-day geowalks, one explaining on site the Roselend depression geology and geomorphology, one focussing more closely on the Roselend dam geology and the third one explaining the research programme performed on a natural rock laboratory within a gallery through the Roselend dam rock massif.

Figure 6 – Title fig. 6. Second edition of the Brittany Geofestival in 2010

III – A GEOFESTIVAL®, WHAT IS IT ?

The first Geofestival®, a new concept, took place in Brittany first in 2009 and was proposed by the non-lucrative association Géomnis in collaboration with the Ecole des Mines ParisTech. It was created : 1- to share with the public simplified but correct scientific knowledge, 2- to discover with new eyes the environment we leave in or we visit and to embellish it as a natural, historical AND cultural heritage site via all aspects, and 3- to state clearly the close links between geology, biodiversity and human activities.

The Geofestival® took place first in The Brittany of Red Sandstone during summer 2009-2012 and 2011 in the Erquy – Cap Fréhel région. In 2011 it took place in Fontainebleau and Gâtinais région, in close cooperation with UNESCO Reserve « Man and Biosphere ». Also in 2011 a collaboration took place with the Geopark of the Brecon Beacons National Park (Wales). It is now in the process of developing internationally in China, Japan and Russia, through a cross-cultural environmental approach.

Why and how a Geofestival® ? One observation to start with, on the Erquy beach (**figure 7**), we all, local citizen or tourist, come to this beach and do not see the red sandstone cliff in front of us, we establish no link. We sit and lay on the sand grains and make no link where they come from. We live our lives but make no or very few links with the nature around us.

Geofestival® starts from a simple observation : The french term « Nature » is disappearing today from our language. We speak more about environment and biodiversity than nature. Why do we speak more about environment ? because of the increased urbanisation and industrialisation, also because french is a catholic and cartesian man and feel the center of the world. Why do we speak more about biodiversity ? because nature equal life and living matter is superior to everything else. Moreover, the mineral world does not exist for urban inhabitants. But... clearly Geology structures all the landscapes and conditions the biodiversity and human activities. Why such an exclusion ? Because our outlook at nature is mostly cultural. One of the possible explanations is that mentalities advance slowly, therefore ancient “ patterns ” of thinking are still present in our behaviour today. And these ancient “patterns of thinking” do exclude the mineral matter.

The Geofestival® is a cultural and festive event helping : 1- to think the management of a territory, a region, 2- to increase tourism through a different and new outlook including geology, 3- to invite inhabitants and visitors to appropriate, then valorize their territory by themselves, 4- to show that a territory is a heritage, and 5- to present this heritage as a whole with all its different dimensions dealt together (natural, historical and cultural).

The main principles of a Geofestival® are : bottom-up projects ! no fear ! scientific explanations understandable by everyone ! full respect of the local knowledges, appropriation of the projects by inhabitants and visitors, and proposal of a different outlook at the «nature ».

CONCLUSION : A SUCCESS WHICH WILL BE REPEATED !

Based on our local geo-tourism activities organised the past few years, where landscape explanation coupled with easy to understand geological history have been practiced with the local population, it has been quite natural to organise the first alpine Geofestival in Beaufortain, with a topic easy to choose on the occasion of the 50th anniversary of the Roselend dam. We have been surprised by the large attendance, some 300 people, to the Saturday programme, the level of genuine interest by all participants making a programme of 8 conferences for 4 hours a success, coupled with good exhibitions on geology and dam. We estimated the attendance some 60% from Beaufortain region and 40% from Albertville and beyond, Chambéry, Grenoble, Lyon and even Paris. On the second day, all 3 Geowalks were fully booked 10 days in advance with 102 persons attending, with no cancellation, despite real adverse weather conditions with a cold, cloudy and rainy day ! **(figure 8)**

The level of involvement of many specialists enjoying talking in easy words to a wide audience and the natural link between the 8 topics have been key success ingredients. Among those, the EDF (Electricité de France) great collaboration with technical sharing has been really appreciated by the public and key to the overall success of the festival. A 22mn film has been produced to celebrate and remember this first edition. Proceedings of all talks are being written and will be published. Various data of this Geofestival can be accessed through the official site (www.geofestival.fr) where our alpine Geofestival is also present.

Following the success of the first Geofestival® in Beaufortain, we aim to repeat it every two years. The topic of the next edition will be « Stones and People in Beaufortain Massif », establishing the link between Beaufortain natural resources (copper, Uranium, salt, slates, coal, marble, gems, etc.) and the local human experience associated with it.

Figure 8 – Title fig. 8. Geological explanation during one of the geowalks of the first alpine Geofestival in the Beaufortain massif.

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