ENGLISH

Interreg

EUROPEAN UNION

France (Channel Manche) England

Channel Payments for Ecosystem Services

CPES

European Regional Development Fund

Work Package T1

Implementation

Responsible: Westcountry Rivers Trust

Deliverable:

6 case-studies summary documents

November 2018

Interreg
EUROPEAN UNION
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Channel Payments for Ecosystem Services
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CPES

THE PROJECT

Launched in November 2017, the European Channel Payments for Ecosystem Services (CPES) project is a cooperation project managed within the Interreg VA France (Channel) England programme. It has a €4 million budget, co-financed by the European Regional Development Fund (€2.8 million), and runs for a 45 month period (2017-2020).

Fourteen partners are working towards a common goal: to improve water quality of lakes, rivers, groundwater tables, by implementing sustainable payments for ecosystem services (PES) schemes in six pilot catchments in Southern England and Northern France to strenghten the actions for changes in farmers' practices.

Among the innovative financial mechanisms, payments for ecosystem services (PES) are voluntary approaches in which land managers are paid to change practices by the beneficiaries of the ecosystem services. Previous projects have demonstrated the viability of PES to reduce diffuse pollutions but have not tested their environmental effectiveness and their financial sustainability at a larger scale.

Our different partners have proven experience in identifying and implementing measures for changes in agricultural practices in favor of water quality. However, the current mechanisms seems to face certain difficulties in achieving water quality objectives (low incentives, complex administrative and financial management, etc.). This explains their interest in an innovative scheme and their commitment to Interreg cooperation.

The Interreg project offers a unique experimental framework to test the construction and implementation issues of PES schemes. The ultimate goal of the CPES project is to demonstrate that PES is a cost-effective tool for solving diffuse pollution problems. It also examines the consistency of this scheme with the consortium of environmental policies and regulations currently in place, as well as their legal viability and monitoring and control mechanisms.

The diversity of issues and contexts is one of the strengths of the CPES project, which will allow replicability to other catchment areas, thanks to the construction of a toolbox made available to all stakeholders concerned with the quality of the water.

University of Chichester · Grand Bassin de l'Oust · South Downs National Park Authority · Portsmouth Water · Westcountry Rivers Trust · CIRS · INRA Science & Impact

Université de Rennes 1 · Southern Water · Environment Agency · Sara Hernandez Consulting · eau de Paris · SERPN · eau Seine Normandie

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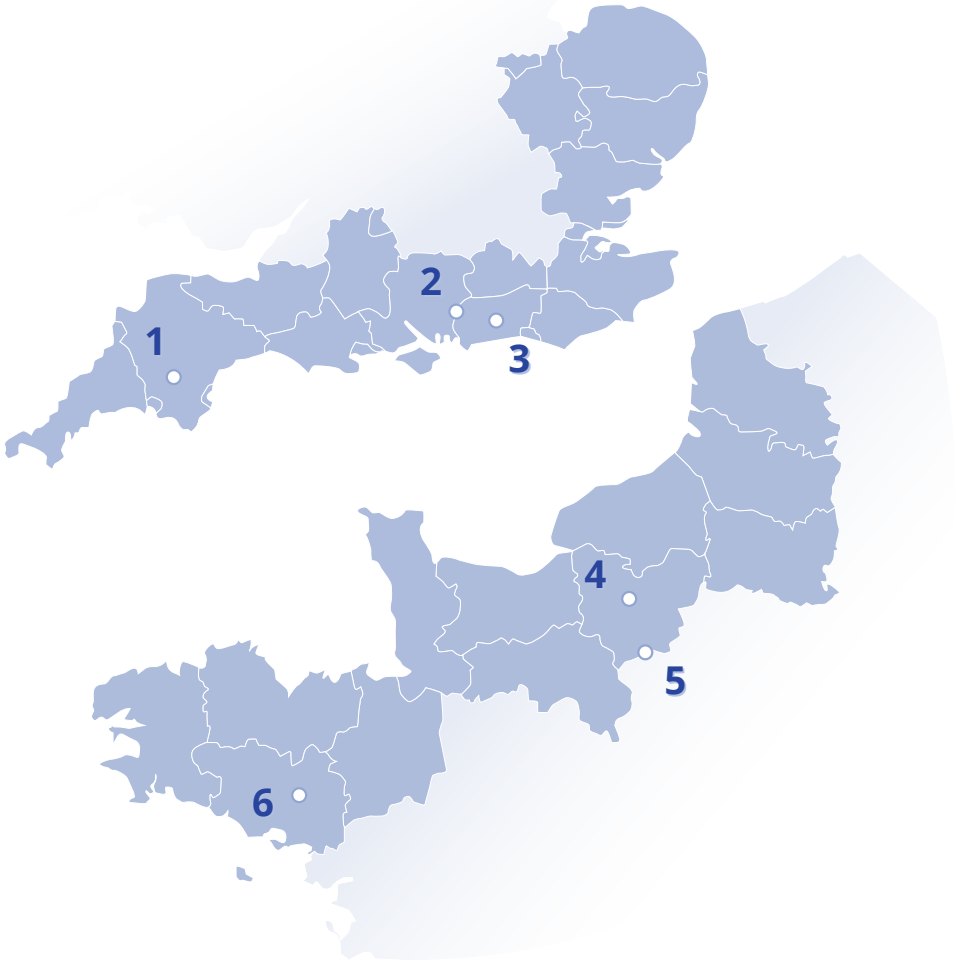
THE SIX CASE-STUDIES

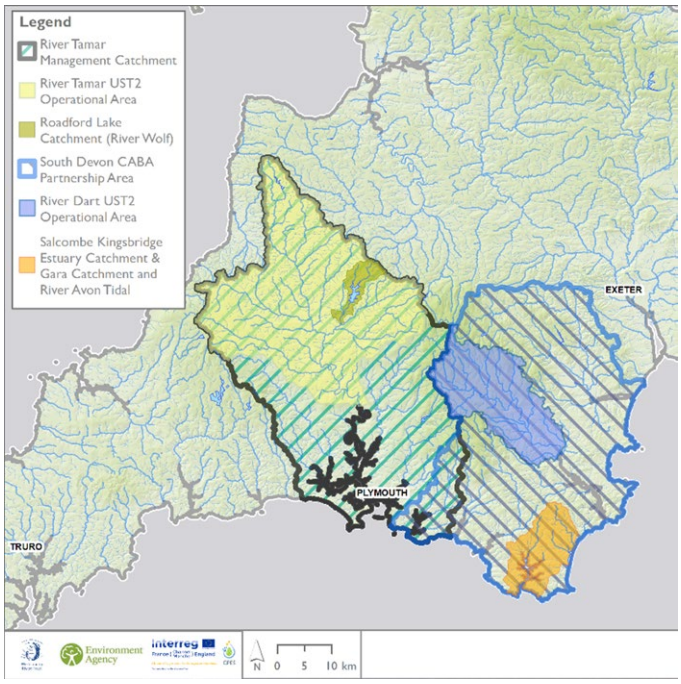


DEVON LAKE AND ESTUARY, UK

The CPES project has one pilot with six case study areas set up to investigate new payment mechanisms to increase environmental and societal benefits.

The **Devon Lake and Estuary case study** project builds on the success of the South West Water funded Upstream Thinking (UST) programme, levering other businesses connected with the farming community as well as to look at how schemes could work where there are fewer business drivers. The two case study areas are sited within the South Devon and are:

- **Salcombe Kingsbridge Estuary and Garra River**, which is part of the South Devon Catchment Partnership and Dart UST area.
- **Roadford Lake**, which is part of the Tamar UST area and Tamar Catchment Partnership.



Geographic Scope Report

The two areas have been chosen as they have very similar regulatory frameworks but different social demographics and stakeholder anaylsis. Therefore, the costs of inaction are very different for the two areas.

Salcombe Kingsbridge Estuary and Garra River is a key tourism area that increase in numbers dramatically in the summer months. There are numerous thriving businesses that trade off having a clean estuary including those directly using the Estuary (boating, bathing, shell fisheries and fisheries) and those connected to wider tourism (hotels, bed and breakfasts, restaurants, etc.). Additionally, there are other businesses that impact upon the river such as the agricultural sector, sewage company and private sewage from residents. The area was chosen as it has a high interest but potentially low ability to pay, therefore any scheme needs to be an achievable size and scale.

Roadford Lake is a more rural area than the Estuary and is dominated by agricultural businesses. The main local beneficiaries to improved water quality and catchment management are the drinking water company and the lake tourism business as well as some of the smaller industry manufacturers and food processors. This area was chosen as a test area to lever in additional support from business connected to and benefiting from the agricultural sector because of a large primary beneficiary. These include farm contractors, agronomists, food buyers, food manufacturers, food sellers (super markets), regulators, advisors, lenders and community groups.

Examples of the problem with algal blooms and the impacts on tourism

State of the Environment

The two pilot areas were assessed in terms of their state of the environment using the Problem > Source > Pathway > Receptor > Impact model common to all case study areas.

The **problem** both areas face is from algal blooms. These are due to diffuse and point source nutrient pollution from a mixture of sources. In the Roadford lake these are agriculturally derived, whereas in the Estuary it is derived from a mixture of sources including agriculture, sewage treatment works and private septic tanks.

The **sources** of the pollutants come from point sources (slurry pits, sewage treatment works and private septic tanks) and diffuse sources (land applied fertilisers and slurries as well as nutrient bound within the soil).

The **pathway** the pollutants take to get to the river is relatively simplistic for point sources of nutrients but is more complex for diffuse sources of pollution. These pathways have been modelled to assess the risk of erosion and nutrient loss.

The **receptor** was also assessed as nutrients have a variable residency time in the lake compared to the estuary. Additionally, the two sites have different statutory designations, with the lake being a Drinking Water Zone and the estuary being a Marine Protection Zone and a Special Area of Conservation.

The **impact** of the algal blooms between the two sites are variable. On the Estuary it causes problems for boating stakeholders but the high nutrient loading and associated fecal coliforms impact on bathing water, shellfisheries as well as tightening discharge standards for the sewage treatment works. On the Lake it causes it causes reduction in water-based tourism as well as slowly filling up the drinking water lake reducing capacity, clogging abstraction points and increasing water treatment costs. There are also downstream impacts on water availability and quality for manufacturing and final estuary water quality within the river Tamar.

Contact

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SOUTH DOWNS GROUNDWATER, UK

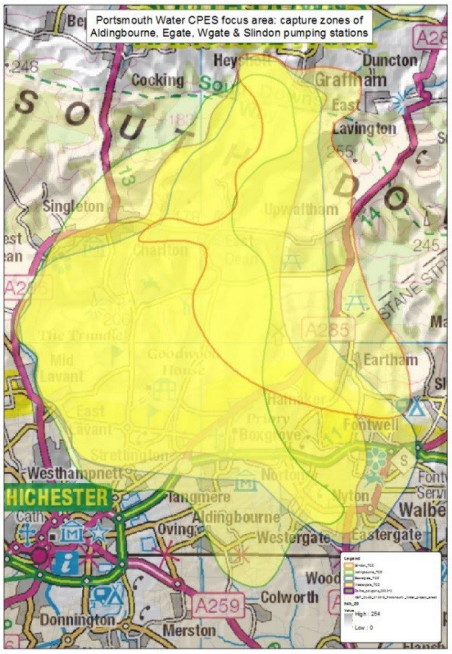
The CPES project has one pilot with six case study areas set up to investigate new payment mechanisms to increase environmental and societal benefits.

The **Portsmouth Water** project builds on the company's existing catchment management programme, itself a development of the Downs & Harbours Clean Water Partnership that began in 2008.

The principal concern is rising nitrate in groundwater sources. The two case studies are sited within Portsmouth Water's supply area are cover crop trials and options for trees and forestry.

Geographic Scope Report

Portsmouth Water has 11 supply areas that are of concern regarding drinking water abstraction. The most pressing area is the Eastergate group of abstraction boreholes. Although there are multiple stakeholders, the principal sellers of the scheme are farmers and principal buyer is Portsmouth Water.



The 'Eastergate group': Eastergate, Westergate, Aldingbourne & Slindon

The two approaches that Portsmouth Water (PW) is trialling are (1) cover cropping and (2) the use of trees and forestry to reduce nitrate losses.

The main stakeholders are PW (buyers) and farmers (sellers) of the PES scheme. Catchment Management approaches would allow Portsmouth Water to operate a more cost effective approach over end-of-pipe treatment and farmers to maintain their incomes. Other stakeholders include The South Downs National Park, the Environment Agency, Natural England and other conservation groups, all of which have a vested interest in protecting and enhancing the environment, including that related to regulation, e.g. the Water Industry National Environment Programme (WINEP), the Drinking Water Inspectorate (DWI) and Ofwat, the economic regulator of water companies. PW customers and the general public are both direct and indirect stakeholders by benefitting from cost-effective improvements in water and the enhancement of their local environment.

A SWOT (Strengths/Weaknesses/Opportunities and Threats) analysis shows a broad range of stakeholders who gain integrated benefits of a PES approach. Principal constraints to PES are the willingness of farmers to adopt such schemes, economic feasibility in the long term (i.e. financial support and stable markets), uncertainty to Brexit and new UK farming rules.

Failure to put in any measures would, e.g., prevent any potential nitrate reduction and associated environmental improvements and could promote costly nitrate removal. Economic impact of successful measures would include increasing profitability and sustainability for farming, potential new markets and innovation, and improvements in recreational activities.

Examples of the problem with algal blooms and the impacts on invertebrate conditions below algal mats

State of the Environment

The Eastergate group was assessed in terms of their state of the environment using the Problem > Source > Pathway > Receptor > Impact model common to all case study areas.

The **problem** is high nitrate in raw waters derived from groundwater used for drinking and which also are sources for local chalk-fed rivers and directly feed into protected harbor and near shore marine areas. For the former, on top of a general rising level, 'spikes' of nitrate exceed the legal 50mg/l drinking water allowance. High nitrate levels also cause excessive algal growth in estuaries and protected harbours, which affect fauna and flora by smothering important inter-tidal areas.

The **sources** of the pollutants come from diffuse sources, such as nitrate fertilisers, slurries and other soil additives both from high use in past decades and from current losses+, point sources, including slurry pits, sewage treatment works, landfill and private septic tanks.

The **pathway** the pollutants take include percolation of nitrate through soil strata – vertically and laterally – and via direct, very rapid movement via swallow/sink holes and dolines (aka karstic features) and fractures and fissures within the predominating chalk bedrock, all of which are of particular significance in the Portsmouth Water supply area.

The **receptor** comprise Portsmouth Water boreholes and Havant and Bedhampton Springs, local rivers – particularly those that are chalk-fed, such as the Meon, Chichester, Langstone and Portsmouth Harbours, the River Hamble estuary and the greater Solent estuary.

The **impact** is for Portsmouth Water to blend with sources with lower levels to provide drinking water that is compliant to the regulated maximum level of nitrate, 50mg/l. If levels in low nitrate sources start rising and blending becomes ineffectual, Portsmouth Water would need to consider installing a highly costly nitrate treatment plant that may impact on customers' bills. The impacts in near shore environments, nitrate (with other pollutants, such as phosphate) include smothering important intertidal areas, suffocating plant species and causing anoxic – and thus inhabitable – conditions for invertebrates that many bird species feed on. As nitrate and other pollutants resident in groundwaters may take decades to clear, noticeable environmental improvements may take a similar period of time.

Contact

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WESTERN ROTHER CATCHMENT, UK

The CPES project has one pilot with six case study areas set up to investigate new payment mechanisms to increase environmental and societal benefits.

The **Western Rother** case study project is led by Southern Water who are launching a catchment management programme aimed at improving the raw quality (i.e. untreated quality) of water supplies in this catchment.

The Western Rother lies within the Arun & Western Streams catchment in West Sussex which is located within the South East of England.

Fig.1 - Soil erosion in the Rother valley

Geographic Scope Report

The Western Rother is a lowland river flowing through a predominantly rural catchment, dominated by agricultural businesses and small urban centres. The area is characterised by its underlying geology which is a mixture of Chalk and Lower Greensand. The whole catchment lies within the South Downs National Park – a UK landscape of national importance.

Southern Water abstract water for public supply at Hardham, which is located at the bottom end of the river. The main beneficiaries of improved water quality and soil management are Southern Water (as the water and waste water company), local farm businesses, the agricultural supply chain, flood risk management authorities and the South Downs National Park Authority with regards to improved landscape character and biodiversity.

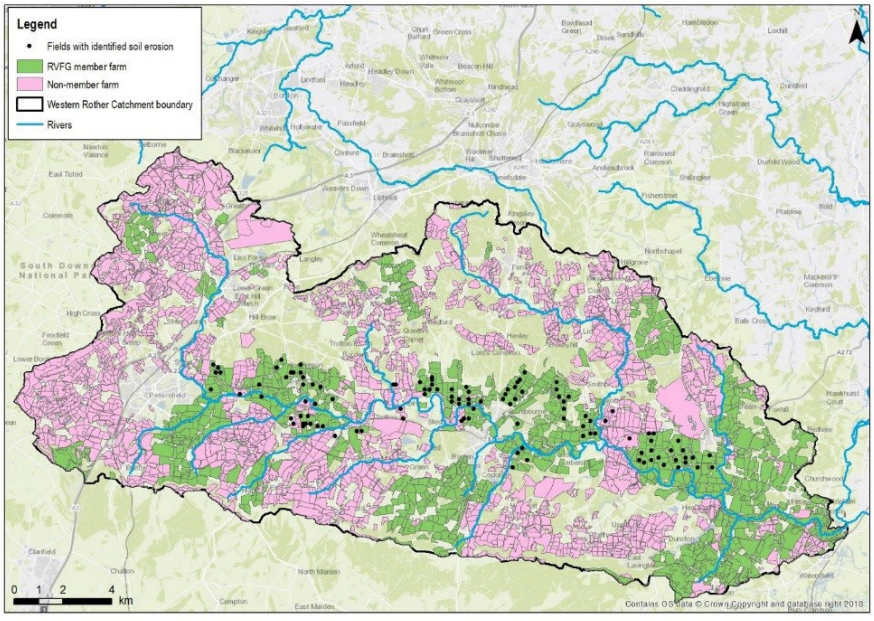

Fig.2 - Fields experiencing soil erosion and directly connected to the river network (Boardman, 2018)

Fig.3 - Western Rother desilting upstream of Hardham weir, October 2018

State of the Environment

The pilot areas were assessed in terms of their state of the environment using the Problem > Source > Pathway > Receptor > Impact model common to all case study areas.

The principal **problem** the Western Rother faces, and which is the focus of this case study, is surface runoff production from the easily worked sandy and loamy soils associated with arable land use. This generates diffuse pollution in the form of pesticides, fertilisers and exceptionally high rates of soil erosion/sediment – the Lower Greensand soils are highly erodible (Boardman et al, 2009) – see Figure 1 (photo courtesy of I. Boardman).

The **sources** of the diffuse pollutants are arable fields with hydrologic connectivity to the river network. Water quality monitoring and recent research is helping to identify 'hot-spots' within the catchment, (Boardman et al, 2009; Evans et al, 2017; Sediment & Mitigation Actions on the River Rother (SMART) project, 2018).

The **pathway** is complex for the diffuse sources of pollution. Sediment and pollutants can be mobilized during rainfall events through surface runoff production and where hillslope-river network connectivity exists, transported directly into the river system. The SMART project has mapped field connectivity across the Rother catchment (see Figure 2). Once the hillslope–derived diffuse pollution enters the river network it is then transported, or deposited and subsequently entrained over time, through the river system to the receptor. The Accounting for Sediment Transfer of the Rother (A-STAR) project has modelled this transport.

The **receptor** is the river and Southern Water's Hardham Water Treatment Works which takes water from the river to be treated for public water supply. The river is currently assessed as not being at good status in terms of water quality or wildlife. This is principally due to pesticides and the impact of sediment clogging spawning gravels for salmonids. Pollutants need to be removed from the water to make it safe for public consumption (in line with UK drinking water quality standards).

The **impact** is the cost to Southern Water and its customers of treating these pollutants to meet drinking water quality standards. Sediment arising from soil and river bank erosion also causes the river to silt up and there are costs associated with removing this silt to keep the abstraction point clear and to reduce flood risk (see Figure 3).

Contact

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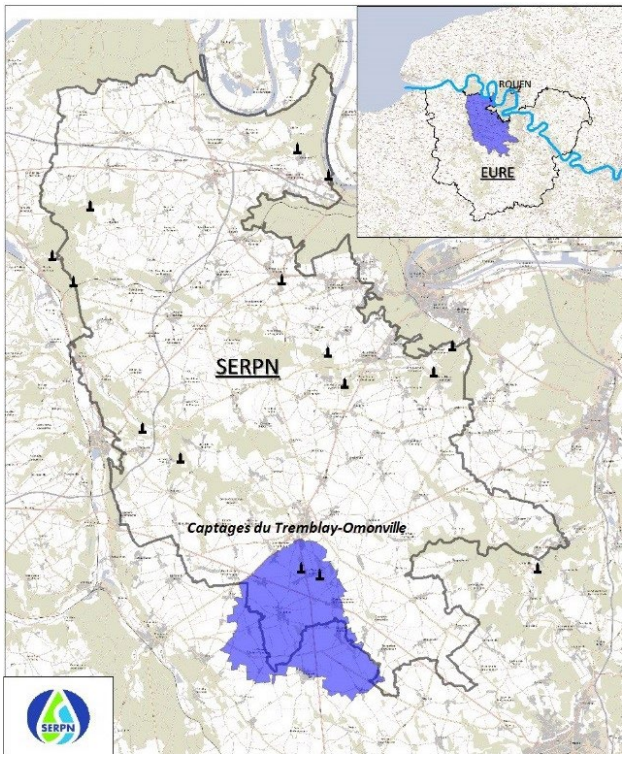
TREMBLAY-OMONVILLE CATCHMENT, FR

The CPES project has one pilot with six case study areas set up to investigate new payment mechanisms to increase environmental and societal benefits.

The Syndicat d'Eau du Roumois et du Plateau du Neubourg (SERPN) is a public authority, in Normandy, charged with the production and distribution of drinking water throughout 100 municipalities. The **Tremblay-Omonville** water catchment areas represent 2 of the 13 water catchments areas operated by the SERPN.

The case study is the Tremblay-Omonville catchment areas. SERPN plans to experiment with an Environmental Services Payment in order to supply high quality water from these two catchments. Indeed, the water collected in this area has nitrate concentrations ranging from 45-50 mg/l, a situation that has been confirmed to be increasing according to data from the last ten years.



Location of Tremblay-Omonville catchment

Geographic Scope Report

The water produced by the Tremblay-Omonville catchments supplies 16 surrounding municipalities, which represents 11600 inhabitants out of the 73 100 inhabitants supplied by SERPN.

The Tremblay-Omonville catchment area covers 63 km², and 95% of this is agricultural, planted with crops. 125 farmers have at least one field in the catchment basin, 60 of whom plant 80% of the agricultural area. Farmers also consume the water derived from their land.

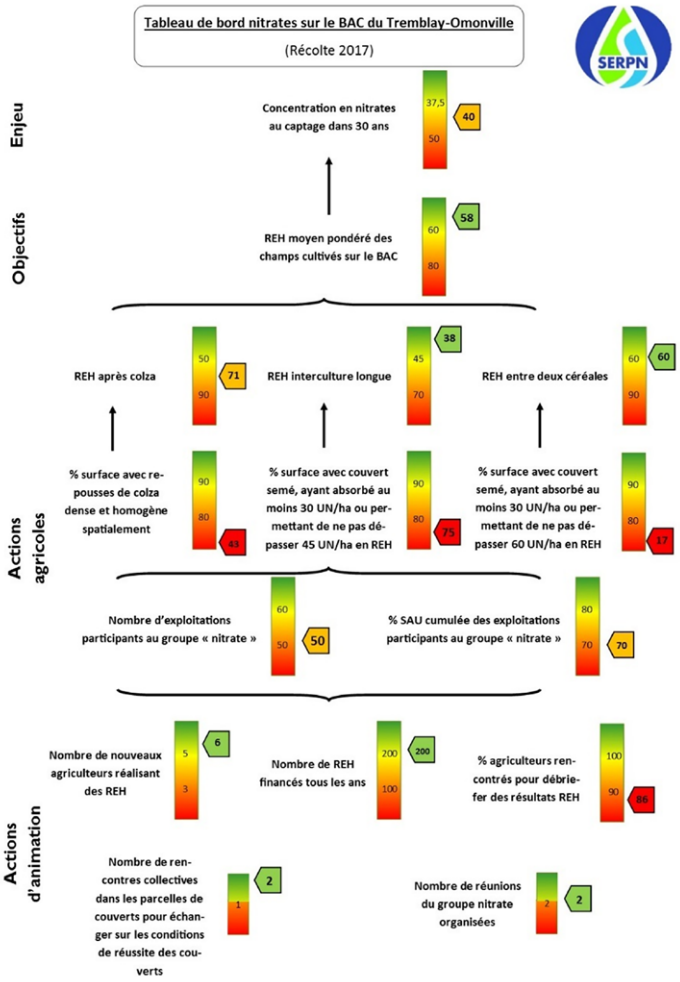
State of the Environment

The pilot areas were assessed in terms of their state of the environment using the Problem > Source > Pathway > Receptor > Impact model common to all case study areas.

The increase in nitrate pollution over the past 30 years is **problematic** but this has stabilized in recent years. Pesticides are detected very occasionally and rarely exceed standards (3 times in 10 years).

The **source** of pollutants comes from agricultural practices in origin. Effectively, agricultural land covers 95% of the catchment's surface area. Nitrates are introduced through excess fertilization by farmers and also from the mineralization of organic matter naturally present in agricultural land.

Fig.3 - Scoreboard of nitrates in the catchment , 2017



The nitrates found in the groundwater are nitrates leached into through agricultural land, the during for groundwater renewal period. The **transfer** is therefore made vertically through the different hydrogeological layers. In fact, the slopes have at most an incline of 1%. The thicknesses of the different hydrogeological layers are homogeneous, which gives the area a vulnerable homogeneous matrix. There is therefore not one area more at risk than any other with respect to nitrates.

The **impact** of agricultural practices on the nitrate concentration of the groundwater drawn from Tremblay-Omonville was assessed by a risk model named Nitrascope. This model allowed us to simulate changes (land under regrassing as part of the catchment surface area or the amount of nitrogen in the fields just prior to the groundwater renewal period) and to quantify their effects on nitrate concentration in catchments.

As a result, to reach a nitrate concentration of less than 37.5 mg/L in 30 years (infiltration time calculated on the catchment), it is necessary to either:

- Re-grass 700 ha
- Have an average nitrogen level in the fields at the beginning of winter of less than 60 kg/ha

These results were presented to the farmers. They preferred to focus on lowering the nitrogen level in the soil rather than replanting grass. Indeed, the catchment is located on an agricultural plateau with high potential, which makes it possible to produce a wide variety of crops (cereals, rapeseed, flax, sugar beets, potatoes) 30 km from the port of Rouen, the largest cereal port in Europe. Of the 125 farms concerned, only 10 maintain livestock.

Since 2013, soil nitrogen measurements have been carried out in winter (the winter residuals) in order to verify the average nitrogen level of the catchment area each year, as well as to allow farmers to modify their practices.

A performance chart for continuous improvement of practices has been developed with the agricultural profession. Individual and group working events have been proposed to the farmers in the group in order to analyse individual practices and share successes and failures. The group events are:

- Training to increase the needs and technical capacities of farmers
- Joint workshops to define the actions to be implemented to reduce residual values
- Visits to farmers' land to observe the outcomes of these practices in the field

Currently the group consists of 50 farmers, who plant 70% of the catchment's surface area. In order to increase the number of farmers in the group and thus have a greater impact on water quality, SERPN is involved in the CPES project to test the implementation of a payment based on this residue impact indicator.

Contact

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SPRINGS OF LA VIGNE CATCHMENT, FR

The CPES project has one pilot with six case study areas set up to investigate new payment mechanisms to increase environmental and societal benefits.

Eau de Paris, France's leading public water utility, is the municipal agency in charge of catchment, treatment and distribution of drinking water to three million consumers.

The **Sources de la Vigne** aquifer, located approximately 100 kilometres west of Paris, contributes to supplying drinking water with an average daily production of approximately 27,000 cu. m.

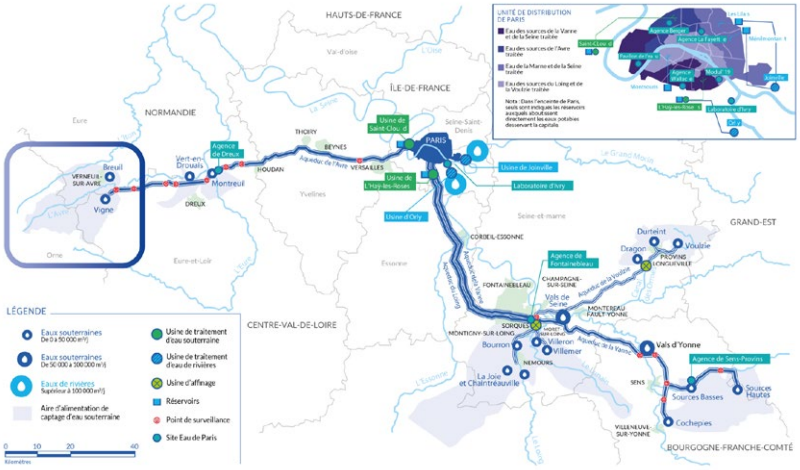

Diagram of the Paris drinking-water supply network

Geographic Scope Report

The catchment area of Les Sources de la Vigne – the area within which a drop of rainwater is likely to be collected by the La Vigne aquifer – represents 37,550 ha (approximately 380 sq km), two thirds in Normandy and the remaining third in the Centre Val-de-Loire Region. 40 townships exist within this territory. Therefore the local water authorities collect water from the same resource and encounter the same water-quality issues.

The land within the catchment area is characterised by high vulnerability to pollutants due to a karstic structure that encourages rapid infiltration. Agricultural land takes up 60% of the territory and approximately 300 farmers engage in agricultural practices characterised in their majority by simplified rotation of cereal crops and a decline in livestock raising.

State of the Environment

The pilot area was assessed in terms of its state of the environment using the Problem > Source > Pathway > Receptor > Impact model common to all case study areas.

- **Problem** = Pollution of the water resource before catchment by nitrates and pesticides
- **Source** = Diffuse pollution of agricultural origin (fertilisers, herbicides and pesticides)
- **Pathway** = infiltration and runoff - the territory's karstic structure encourages rapid infiltration
- **Receptor** = groundwater feeding the Sources de la Vigne aquifer
- **Impact** = deterioration of water quality before catchment over the long term

Avre aqueduct (Eure-et-Loir)

Day of training for farmers on the La Vigne catchment area

More information

The water-quality issues as regards supply of drinking water are related in particular to pesticides and nitrates. In 2007, Eau de Paris inaugurated a new pesticides treatment plant in Saint-Cloud (Hauts-de-Seine), but the Agency's goal is to reduce these diffuse pollution sources prior to catchment in order to guarantee water in conformity with drinking-water standards over the long term.

Eau de Paris has undertaken actions to protect the resource in collaboration with farmers since 1995. From the start, volunteer actions were used in order to create a territorial dynamic. Agricultural programs and individual and group accompaniment are deployed by the Agency, while individual diagnoses and local experiments (reduced-input systems, meadows for livestock raising) are proposed in partnership with the Chambers of Agriculture and agricultural-industry groups. Agri-environment-climate measures are have been sponsored by Eau de Paris since 2008. This financial aid, granted under the EU's Common Agricultural Policy, provides economic accompaniment for farmers as they change their practices. In complement, the Agency acquires land for the purpose of conserving it for agricultural use through rural leases containing environmental clauses. **The goal of these tools is to facilitate the transition towards sustainable agricultural systems that are beneficial to the water resource.** Lastly, Eau de Paris puts these actions into perspective with an ambitious program of monitoring of water quality in order to characterise their effects.

The status of commitments to agri-environment-climate measures or organic-agriculture systems by farmers within Eau de Paris's catchment areas demonstrates the effectiveness of the actions taken: 9,762 hectares of sustainable crops (agri-environment-climate measures + organic farming) in 2017, as against fewer than 2,000 in 2007. This positive dynamic of commitment to lasting changes in agricultural practices has begun to show its effects on the collection points. However, new expectations are emerging on farmers' part concerning the financial aids.

Eau de Paris therefore wishes to build a new system of aids that is clearer and more coherent, based on contracts adapted to the problems in each territory and drawn from this experience of 30 years. The goal is to define measures with specifications that are well known and stabilised before the commitment is made by farmers, appropriate to local agronomic realities and organised in a system of monitoring, accompaniment and aid that is coherent and under the control of Eau de Paris.

The new system is being co-constructed with selected farmers within the catchment areas based on feedback of experience acquired with existing agri-environment-climate measures, analysis of obstacles to commitments, and modifications needing to be made and goals to be attained for effectively protecting the water resource. Areas for reflection and study are identified by an agricultural technical commission (made up of the Agence de l'Eau Seine-Normandie, the Chamber of Agriculture, farmers, the National Institute for Agricultural Research (INRA), and representatives of organic agriculture) and advisers in the area of livestock raising.

Contact

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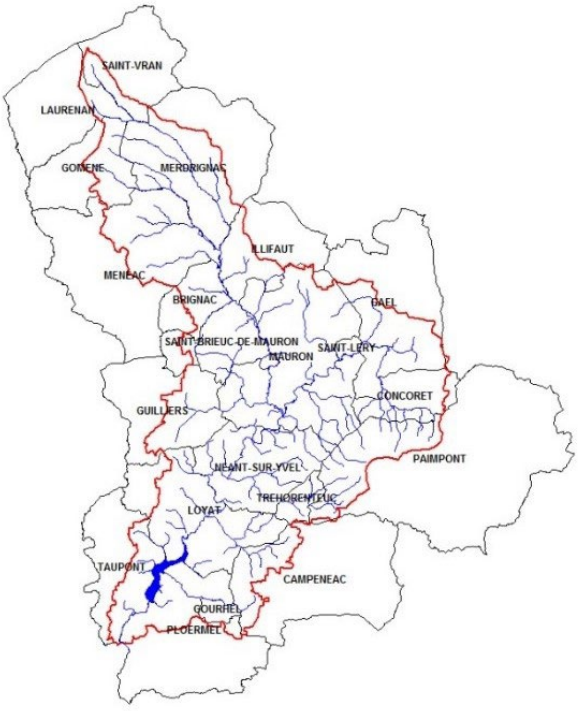
LAC AU DUC ET YVEL-HYVET CATCHMENT, FR

The CPES project has one pilot with six case study areas set up to investigate new payment mechanisms to increase environmental and societal benefits.

The catchment area of the river Yvel-Hyvet is part of the Grand Bassin de l'Oust's mission: to recover of the quality of water and the good ecological status of water bodies.

Located in France in the Brittany region, its outlet is the lake "**Lac au Duc**", where activities are controlled by the Regional Health Agency and the drinking water abstraction is managed by Eau du Morbihan.



Map of the Yvel-Hyvet catchment

Geographic Scope Report

The Lac au Duc was selected because it has a recurrent eutrophication problem. The Lac au Duc is an artificial lake with an area of 250 hectares, created in the 13th century by the Dukes of Brittany. It is fed by the river Yvel-Hyvet which has its source in Saint-Vran. The body of water is a drinking water source of 3.5 million cu. m. of water serving the north-east of Morbihan. During summer, Lac au Duc is also a tourist attraction and recreation pole thanks to its landscape and the nautical base of Taupont where many activities are practiced (sailing, water skiing, pedal boats, canoeing-kayaking, stand-up paddle ...) and leisure (hiking, fishing, hunting ...). A supervised beach welcomes many tourists in July and August. A campsite, restaurants, a hotel and a golf course are also on the banks of the lake. The communities of Taupont and Ploermel benefit from these touristic actions.

The main economic activity of the Yvel-Hyvet catchment (22 communes) is agriculture. Dairy production is dominant in the North and South of the catchment and intensive farming is mainly located in the West and in the Center. Industrial activities are concentrated around the main towns: Ploërmel, Mauron and Merdrignac. Height wastewater treatment plants have their discharges in the Yvel-Hyvet catchment area. One water purification plant is on the Lac au Duc.

Different regulations apply in the Lac au Duc area and the Yvel-Hyvet catchment area: the Water Framework Directive (WFD), the Law on Water and Aquatic Environments (France), the Grenelle Environnement (France), the Master Plan for Water Development and Management (SDAGE) of the Loire-Bretagne area and the Plan of Water Development and Management (SAGE) of the Vilaine catchment.

Thus, the stakeholders involved in various sectors are numerous on the Lac au Duc case-study, grouped under the themes «Water Management», «Leisure, Tourism, Associations», «Agriculture» and «Public Communities».

Examples of the problem with cyanobacteria blooms and the impacts on tourism

Le lac sous traitement contre les algues bleues

La baignade du Lac au Duc est interdite depuis presque trois semaines en raison de la trop forte présence de cyanobactéries. Le 4e traitement de l'année a été administré, hier matin.

Reportage

Ailes que le soleil ait encore timide dans le ciel en tout début de matinée hier, un petit bateau électrique rouge sur le Lac au Duc. Lentement, il fait des allers-retours dans une zone prévue pour la baignade et délimitée par des gros boudins rouges. Sur le bateau pneumatique, deux hommes sont en train de déverser du peroxyde d'hydrogène. « C'est de l'eau oxygénée, ce que beaucoup de personnes ont dans leur pharmacie et utilisent comme désinfectant », explique Vincent Gruffat, ingénieur chef de projet au sein d'Arcadis, société qui s'occupe du traitement.

Une nouvelle expérimentation

Cette eau oxygénée en très faible concentration permet de lutter contre les cyanobactéries. Plus couramment appelées algues bleues, ces bactéries présentes en trop grande quantité, empêchent la baignade selon les préconisations de l'Agence régionale de la santé. « L'avantage du peroxyde d'hydrogène, c'est qu'il permet de tuer les bactéries de manière sélective, sans nuire au reste de la flore », précise Vincent Gruffat, tout en glissant un œil sur le bateau.

À ses côtés, Alexandre Morin, assistante de direction au syndicat mixte du grand bassin de l'Ouest et Emilien Mineaud, ingénieur à d'études à l'université Rennes 1 qui collabore avec l'entreprise Acantis sur ce traitement. Tous veillent à ce que tous se passent bien, les yeux rivés vers la plage.

L'opération, réalisée hier, s'est faite en deux fois, le matin et l'après-midi. « Il y en a pour environ une heure à chaque fois », estime Emilien Mineaud. Ce traitement à base de peroxyde d'hydrogène a été testé au Pays-Bas et c'est la première fois qu'il est appliqué sur le lac au Duc. Taupont a donc été choisi, avec d'autres communes en France, pour être un des endroits de cette expérimentation. Ce projet de recherche fait partie d'un projet européen plus large nommé Interreg et qui se base sur trois sites en France et trois en Angleterre. « Le traitement est donc financé par l'Union européenne et pas par la communauté de communes », assure Alexandre Morin.

Les équipements du lac au Duc permettent de réaliser cette expérimentation. « Il aurait été très compliqué d'appliquer le traitement sur l'ensemble du lac mais comme la zone de baignade est délimitée par des boudins et par des sortes de bâches en dessous cela est bien plus pratique », affirme Vincent Gruffat.

Des explications ont été affichées près de la plage et des prospectus sont disponibles à la base nautique. Alexandre Morin le conçoit, « ce n'est pas évident à comprendre ».

Alicia ROUX.

Ce qu'il faut savoir sur les cyanobactéries

Les cyanobactéries, qu'est-ce que c'est ?

Sous ce nom un peu barbare, se cache en réalité une bactérie plus connue avec l'appellation d'algue bleue. Les cyanobactéries sont donc des micro-organismes de couleurs bleu vert présentes dans le monde entier. Elles contaminent le plus souvent des eaux calmes et riches en nutriments comme les lacs ou les rivières.

Comment repérer une eau contaminée ?

Lorsqu'il y a forte prolifération de cyanobactéries dans l'eau d'un lac, ces dernières forment des fleurs d'eau, aussi appelées blooms. Ces fleurs d'eau représentent une couche verte, parfois bleutée, à la surface de l'eau.

Est ce que c'est dangereux ?

Ce peut l'être lorsqu'il y a eu beaucoup de cyanobactéries et qu'elles produisent trop de toxines. L'année dernière, treize chiens avaient trouvé la mort sur les rives de la Loire et du Cher, après avoir bu ou s'être baignés dans les cours d'eau avec un fort taux de cyanobactéries. Chez les hommes, les cyanobactéries peuvent parfois provoquer des symptômes divers : irritation cutanée, crampes d'estomac, vomissements, nausée, diarrhée, fièvre, angine, céphalées, douleurs musculaires et articulaires, vésicules autour de la bouche ou encore atteinte hépatique, rapporte l'OMS. En revanche, les cas mortels sont extrêmement rares.

Des vacanciers compréhensifs

Fanny (à droite) et ses copines pique-niquent sur la plage à défaut de pouvoir se baigner.

« On venait ici pour pique-niquer et pour se baigner, » Fanny Renault et ses deux copines sont venues à la plage du lac au Duc sans savoir que la baignade était interdite. Avec leurs maillots de bain sous leurs vêtements, les trois copines sont un peu déçues. « Nous sommes allées voir les maîtres-nageurs, ils nous ont expliqué pourquoi c'était interdit du coup on comprend totalement, ce n'est pas grave », la jeune femme.

« On fait la police et on répond aux questions », explique Alexandre Salès, maître-nageur, le regard tourné vers la plage. « Généralement, les vacanciers sont très compréhensifs mais c'est plus compliqué avec les gens du coin qui en ont marre de ne pas pouvoir se baigner. » La plaisance, fermée à cause des travaux, n'aide pas les choses avec la période de fortes chaleurs de ces derniers jours.

A. R.

100 000 C'est le nombre de cyanobactéries par millilitre d'eau nécessaire pour que la baignade soit autorisée. Au premier traitement le 27 juin dernier, il y avait environ 1 million de cyanobactéries pour un millilitre, soit un chiffre dix fois supérieur aux normes recommandées.

State of the Environment

The **problem** of Lac au Duc is the eutrophication of the water body which caused recurrant cyanobacteria blooms during the summer season. Cyanobacterial development correlates to nutrient concentration with phosphates being the limiting nutriment, light availability and warm temperatures. Phosphates reach the lake via the various catchments that feed the water body, the largest of which is that of the River Yvel-Hyvet, which can be stocked in the sediments for decades.

The **sources** are therefore both diffuse via runoff and soil erosion, and punctual via sanitation, and release of phosphorus from the internal sediment load of the water body.

The **itinerary** of phosphorus the most important towards the water body is the river. Diffuse sources are transferred by surface runoff (runoff, erosion) and subsurface transport (outcrop exposure in lowland areas, artificial drainage). Point sources release phosphorus directly into streams at disposal points.

The **receptor** is the Lac au Duc where phosphorus causes eutrophication, resulting in cyanobacterial blooms. Because the Lac au Duc is a source for potable water, the phosphorus flows which are particularly high in the four sub-catchments of Yvel have led the authorities to classify the catchment within measure «3B1» of the SDAGE Loire-Bretagne : it creates an additional regulatory framework for the upstream catchment aiming to reduce the contributions and transfers of diffuse phosphorus upstream of priority water bodies because of drinkable water abstractions.

The **impact for the Lake** is the frequent ban by municipal by-laws of bathing in the summer period (July and August), the limitation of nautical activities and the prohibition of consumption of fish, in case of concentrations of cyanobacteria higher than the alert thresholds set by the Regional Health Agency. The tourist image of the area is impacted and thus the economy of leisure and tourism. Several curative actions were carried out by Ploërmel Community (copper sulphate, aeration, sediment capping with calcium carbonate). As part of the Interreg project, as a new method the use of hydrogen peroxide will be tested. **For the catchment**, the impact of the 3B1 classification is a constraining regulation for farmers. Preventive actions have been carried out for several years by the SMGBO (study about Phosphore, catchment programmes, AEM, Breizh Bocage programme, Aquatic areas programmes).

Contact

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