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# Governing research through affects: The case of ecosystem services science

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## Abstract

Despite the abundant literature on transformation of research and the affective dimension of research practice, affective governing of research has not been documented to the same extent. To address this gap, we examine how scientific research can be affectively governed by research institutions. We focus on the case of ecosystem services science, an interdisciplinary field of research expected to lead to decisions capable of halting environmental degradation. Drawing on theoretical discussions bridging the concept of affect and the Foucauldian concept of government, we argue that affects can be mobilised as a technology of government in governing scientific practice. We identify three affective techniques used to govern ecosystem service research and discuss the limits of governing research through affects. Our analysis deepens the understanding of how academic work is transformed in the context of redefined relations between science and society.

**Key words:** affect; emotion; ecosystem services; research government; research funding

## 1. Introduction

Increasing pressure to publish, short-term contracts and dwindling number of positions have changed scientists' working conditions, especially at early career stages. According to Loveday (2018), flexibility and precariousness have generated a feeling of collective anxiety leading to the formation of 'the enterprising academic subject'. In her view, anxiety is not just an individual experience but a collective affective condition imbuing research practices and driving individuals, for instance, to compete with one another. Fostering anxiety as a collective condition of research, she argues, has been a strategy to 'persuade, induce and incite academics to adjust their "conducts" in line with the objective of the [academic] sector'. Although many authors have discussed current transformations of research work (Morris and Rip 2006; Thèves et al. 2007; Jouvenet 2011; Gibbons et al. 1994) and pointed out the role of affects in scientific research practice (Barbalet 2002; Whitney 2013; Charvolin et al. 2013; Parker and Hackett 2014; Head and Harada 2017; Brunet 2018a), there is less research on the affective strategies of research and policy institutions to transform research. This article contributes to the sociology of science and emotion (Parker and Hackett 2014) by bringing together the two strands of research so far only little considered jointly: research on the affectivity of scientific practices and research on the government of science at an institutional level.

We examine how scientific research can be affectively governed by focusing on the case of ecosystem services (ES) science. The notion of ES designates the benefits human societies derive from the functioning of ecosystems. Gathering together ecologists, economists and social scientists, ES science defines, assesses, quantifies, maps, and values the services provided by ecosystems (Daily 1997). Information about the benefits people gain from nature is expected to convince those decision makers who are not particularly sensitive to nature or discourses about the need to protect it. ES science has been justified by its capacity to transform societal and economic decision making and help societies make sustainable choices (Brunet et al. 2018c). It provides a good case to study the affective dynamics of research because of its high policy relevance but also because it has generated a passionate debate among scientists (Barnaud and Antona 2014; Brunet 2018a). While part of the community of ecologists has been excited by the promise of the notion to halt the degradation of nature and reconcile nature conservation with economic development, many ecologists have become concerned with the proximity of the notion with neoliberal economic ideology and its compatibility with efforts to commodify nature (Arsel and Büscher 2012; Maris 2014; Brunet 2016, 2017).

Our focus is on how research and policy institutions mobilise affective strategies to transform research and generate a scientific movement around a conceptual innovation. Rooted in the 1970s utilitarian welfare economics, and later mainstreamed by American ecologists such as Daily (1997), the notion started to spread widely when adopted in the international political agenda (Gomez-Baggethun et al. 2010). In the 2000s, a United Nations (UN)-led

process was launched to create the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and assess the state of knowledge on biodiversity and ES. During the 2010s, a whole scientific field has emerged on the subject. Like nanotechnology (Bensaude-Vincent 2014) and resilience ecology (Parker and Hackett 2012), ES research has known a rapid success and buzz and has given rise to a scientific movement (Frickel and Gross 2005).

The fate of the notion enables to study the role of affects in governing a booming research field. We use the Foucauldian concept of government to examine how affective powers influence knowledge making in ES science. Literally, government designates 'ways of acting to affect the way in which individuals [and collectives] conduct themselves' (Burchell 1993). An analysis of government focuses on 'an array of technologies of government … in terms of strategies, techniques and procedures, through which different authorities seek to enact programmes of government in relation to the materials and forces at hand and the resistances and oppositions anticipated or encountered' (Rose 2013: 42). Following Anderson (2014) who has discussed the affective dimension of government, we consider affects as technologies of government and analyse their role in governing scientific practice.

Our empirical exploration into ES science suggests that various affective techniques can be used to govern research in institutional contexts. We start by presenting theoretical reflections about governing research, on the one hand, and affects in scientific activities, on the other hand, and examine how these theoretical perspectives can be combined. After exposing the research materials and analytical methods, we present three affective techniques mobilised to govern ecology and making ecologists join ES research. These techniques include famous ecologists and international institutions generating collective enthusiasm for the notion through hype and fame, funding institutions diffusing an opportunistic atmosphere surrounding ES research and promoters of the notion conducting emotional work to reassure reluctant colleagues to engage in ES research. We then present the challenges and limits of governing research through affects. Finally, we discuss the role of the affective techniques we identified in the creation of a new scientific movement in a time of unprecedented ecological crisis and of increasing precariousness of scientific workers.

## 2. Governing science through affects

Classically, science study scholars have documented mundane research practices but have somewhat neglected the role of macrostructures and dominant institutions (Gläser and Laudel 2016) and the general organisation of the research system (Whitley 2000). However, political sociology of science has bridged social studies of science and science policy studies (Blume 1974; Frickel and Moore 2005; Jouvenet 2011; Lamy 2015; Gläser and Laudel 2016; Pestre 2016). Jasanoff's (1990) famous concept of knowledge co-production illustrates well the simultaneous articulation of scientific ideas and the societal context in which they gain legitimacy (Rytteri et al. 2016).

Scholars studying the governing of science have documented the role of specific institutions: European research bodies (Cremonini et al. 2017; Himmelsbach 2017), funding agencies (Braun 1998; Thèves et al. 2007; Luukkonen 2013), and companies and foundations (Bloch and Sørensen 2014) in attempting to transform scientific practice. As 'the major channel through which authority over research content is exercised' (Gläser and Laudel 2016), funding has been one of the most studied aspects of research governing (Hackett 1987; Laudel 2006; Heinze 2008; Louvel and Hubert 2016). In his study of French nanotechnology laboratories, Jouvenet (2011) shows that project-based funding has changed the relationship between researchers and the structures within which they work, as well as their logics of action. The creation of research agencies, such as the National Research Agency (ANR) in France in 2005 (Gallié 2006; Jouvenet 2011), has accentuated the concentration of financial resources among few researchers (Cremonini et al. 2017) and transformed the previously trust-based research funding system into a performance-based one (Bloch and Sørensen 2014). These changes have taken place within a broader context of redefined contract between science and society (Gibbons et al. 1994) and decreasing public spending (Thèves et al. 2007; Jouvenet 2011). When research is governed through a market approach (Hackett 1987), individual performance is assessed through various evaluation systems (Richard and Gläser 2007).

Such mechanisms of assessing and performing have been captured by philosopher Michel Foucault. Following his approach, the practice of governing has been examined by identifying how specific forms of power influence knowledge production. 'The exercise of power perpetually creates knowledge, and, conversely, knowledge constantly induces effects on power' (Foucault 1980: 52). Designating 'the conduct of conducts', government represents an 'art, way of doing things for acting on the actions of individuals, taken either singly or collectively, so as to shape, guide, correct and modify the ways in which they conduct themselves' (Burchell 1993). The Foucauldian perspective urges to investigate what specifically is governed, by whom, through what means, and with what consequences. It invites to focus on the strategies and techniques used in governing research.

Furthermore, the idea to study practices of governing in terms of affects has been put forward by scholars criticising the relationship between affects and capitalistic intervention. For instance, Hochschild (1983) depicts how flight workers and tax collectors perform emotional work manipulating their own affects to induce a given emotional experience for their clients. She shows that emotions and affects are social products, engineered according to social norms and power relationships, rather than personal psychological properties. Although Foucault did not discuss affects explicitly, he emphasised that power operates affectively, through subordination and coercion as well as desire and seduction. Inspired by this, Anderson (2014) documents how various techniques are deployed to intervene in affective life and how they target, assess, and manage affects. Understanding affect as an object-target of and condition for power invites to analyse it as a technology of government which can enact or strengthen specific political programmes as well as subvert and challenge them. For instance, affects can encourage individuals to accept particular policies (see Brunet (2018b) for the role of hope and happiness in nature conservation). Yet, Anderson (2014) maintains that attempts to intervene in affective life may not always lead to desired outcomes.

The role of affects in governing research has been addressed by some authors (see the review by Parker and Hackett 2014), including early sociologists of science. Fleck ([1935]/1981) described how scientific thought collectives could be governed by collective feeling styles. In turn, Merton ([1938]/1970) argued that scientists develop an emotional commitment to norms governing research, such as universalism, communism, disinterestedness, and organised skepticism. Some contemporary scholars have especially studied the emotional aspects of research evaluation. Lamont (2009) details the emotional management needed for successful peer review panels. Bloch (2002) notes that the evaluation and reception of academic work can affect scientists who either feel pride when their accomplishments are

acknowledged, or shame due to negative peer review. Other scholars have pursued the analysis initiated by Fleck on the affective government of collective work. Parker and Hackett (2012) discuss affective strategies conducted by scientists to develop a scientific and intellectual social movement (see also Parker and Corte (2017)). They describe how the Resilience Alliance developed a specific emotional culture by organising meetings in remote locations and getting energised by the charisma of individuals such as C. S. Holling. Their work underlines the importance of emotional energy arising from collaboration to generate confidence and enthusiasm and foster creativity of scientific groups (Collins 2004). This article contributes to this literature by documenting the role of affects in governing ecologists and urging them to join the new field of ES research. Our approach enriches previous works by examining how research and policy institutions seek to govern research affectively.

## 3. Research material and analysis

Between 2014 and 2016, we conducted in-depth interviews with fifty-one scientists involved in ES research to various extents. They were PhD students or postdoctoral researchers (seven), intermediate career researchers (six), and senior researchers including leaders of teams, labs, or research institutions (thirty-eight). The majority of informants was only partially or had only recently become interested in the subject whereas nine of them had published more than ten articles about ES and can be considered forerunners or specialists dedicated to the notion. Twelve had never published an article in an international journal explicitly mentioning the ES notion in the title, keywords or abstract by March 2016. Several reasons explain the absence of publication on ES. Some interviewees had not been working on ES long enough to publish, while others had not published in English or had published only grey literature. Some were not interested in publishing on ES at all. Twenty-nine informants had published about ES, but fewer than ten articles. This reflects the booming phase of ES science: many are interested in it and starting research, and the field is gradually maturing. The majority of the informants were ecologists (twenty-nine) and economists (twelve) but we also interviewed geographers (four), agronomists (two), conservation biologists (two), as well as one researcher in environmental management, and one political scientist. They came mostly from France (forty), but also from other European countries: Finland (five), the Netherlands (two), Norway (one), the UK (one), Sweden (one), and the USA (one). We asked the informants about their first encounters and experiences with ES, how these changed their ways of thinking and working, and their appreciation of this experience. The recorded and transcribed interviews lasted from one to two hours and were mostly carried out at the informants' work place.

In addition to the interviews, we analysed the efforts of a French research centre to boost research on ES. The French National Research Institute of Science and Technology for Environment and Agriculture (Irstea) is a public research centre dealing with environmental issues and proposing research-based solutions for management and decision-making. Irstea has nine offices in France, hiring some 1,500 contractual and permanent employees. It conducts research on sustainable management of mostly rural and peri-urban areas, the prevention of natural hazards and biodiversity conservation. The theme of ES was selected by the French Ministries of Research and Agriculture to be one of the strategic themes in the contract between the State and the institute for the 2014–8 period. It offers us a possibility to explore the role of affective governing in implementing a scientific strategy at an organisational level.

We followed a two-day workshop organised by three scientists from the institute: the scientific director of a department focusing on terrestrial ecosystems from ecological and social scientific standpoints, and the scientific directors of the research units working on terrestrial and aquatic ecosystems. The organisers considered the workshop to be the most appropriate research management tool to incite researchers to work on ES and promote the turn to ES. They presented it as an opportunity to ponder new research questions and an occasion to discuss the state of the art with scientists from the whole institute. We conducted interviews with the promoters of ES, attended the workshop gathering scientists with various disciplinary backgrounds, and observed two one-day follow-up meetings and one three-day annual meeting of the terrestrial research unit. During the meetings, we took notes on the efforts performed by speakers to convince the participants to join ES research, the reactions of the participants and their discussions in working groups drafting new research projects. We paid particular attention to the embodiment of ES research governing and noted voice tone, speech speed, hesitations, and gestures. The two-day workshop was entirely videotaped. Facing the participants, the camera made it possible to follow individual reactions as well as the general response of the audience. In addition, we collected various documents about ES genealogy and research funding at the European level on the website of the European Commission.

Both observation and interview materials were analysed by following an inductive approach to data analysis inspired by grounded theory (Strauss and Corbin 1990). Our approach to affects focuses on how, by whom and with what effects affective practices are performed. Instead of opposing affect, often defined as bodily impulses, and emotions that are the subjective interpretations of those impulses, we follow a 'pragmatic-contextual' distinction (Anderson 2014) that avoids reenacting the dualism between mind and body (for a criticism of this opposition, see (Wetherell, 2012)). We understand affect in its generic sense, as a 'unitary category' (Anderson 2014: 12) to 'attend to different types of emotional experiences' (ibid.), including emotion, affect, and feeling. Affect is a force and energy that circulates and mediates within and between bodies and the world (ibid.). Instead of the psychological and personal dimension of affective life, this interpretation leads us to study collective affective processes, which can be shared between people (sometimes even if they have never met) and influence their conduct. Affects can, for instance, take the shape of affective atmospheres, evanescent conditions that 'envelop and emanate from particular ensembles that are gathered together for different durations around particular bodies' (Anderson 2014: 161) or other types of collective feelings that structure human conduct (Anderson 2014: 130).

To analyse our material, we used affect as a sensitising concept to code narratives, embodiments, and experiences. We started by coding affects when they were explicitly ('*I fear*', '*it seems dangerous to me*') or implicitly ('*that's a revolution!*' showing excitement) expressed through words or shown through gestures, hesitation, speech speed, and body positions (Flam and Kleres 2015). To overcome the challenge of subjective interpretation of emotions, we applied a collective interpretation method and compared our respective perceptions of the situations examined. Because we were interested in the role of affects in governing research, we included a second step of interpretation to identify which practices, developments or issues the affects were linked with. This was crucial to getting a picture of the affects as situated and contextual, implied by the events, circumstances and situations in which the individuals were involved, and enabled us to identify the three affective techniques involved in governing ES

research, showing how research institutions work affectively and prepare ground for scientific transformation.

## 4. Three affective techniques in governing ES research

### 4.1 Famous ecologists and international institutions triggering collective enthusiasm and hype

The first technique of governing research consists in a small group of ecologists in association with international institutions promoting the adoption of the ES notion and its framing of conservation and ecological issues among the community of ecologists. This group sought to render the ES notion credible and legitimate through fame, hype and excitement by publishing international reports and spreading the promises of the notion.

In 1997, Gretchen Daily and Robert Costanza, former students of the famous ecologists Paul Ehrlich and Howard T. Odum, released two seminal publications on ES (Daily 1997; Costanza et al. 1997). One year later, Robert Watson and a group of scientists published, in association with the United Nations Environment Program (UNEP), the US National Aeronautics and Space Administration (NASA) and the World Bank, a pre-study preparing an international evaluation of ecosystems: 'Protecting our Planet, Securing our Future. Linkages Among Global Environmental Issues and Human Needs' (see Pesche 2011; Castro and de Sartre 2014). The same year, Walter Reid, then vice-president of the World Resources Institute (WRI), supported the idea of conducting a global assessment of ecosystems and their services with UNEP, United Nation Development Program and World Bank. He chaired a 'Pilot Analysis of Global Ecosystems' funded by the UN, the Global Environmental Facility and the Packard Foundation and published, in 2001, a document launching the Millennium Ecosystem Assessment (MA). The MA was supported by Kofi Annan, the then general secretary of the UN, and UN conventions (on biological diversity, climate change, desertification, wetlands, and migratory species), as well as by several international institutions, such as the International Council for science, the Consultative Group for International Agricultural Research, the World Business Council for Sustainable Development and the International Union for Conservation of Nature (IUCN).

Funded by the Summit Foundation, the Wallace Global Foundation, the Global Environmental Facility, the United Nations Foundation, the Rockefeller Foundation, the Packard Foundation, the World Bank, and the UNEP, the MA was published by the UNEP in 2005, after four years of collective work involving over 1,360 scientists. Famous scientists involved in prestigious universities and international institutions of environmental governance, such as Robert Watson, A. H. Zakri, Walter Reid, Harold Mooney, Paul Ehrlich, and Gretchen Daily, authored and reviewed the report. The number and reputation of the international institutions and scholars involved lent legitimacy and credibility to the results of the MA, turning it into a founding document of ES research. In addition, the diversity and multiple geographic origins of contributing scientists helped to disseminate ES research rapidly and widely among the international research community interested in nature conservation. The results of the report generated major attention, as the report concluded that more than 60 per cent of ES are degraded and that this degradation has mostly taken place over the last 50 years (Millennium Ecosystem Assessment 2005). Following the publication of the MA, the European Commission started to use the notion of ES and introduced the term next to that of biodiversity. Simultaneously, a report led by Nicholas Stern on the costs of mitigating climate change was commanded by Tony Blair after a G8 summit. The idea was copied in ES research, and in 2007, Angela Merkel announced the preparation of The Economics of Ecosystems and Biodiversity (TEEB) report at the G8 summit in Potsdam, quickly joined by the European Commission and the UNEP. The TEEB (2008) report pursued the approach of the MA and underlined the negative economic consequences of the degradation of ES.

In France, nine scientists were involved in the MA but only two of them (Jacques Weber and Sandra Lavorel) contributed actively to the dissemination of the notion (Pesche 2011). Despite attempts to promote it, the notion remained marginal in research on ecology and nature conservation. After the MA, the ministry of ecology tried to make up for lost time and ordered a report on the possibility to conduct an MA in France. The following years, the publication of two national reports on the relationships between farming and biodiversity and on the economic methods available to value biodiversity and ES (Centre d'analyse stratégique (CAS) 2009) helped legitimate and foster ES research. Simultaneously, scientists involved in IMoSEB, an institution that prepared the creation of IPBES (Granjou et al. 2013), started to promote the ES notion. One of these scientists acknowledged the importance of international processes to render ES research credible and exciting on a national level.

> This notion (ES) is very helpful because it underlines human dependence on nature. For me, that's a revolution! I am starting to get old and I knew a time when talking about limits was forbidden. There were supposedly no limits to human development, thanks to the infinite human capacity of innovation. Those daring to say otherwise were considered old-fashioned. So it was a relief to see the notion being defended at the international level. (Senior ecologist, director of a large French ecology lab, #1)

Following the publication of the MA, during 2005–11, the proportion of articles referring to ES in international ecological journals was multiplied by eight (Castro and de Sartre 2014: 77). This drastic increase shows how effective the MA was in triggering excitement. It helped the notion become a buzzword (Bensaude-Vincent 2014) and generated a huge amount of enthusiasm among the community working on environmental issues. Almost all our informants acknowledged ES as 'trendy' or 'popular', or 'buzzing' and that the MA has played a key role in their discovery of and engagement with the notion. During the few years following its release, ES also became a keyword for scientists aspiring to publish in high impact journals. Its novelty helped to gain recognition and get papers accepted more easily. In 2012, Elsevier launched the journal *Ecosystem Services* that further reinforced the trend and helped maintain the hype. Many ES scientists admitted to have been fascinated by the rapid spreading of the notion, fueling their excitement about it and strengthening their commitment to using it:

> I was surprised by the explosion of the paradigm! I made a break in this domain of research in 2000 and started to go back to it in 2006. And WOW! I just wanted to refresh my references, and it was just impossible! The number of publications had … It was exponential! From 2000 to 2005, Bang! It exploded!. (Senior economist, #2)

When zooming at Irstea, we can trace the influence of the collective excitement as ecologists responded to the trend. An organiser of the ES workshop we attended acknowledged that he started to work on the notion because:

> There was a buzz simultaneously in the literature, in European research projects, in several national administrations following the publication of MA and TEEB, and in the European research network ALTER-Net. (Senior ecologist, #3)

In addition to being governed by international institutions and reports, the buzz was fueled by the promises to reconcile ecology with economics by building consensual positions between nature conservation and economic development. Similarly to the concept of 'sustainable development' (Bensaude-Vincent 2014), the notion attempted to pacify relationships between two different worlds: economics and ecology, as hinted by the combination of ecological (ecosystem) and economic (service) terms. The researcher quoted above testified for the appeal of the notion which fostered collective enthusiasm:

> I have a huge ambition for the notion because it enables to interface ecology and the state of ecosystems with the functioning of society. It offers a framework for different disciplines such as economy, ecology and sociology. (Senior ecologist, #3)

His enthusiasm was shared by a workshop participant, a senior ecologist who considered the notion to be 'the Graal of ecological sciences'. During the car trip to the workshop, he explained that he was especially excited by the promise of the notion to bring together various scientists and address societal issues. Fostering the commitment of ecologists to a new domain of research was therefore achieved both by triggering collective excitement (see also Parker and Hackett (2012)) and by involving high profile researchers (Lamont 2009). Our observations from ES science complement the previous works by showing that research can be affectively governed by institutional strategies (involvement of famous ecologists, association with international institutions, publication of international reports) generating hype and excitement.

### 4.2 Funding institutions enacting an opportunistic atmosphere

Opportunism designates the ability to use situations and occasions for one's purpose. The second technique to support scientific transformation in ES science concerns funding and other institutions (networks and journals) creating and maintaining an opportunistic atmosphere to incite the community of ecologists to adopt the ES notion.

Like other research fields (Jouvenet 2011; Gläser and Laudel 2016), ES science has increasingly rested on project-based funding. In Europe, its adoption has been especially facilitated by the research funding of the European Commission. Aiming to 'coordinate European research on biodiversity and ES' (Lemaitre and Le Roux 2015: 5), the BiodivERsA network connects different funding agencies in biodiversity research. It involved thirty-two funding agencies from twenty-one European countries in 2016. From 2008 to 2015, it allocated almost 80 million euros to research projects through six calls. Table 1 presents the successive BiodivERsA calls and the number of ES projects funded. Although ES funding preceded BiodivERsA (e.g. EU FP5), BiodivERsA has significantly increased the amount of funding allocated to ES science. In addition, the European Commission has launched seven calls for projects explicitly targeting ES and many projects funded by the EU Framework Program have mentioned ES in their summary. In total, we found forty-eight FP7 projects[1] focusing on ES with varying degrees (Table 2), representing a budget of 303 million euros from 2007 to 2013, that is, 16 per cent of the total budget of FP7 Environment research programmes.

Funding institutions have enveloped the concept with an atmosphere of opportunism. By seizing the notion, researchers could expect to have easier access to funding:

> I started to use the notion around 2008–2010 to respond to a call for proposal. Clearly, it was an opportunity. It was necessary to put a few keywords and one of them was ES. I started to use the ES notion simply like using another word for the same thing. I was working on productivity, but I wasn't calling it productivity anymore, but ES. (Senior ecologist, #4)

. . . and to positions:

**Table 1.** Call for proposals of BiodivERsA and research projects funded on ES.

| Call year | Theme | ES projects | Funding (in millions of euros) |
|---|---|---|---|
| 2008 | Biodiversity: linking scientific advancement to policy and practice | VITAL | €14.2M for twelve projects |
| 2010 | Biodiversity and ecosystem services(1) Relationships between biodiversity and ecosystem services(2) Valuation of biodiversity and ecosystem services (monetary and non-monetary), and better incorporation of biodiversity and ecosystem services into society and policy | APPEAL, CONNECT, FarmLand, INVALUABLE, SCIN, SmallFOREST, URBES | €9.5M for seven projects |
| 2011 | Biodiversity dynamics: developing scenarios, identifying tipping points and improving resilience | BUFFER, CoForTips, EC21C, TIPPINGPOND, LIMNOTIP, REGARDS, SIGNAL, TipTree | Between €6M and €8M for nine projects |
| 2012 | Invasive species and biological invasions | None | €8.9M for nine projects |
| 2013 | Promoting synergies and reducing trade-offs between food supply, agriculture and ecosystem services | Basil, CP$^3$, ECODEAL, EcoFruit, ECO-SERVE, PromESSinG, STACCATO, TALE, VineDivers | €10.3M for ten projects |
| 2015 | Understanding and managing biodiversity dynamics to improve ecosystem functioning and delivery of ecosystem services in a global change context: the cases of (i) soils and sediments, and (ii) land-, river- and sea-scapes (habitat connectivity, green and blue infrastructures and naturing cities) | At least:BIOINVENT, Digging-deeper, REPEAT, SOILCLIM, SoilForEurope, SoilMan, URBANMYCOSERVE, BearConnect, BIOGEA, BIOVEINS, CROSSLINK, FUNgreen, GreenFutureForest, IMAGINE, Oscar, RESERVEBENEFIT, SPONFOREST, URBANGAÏA, WOODNET | €33M for twenty-six projects, jointly launched with European Commission |

**Table 2.** Number of projects funded by FP7 (2007–13) with an explicit focus on ES.[a]

| Number of projects where the ES notion seems central | Total number of projects where the notion is mentioned in title, description or keywords | Time range of the projects | EU contribution for all the projects in euros | Total budget of the projects in euros |
|---|---|---|---|---|
| twenty-six | forty-eight | 2008–17 | 2,300,908,751 | 30,300,581,007 |

[a]This table was made in 2016. We focused only on projects funded by FP7 during 2007–13 and excluded Biodiversa from the list. The information on the research project is available here <http://cordis.europa.eu/> accessed 12 Jul 2019.

> Post-docs are often funded by European projects. It is very expensive to pay a post-doc during three years! The [European FP7] project made this possible. (Post-doc in physical geography working in a team of ecologists, #5)

A sense of potential and possibility to get funded, especially valuable in precarious times, reinforced the opportunistic atmosphere surrounding the notion:

> Calls for proposals are really pushing people to change how they formulate questions. Even if people still work on the same thing, they articulate it in a way that is more likely to be funded. (Senior ecologist, #6)

This opportunistic atmosphere was also mobilised in specific situations, such as the Irstea workshop where researchers discussed strategies and elaborated projects to access funding of two BiodivERsA calls and three H2020 calls. Increasing dependence on project-based funding and decreasing direct public funding clearly raised interest among workshop participants who, in majority, had never published on ES before. During informal conversations over the workshop they expressed their interest in new funding opportunities offered by the notion. Two researchers who had hardly touched upon the notion earlier presented ideas for research projects on ES. The use of the notion intensified their hope to obtain resources and keep doing their research on soils and ecological corridors. Later on, an established ES researcher highlighted institutional opportunities to the participants. Her whole presentation focused on international networks and projects to which researchers could contribute by working on ES. The participants seemed much interested in these networks and several asked for more details about them and their related projects. In the interviews, various ecologists acknowledged that they had used the notion to join or develop their own international networks. One ecologist admitted that the notion had enabled him 'to participate in and lead a number of large international projects' (senior ecologist, #7).

For a famous Swedish ecologist:

> the most influential thing was that I got involved in an EU project on pollination. I collaborated with a lot of people because of the notion. I did a meta-analysis with 57 other really good scientists. It was a lot of fun and at the same time it's horrible, having so many people to communicate with, especially on a slightly controversial topic! But it was also a lot of fun, you build up a really big network. That's probably something I would not have done otherwise. (Senior ecologist, #8)

The funding, networking and career opportunities offered by ES research especially reassures young scientists who can feel they belong to a community of researchers endowed with its own institutions:

> There are definitions, a conceptual framework, the MA, an international organisation (IPBES), lots of European projects. This whole structure helps you to know where you are in academia. The ES notion is an umbrella for researchers. (Post-doc in physical geography, #5)

In times characterised by increasing precariousness, funding institutions govern science indirectly by raising the sense of potential and possibility to conduct and develop research work (Parker and Hackett 2014). In addition, research networks reinforce the feeling of possibility by circulating and spreading the interest in and attraction for the notion.

### 4.3 Promoters of the concept conducting emotional work to soothe their colleagues' fears

Despite the collective hype and atmosphere of opportunism, the ecological community is polarised and many ecologists are still anxious and afraid of the ES notion. The debate about the notion has been heated and critical remarks have been put forward especially by those who are concerned over the neoliberal implications of the approach (Arsel and Büscher 2012) or the changes it brings to nature conservation (Maris 2014). Therefore, promoters of the ES notion need to reassure their colleagues in many practical situations to dissipate fears. These attempts constitute a third affective technique to govern research in institutional contexts.

At Irstea, the promoters of the notion identified the sources of criticism towards the notion prior to the workshop. According to them, some Irstea researchers considered the notion to be utilitarian and anthropocentric, and supporting the commodification of nature, or they were afraid of unequal partnerships with economists. A research manager explained his strategy to reassure his colleagues and encourage them to embark on ES science:

> I present the notion to the ecologists from the perspective of biodiversity … Especially with forest ecologists, I explain that the concept will enable them to develop partnerships with social scientists as well and not only with economists. We adapt our discourse. (Research manager, #9)

During the workshop, promoters of the notion performed emotional work to dissipate distrust and suspicion among their colleagues. The first speaker underlined the proximity between the notions of biodiversity and ES, demonstrating continuity with earlier research. In addition, he explained that also biodiversity is utilitarian and anthropocentric in practice, especially when scientists and nature managers are determining how many species are needed by human societies. Raising the sense of proximity between the two concepts enabled him to argue that the ES notion was not new but rather had an ancient origin, possibly dating back to Antiquity and Plato's writings. The joke about the possible ancient origin of the notion triggered laughs among the participants. Replaced by amusement, fear and anxiety around the notion were momentarily soothed down.

Several speakers acknowledged the limits of and critical perspectives to the notion to address the concerns of the participants but also to raise their interest. The speakers wanted to distance themselves from

controversial approaches to ES and avoid looking naive or over-enthusiastic. Instead, they invited the participants to improve the rigor and precision of ES research. When they presented ES maps and diagrams, for instance, they acknowledged that these tools were stimulating but oversimplified and had to be used cautiously. Economic valuation of ecosystems has been one of the most controversial topics around ES research, often thought as leading to commodification of nature (Arsel and Büscher 2012; Maris 2014). Yet, we observed some researchers using the fear of selling out nature to invite ecologists to engage in ES research:

> To convince ecologists, we explain that we should not leave economists decide alone what is expensive, what has value and what has not. We have to be there and decide where economic valuation should stop. (Senior ecologist, #10)

During the workshop, an economist made a presentation about biodiversity valuation without mentioning the notion of ES. This omission enabled him to prove that economic approaches are not reserved to ES. A different strategy was used by another ES promoter. He showed that ES can be apprehended as public goods requiring a cooperative system of exploitation and not only as components of market economy. After the first presentations, the participants engaged into turbulent debates about the notion. The speakers dissipated the debates by acknowledging the critical points and offering to turn them into research questions. Progressively, the participants stopped asking controversial questions about ES research and the initially heated atmosphere calmed down. Instead, participants started to request explanations about the projects presented by the speakers with a much more relaxed voice tone. On the second day, a collective group even worked on the subject of ES valuation and proposed to develop research projects associating monetary and non-monetary ES valuation methods. As demonstrated by previous studies on the role of affects in the formation of scientific movements (Parker and Hackett 2012; Parker and Corte 2017), also the examples from our analysis show the need to overcome fears and anxieties, especially in interdisciplinary partnerships.

## 5. The challenges of and limits to governing research affectively

Despite these affective techniques to govern ecological research, not all ecologists have adopted the ES notion or developed research projects on it. In fact, many have started to target their criticism at the collective enthusiasm and hype that have urged ES research. Having already experienced several consecutive buzzwords, especially senior ecologists have been irritated by the new collective enthusiasm. In their view, the notion homogenises research and threatens the development of other approaches.

> At one point, I could not stand hearing the phrase 'Ecosystems and their services' in European meetings any more. I kept hearing that. This misuse of language, this reiteration, this kind of stonewalling were becoming unbearable. (Senior ecologist, #11)

The critics considered that the notion has been adopted without sufficient scrutiny and that questions concerning the relevance and adequacy of the approach have been set aside.

> The ES notion is so trendy and things have gone forward so fast that everyone has taken up the ES notion and tried to define it from their own perspective instead of cleaning up the whole table and starting to think about what's wrong here in this world and how to create a new society and socio-ecological research. (Senior ecologist and research programme coordinator, #12)

Along the buzz, the notion seems to reflect everyone's interests. It has lost its specificity, to the point that some ecologists named it 'a trash notion'. Others were irritated by the institutionalisation of ES research as a scientific field, generating an 'academic bubble'. ES researchers were also reproached for adopting the notion because it was trendy instead of being really concerned over nature conservation. Some expressed that their initial excitement about ES had been replaced by annoyance and fatigue:

> I am tired of this. I don't see ecological research in that manner, and even less nature conservation: generating gnosis around a concept that produces concepts and agitation. The notion of ES tends to tire someone who has worked on it for over ten years. I think it's the same for one of my colleagues, who started to get bored by this work. (Senior ecologist, #13)

The opportunistic atmosphere generated by funding institutions to govern research was also disapproved. Some informants felt compelled to use the notion and may consequently have been affected by a sense of limited possibilities.

> Quite a few people were frustrated, they told me: 'Well I am pissed off, why do I always have to put ES? I am fed up, I am doing functional ecology and that's it!.' (Senior ecologist, #4)

Stable conditions, rather than the rapid development around the buzzword and precarious funding, were considered necessary for striving research:

> How do you actually take the time and peace needed for research? I would like to see at least some researchers at [my institute] in really peaceful conditions. Especially when funding is uncertain, you are so sensitive to such pressure that you will end up doing something else than what you are best skilled to do, or what you are most interested in. (Senior ecologist and research programme coordinator, #12)

Some ES researchers had simply renamed their earlier research as ES research to improve their chances to get funded:

> There was a lot of coating ("enrobage" in French). We realised that when we were reviewing the study on nature values. Some project titles were casting favourable light on the projects. And then, in the description, we did not find ES up to what was proclaimed before in the title. (Research manager from a research funding institution, #13)

This led informants to point out the 'dishonesty' of research management institutions and level criticism towards them as they failed to encourage innovative and risky scientific questions. Governing research through an opportunistic atmosphere was thus presented as opposed to the need for autonomy and meaningfulness in research.

> There is a problem of culture: science is highly managed. People say "improve my candles" and develop research programs at the ANR [French research agency] to direct us. H2020 at the European level is even worse! But we need to invent the electric light bulb and we won't invent it by improving candles! One needs to trust the scientific process to come up with new concepts. If you drive the scientific process, you are locking people up in a given number of questions. And you risk missing the intellectual evolution that will make the right knowledge or answer emerge. (Senior ecologist, #1)

Towards the end of the Irstea workshop, the interested atmosphere generated during the first day started to vanish. The participants

were divided into working groups to draft research questions for future projects, but only the scientists already committed to the notion really discussed in an energised mood. Others were rather disinterested or even ironic about the notion: 'We don't have to discuss ES in this group [on conservation and multiple uses]' said one ecologist. His group members answered, still ironically: 'We are not discussing the notion anywhere, have you noticed?!' They hardly discussed about the notion nor were enthusiastic about discussing alternatives to it. In this same working group, some participants started to worry about the potentially perverse side effects of the ES approach on biodiversity conservation, all the more that the promoters of the ES approach were not there anymore to reassure them.

During the last workshop session devoted to elaborating answers to specific funding calls, only a limited number of researchers manifested interest in the proposed projects. Many participants had already left the workshop, and those who remained seemed bored and exhausted, and were either working on their computers or looking at their watch. After the workshop, we learned that only one joint project, elaborated by an economist and an ecologist, had been submitted. The general atmosphere of the workshop had evolved from an initial interest to disinterest and boredom, which can be defined as a perceived loss of meaning and protest against this loss (Johnsen 2016). Once the face-to-face interactions between promoters of the notion and the participants stopped, the emotional energy and solidarity needed to aggregate the group (Collins 2004) dissipated. While reactions of researchers might take time to develop and could not be fully accounted for by observing the workshop, it appeared that the attempt to govern research through emotional work had limited effect on the researchers' engagement.

## 6. Discussion and concluding remarks

Our analysis of the emerging ES research field demonstrates that research institutions may operate affectively, in addition to more direct means to govern research. It features three affective techniques through which research institutions facilitated or boosted transformation of ecological research. First, the fame and prestige of international policy institutions raised collective affects of hope and promise, creating hype around ES and making ES research seem credible and exciting. Secondly, funding institutions and research networks induced an opportunistic atmosphere that could be mobilised in concrete settings, such as the Irstea workshop aiming at promoting ES science. Thirdly, in these concrete settings, promoters of the notion conducted emotional work deliberately to reassure researchers who were critical towards the ES approach. Previous works have documented how peer review (Bloch 2002) works affectively or how scientific movements organise affectively (Parker and Hackett 2012). Our results show that also policy institutions, research funding bodies and dedicated promoters and organisations employ affective strategies or work affectively when governing research.

The three techniques of governing science presented in our analysis encourage individual researchers to comply with research institutions' goals and norms. They shape the ways in which individuals and collectives of researchers feel and conduct themselves by mobilising alternatively seductive and coercive powers (Foucault 1980). Research funding, for instance, attracts researchers to ES research but also urges them to use the ES notion, thus making it an obligatory passage point to conduct ecological research. However, governing science through affects is difficult and always remains uncertain. For instance, the Irstea workshop shows a persisting tension between institutional demands to conduct ES research and the researchers' taste for autonomy.

The difficulty to govern research in affective terms follows from the tendency of the affective techniques to celebrate given affective states among researchers and value specific ways of conducting oneself, while marginalising others. For instance, creating an opportunistic atmosphere relies on the assumption that individuals are willing to follow trends, or to get excited about them, and hence are likely to look for and seize opportunities. By so doing, it shapes an ideal affective profile of the researcher, ready to adapt to precarious conditions instead of rejecting and refusing to endure them. In turn, reassuring strategies attempt to target weary researchers who are concerned over the risks of misuse of scientific research and willing to defend their autonomy. These profiles may induce emotive reactions among the researchers and illustrate their emotional commitments to a specific scientific ethos (Merton [1938]/1970; Parker and Hackett 2014). The attempt to create hype and excitement about a new notion exacerbates the sense of loss of meaning for some scientists. The creation of an opportunistic atmosphere may be criticised as it seems to narrow the opportunities and freedom of research and hence its creativity. Emotional work may lose its power as the targeted individuals become aware of and do not align with the attempts to manipulate their feelings towards ES.

Our analysis of ES research from an affective perspective furthers the understanding of the intricate role of the government of research by science and policy institutions in the formation of a scientific speciality. It complements studies on scientific and intellectual movements (Frickel and Gross 2005) by describing how a scientific speciality can spread from a core group of individuals including high profile researchers (Parker and Corte 2017) to a larger community of researchers. It shows that the formation of a new scientific movement requires various affective techniques to attract researchers and overcome their fears and doubts. The core group of ES researchers tried to dissipate their colleagues' emotional resistance and enhance their emotional commitment by working with international institutions and research funding agencies. This demonstrates that a scientific speciality cannot only form from bottom-up initiatives but also needs top-down governance.

The collective excitement for ES research has been facilitated by the 'interpretative flexibility' (Bensaude-Vincent 2014) of the notion which could be adapted to a variety of subjects and situations. Yet, many ES scientists reported that the buzz and hype for the notion are currently fading and that the notion is being replaced by others, such as that of nature-based solutions. ES thus seems to follow the same process of conceptual innovation (Meadowcroft and Fiorino 2017) than many other environmental notions and may reach the end of its fashion cycle. The case of ES suggests that excitement over a trendy notion cannot be eternally sustained. Because hype and buzz are evanescent and bound to fade, achieving long-term changes by governing research through excitement and hype may be challenging and comes at a cost. The recurring creation of new notions might indeed both fight boredom by offering new ways of articulating old issues, and reinforce it, especially for late career researchers having witnessed the successive arrival of a number of them.

The case of ES science enabled us to document the influence of affective governing strategies on the recent development of ecological sciences. We shed light on how scientists react to changing conditions in research (see also Morris and Rip (2006)) and how their attention can shift from one scientific notion (biodiversity) to another (ES). The case confirms some ongoing broader trends in

research (Jouvenet 2011; Gibbons et al. 1994), for instance, increased competition for not only recognition but also for the opportunity to continue research (Gläser and Laudel 2016). It also shows the limits and difficulties of governing research. Some researchers insisted on the importance of experiencing freedom and a feeling of security to be able to take risks and develop higher impact research instead of changing research marginally or conducting mainstream research. In addition, governing research through affective techniques may have perverse effects on scientific work. While some scientists really worked on expanding ES research, others used the notion in an opportunistic manner to develop their own research topics without developing ES science.

Attempts to govern research affectively should neither be overnor underrated. They do contribute to turning notions such as that of ES into booming scientific fields. They favour some affective profiles over others by energising part of the researchers and leaving others indifferent or even hostile. In an era of increasing precariousness and calls for productivity of scientific work, triggering enthusiasm and hype and creating an opportunistic atmosphere tend to become major affective techniques for institutions governing scientific research. This tends to encourage a rapid turnover of the centre-stage notions that soon become 'boring', which might hinder the construction of a stable research community. The ecological crisis we are experiencing in the Anthropocene might require other kinds of affective techniques of governing science than those fostered by austerity. It definitely requires a collective reflection about the role and effect of affects in the government of science.

## Note

1. FP7 is the seventh Framework Programme for Research and Technological Development of the European Union, founded to support research on specific themes. It lasted from 2007 to 2013 and was then replaced by H2020 (2014–20). For now, it has been the main Framework Programme that funded ES research.

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