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► **To cite this version:**

Gabrielle Bouleau. The WFD Dreams: between ecology and economics. Water and Environment Journal, 2008, 22 (4), pp.235 - 240. 10.1111/j.1747-6593.2008.00122.x . hal-00749874

HAL Id: hal-00749874

<https://hal.science/hal-00749874>

Submitted on 8 Nov 2012

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1 Bouleau, G. 2008 Water and Environment Journal **22** (4): 235 - 240.

2

3 **The WFD dreams: between ecology and economics.**

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7

8 **Abstract**

9 The enactment of the Water Framework Directive (WFD) in the European Union triggers
10 intense activity among Member States and raises some criticisms. The good status of waters
11 may include an ecological dream that is difficult to achieve. Moreover, criteria for derogations
12 require strong economic arguments. This challenge raises the debate whether the WFD is part
13 of an incremental process, embedded in prior European water law, with feasible goals, or
14 whether it is a dramatic change of policy towards an ecological dream which emerged during
15 late negotiations, therefore hardly achievable. I will state that although the high ecological
16 ambition of the WFD is unprecedented within the EU's water law, it has several precedents in
17 other arenas, notably long enforced in the United States of America. I will argue that the
18 major challenge of the directive is the combination of the ecological dream with an economic
19 ideal, which has no equivalent in the US.

20 **Key words**

21 Biodiversity, Conservation, European Directive, Planning, River Basin Management, Water
22 Framework Directive, Policy

23 **Introduction**

24 Established on 23 October 2000, the Directive 2000/60/EC of the European Parliament and of
25 the Council of Ministers, also known as the Water Framework Directive (WFD), provides a
26 framework for Community action in the field of water policy. It requires the EU Member
27 States to bring (and maintain) their surface water bodies to a "good ecological status" (GES),
28 and simultaneously a "good chemical status" (GCS). Derogations to a GES are possible for
29 water bodies defined as "heavily modified" or "artificial". Water bodies are considered
30 "heavily modified" by human impacts when the costs of alternatives are disproportionate.
31 "Artificial" water bodies, by definition, are those made by humans. What is cutting edge in
32 the WFD directive is that it considers only two possibilities for aquatic systems: Water bodies
33 are either impacted by acceptable services, or they should achieve the "good surface status"
34 (i.e. both the ecological status and the chemical status should be good). The services are
35 regarded as acceptable under the WFD criteria when replacing them by an alternate solution
36 will induce disproportionate costs. There is no room for "good surface status" (GSS) to be
37 undesirable, or poorly profitable impacting services to be desirable. The GSS is the desirable
38 and achievable dream of the WFD. The impacts that prevent water bodies from achieving the
39 good ecological status must match an economic demand and target the full pricing. It must be

40 added that the WFD includes provisions for dealing with the technical unfeasibility of
41 restoration (unsuitable natural background, extreme events ...) but they remain limited.
42 Emerging is the challenge that many human impacts affect the ecological status of water
43 bodies, but do not fall within the preceding economic definition of heavy modifications. In
44 such cases, achieving a good ecological status appears to be very uncertain (Holzwarth 2002;
45 Moss 2003; Mostert 2003; Roche, Billen et al. 2005). In this context, some critical actors
46 claimed that the ecological dream of the WFD was inappropriate to the European long-settled
47 landscape. They argued that the reference to an undisturbed situation is irrelevant and sets
48 unfeasible goals.

49 The feasibility of the WFD ecological provisions appeared all the more uncertain since recent
50 works on the origins of the WFD underscored its unprecedented ecological ambition.
51 Exploring the evolution of water issues at the EU level, scholars typically developed two
52 narratives, incremental versus chaotic. The incremental narrative focused on the evolution of
53 the European water law prior to the WFD enactment from 1975 to 1995 (Kallis and Nijkamp
54 2000; Kallis and Butler 2001; Aubin and Varone 2002; Barraqué 2002; Kaczmarek 2006). It
55 accounted for the consistence of the WFD with previous water directives as far as
56 environmental objectives were concerned. However it considered that the ecological
57 objectives were unprecedented. The chaotic narrative focused on the directive negotiation
58 from 1996 to 2000 (Aubin and Varone 2002; Kaika and Page 2003; Page and Kaika 2003;
59 Kaika 2004). It accounted for the strong lobbying movement of ecologists and the
60 Parliament's empowerment during the legislative negotiation. It held that the ecological
61 ambitions of the WFD were highly unpredictable and lately introduced. Both perspectives
62 supported the idea that the WFD ecological dream had no equivalent. Incidentally such a
63 statement supported the critics mentioned above. Without possible comparison, the WFD
64 would boldly go where no man has gone before. Feasibility would be all the more uncertain.

65 Yet both explorations restricted their scope to the water sector and at the European level. I
66 propose to enlarge the scope outside the water sector, or beyond and below the European
67 level. I will show that there have long been equivalents of the WFD ecological dream as
68 worded in the WFD with concepts as: "reference sites", "ecological status", and
69 "environmental objectives". I will argue that finding similar concepts in another context will
70 provide both interesting comparisons and useful feedbacks from which to draw insights into
71 the feasibility question. In the first part of the paper, I will first resume the EU *acquis* in order
72 to show that ecological goal-setting have existed in the European Community since 1979. I
73 will then address the scope of the WFD negotiation, in order to assess what it did and what it
74 did not change. In a third part, I propose to compare the WFD with some elements of the
75 United States law that have been enforced. Last, I will discuss the differences between the
76 US provisions and the WFD to conclude on the very nature of the WFD challenge.

77 **The EU *acquis* prior to the WFD**

78 The WFD is not the first European legislation on water quality. Twenty-eight directives
79 addressing water quality were adopted prior to it not to mention sister directives. Water
80 experts concur in describing two historic waves of legislation which follow each other with an
81 inner logic. In this paragraph, I will argue that the attention paid to the growing European
82 water law (1) was valuable to account for the consistence of EU water law, but (2) it failed to
83 notice that the water sector has been relatively impervious to ecological concerns despite a
84 growing ecologist movement in the EU since the late 80s. This gap was bridged by the WFD

85 which therefore appears like a big shift. In contrast, the EU nature conservation law
86 incorporated ecological requirements much earlier.

87 European analysts typically hold that the WFD inherited from two waves of European law in
88 water quality. The first one happened aimed at protecting consumers' health; the second one
89 followed, between 1988 and 1995, and promoted broader command and control based on an
90 integrated approach (Kallis and Nijkamp 2000; Aubin and Varone 2002; Barraqué 2002;
91 Kaczmarek 2006). But both waves set environmental objectives rather than ecological ones
92 (Howarth 2006).

93 The first legislative wave introduced reporting requirements. It empowered the public by
94 opening access to administrative data and fostered progress in monitoring technologies. The
95 directives on fish, shell farming and aquatic pollution prevention were poorly translated in
96 national regulations (Kallis and Nijkamp 2000). The other directives (water for drinking
97 purposes, water for swimming, pollution caused by certain dangerous substances and
98 groundwater preservation) paved the way for the second legislative wave based on the
99 integrated approach.

100 For European experts on water, the second wave stemmed from an inter-governmental
101 workshop on the European Community policy for water held in Frankfurt in June 27 and 28,
102 1988. Two years before, the Rhine happened to be dramatically polluted by the accident of
103 Sandoz. Confronted to the downstream polluted flow, the Dutch population feared a lack of
104 drinking water supply. Other Europeans suddenly discovered on their television screens that
105 the Rhine was transporting tons of dead fish. Environmentalist politicians gained power in
106 riparian countries (Lodge 1989; Vogel 2005). They influenced positions of the Council of
107 Ministers. At the end of the Frankfurt workshop, the European Council of Ministers asked the
108 Commission to submit proposals likely to improve the ecological quality of European waters.
109 According to Aubin and Varone (2002), this was the impetus for three directives based on an
110 integrated approach: the urban waste water directive, the directive on nitrates, and the
111 directive controlling industrial pollution, known as IPPC. All three require the designation of
112 environmental quality objectives, action planning to reach the objectives and restriction on
113 polluting activities.

114 In this perspective, the WFD appears as a third wave of legislation addressing the ecological
115 quality for the first time. Indeed, in the field of water management, environmentalists only
116 succeeded in introducing ecological objectives during the negotiation of the WFD, because
117 they benefited from the negotiation procedure as I will develop in the next part. This does not
118 mean that the concept of ecological objectives did not exist before.

119 Substantive ecological input for goal-setting was adopted in the European Community
120 legislation earlier in the sector of nature conservation (Bouleau 2007). For twenty years
121 before the WFD, the Bird Directive (79/409/EEC) has required the preservation of naturally
122 occurring birds in the wild state. It sets *environmental objectives*. It requires the assessment of
123 the *biological status* of the species listed in its annexes. I argue that this directive was the first
124 European legislation protecting the environment for its own sake. It was limited to threatened
125 species and was based on an organismic vision of ecological communities (Richardson 1980).
126 Then the Habitats Directive (92/43/EEC) expanded the scope of protection to functional
127 biodiversity throughout an open network of sites (Pinton 2001). I therefore conclude that an
128 ecological dream can be tracked back in the European legislation as early as 1979 with the
129 Bird Directive. Ecologists may have influenced the content of the WFD much more than the
130 content of former directives, yet they have been promoted the dream of a better ecological
131 status in the European Community for long. As I will now argue in the following paragraph,
132 the ecologist influence over the WFD can not be reduced to the ecologist lobbying at the
133 Parliament during the negotiation. The articulation of water quality with "normal" values of
134 biological elements was already set.

135 **The scope of the WFD negotiation**

136 The role of environmentalists during the WFD negotiation was well studied by political
137 scientists. They brought compelling statements showing that the political context of the
138 European arena was, and still is, very uncertain. It resulted in unexpected trade-offs
139 (Richardson 1994). The co-decision rule made the situation even more uncertain since it
140 empowered the European Parliament to veto the Council of Ministers's amendments (Kaika
141 and Page 2003). Authors considered that the crucial negotiations of the WFD opposed
142 Member States (Council of Ministers) on the one hand, and a coalition of the Parliament and
143 the Commission on the other hand (Kallis and Butler 2001; Aubin and Varone 2002). They
144 found that the Parliament had proven exceptionally active and very sympathetic to the
145 aspirations of the environmentalists (Judge 1993; Kallis and Nijkamp 2000).

146 In the following paragraph, I will first argue that the activism of the Parliament and
147 environmentalists (Earnshaw and Judge 2005) counterbalanced industrial lobbying but they
148 hardly introduced any conceptual innovation. The directive proposal was initially framed by
149 the Commission and its ecological rationale remained unchallenged. Then, I will defend that
150 Member States and industrial lobbies did not contest the ecological relevance of the directive
151 because there was substantial evidence of the feasibility of its implementation. Most concepts
152 had been already implemented in some European countries.

153 Kaika and Page (2003) reported in details the process of readings and amendments by both
154 the Council of Ministers and the European Parliament from 1996 to 2000. My goal in this
155 paper is not to relate all their findings but to use them to identify the scope of the debate
156 between the Council and the Parliament. The authors pointed out four significant issues that
157 were at stakes. The Parliament wanted binding environmental objectives whereas the Council
158 "proposed that the directive should 'request' that MS 'make an effort' to achieve the good
159 surface status". The Parliament wanted short implementation deadlines (ten years) whereas
160 the Council required twenty to thirty years. They disagreed on the phase-out of hazardous
161 substances. The Council rejected the zero emission approach. Last, the Parliament wanted to
162 introduce full-cost pricing as a strategy for managing water demand whereas the Council was
163 reluctant. Obviously, the points of disagreement did not include the definition of "good
164 ecological status," nor the reference to undisturbed conditions.

165 Two reasons may explain why these concepts were not challenged. One is that 'green'
166 Member States were in favour of these concepts. Another reason is that other Member States
167 did not find an economic justification that could fit in the general framing.

168 The ecological dream - ecological quality being desirable and achievable - was familiar at
169 least to the German and to the Austrian. Since 1971, the German programme for the
170 environment has defined criteria of ecological balance and water pureness (Defrance and
171 Jeuffroy-Niehues 1992). The ecological integrity has been established in the Austrian Water
172 Laws since 1985 (Moog and Chovanec 2000). The ecological dream was probably also
173 supported by other EU 'green leaders', as political scientists called them (Borzell 2000; Jordan
174 and Lenschow 2000; Bursens 2002). Germany, Denmark and the Netherlands together with,
175 since 1995, Sweden, Finland and Austria held sufficient votes to block qualified majority
176 voting decisions in the Council (Lieverink and Skou-Andersen 2005). However, little
177 evidence exists on the effectiveness of the coalition during the WFD elaboration. Beyond
178 'green leaders' several Member States had adopted ecological monitoring for assessing rivers
179 from the biota.

180 What is significant is that before the negotiation of the WFD started, the Commission
181 proposed in 1993 a framework directive on the ecological quality of freshwaters (COM (93)
182 680) which was later resumed in the proposal of 1996. This initial proposal defined ecological
183 water quality as the overall expression of the structure and function of the biological

184 community, also taking into account physical and biological integrity of waters. Its wording
185 and content came closer to the ones of the WFD than anything previously seen in the EU
186 water legislation. It mentioned the pureness of water, the wildlife diversity, the ecological
187 quality of waters, and it required goal-setting for all waters. Later discussions tuned the
188 practical implementation of such concepts but did not reconsider them.

189 For those who did not agree with the ecological dream, they had to defend the opposite
190 position, i.e. that the ecological quality of WB was not always desirable or that something else
191 was more desirable. Nothing could be more desirable than the ecological quality but the
192 economic benefits. Political scientists demonstrated that the history of the creation of the
193 European Union is one of a common market. Environmental issues and health protection
194 came as a second goal in the political agenda of the European Communities (Hildebrand
195 2005). Social, cultural, moral issues were so different from one country to another that it had
196 shown to be very difficult to build a coalition on them. Provisions were included for defining
197 less stringent objectives which had to be justified by economic considerations. No Member
198 State raised the question of the achievability of the good ecological status, because some
199 knew they would largely advocate having heavily modified waters and others knew they
200 could achieve the goal.

201 To conclude this part, I will say that the initial framing of the directive as proposed in the
202 1993 draft already included the ecological dream. It matched the aspirations of at least some
203 stakeholders and did not provide much room for objections in a market-driven context. I will
204 now argue that concepts and aspirations for an ecological dream emerged in the 1970s and
205 have long been implemented in the US legislation. This may provide fruitful comparisons for
206 future studies.

207

208 **The American example**

209

210 Whether the American example had a direct influence on the WFD provisions is beyond the
211 scope of this article. My intent is to find similarities and anteriority which may provide
212 interesting feedbacks. Nevertheless, there are significant elements acknowledging the indirect
213 influence of American ecologists (Carson 1962; Meadows and Club de Rome 1972) on the
214 global political agenda since the sixties. Social scientists hold that the student social
215 movement of 1968, which was born in the United States, was the beginning of
216 environmentalism in all developed countries (Rootes 1999). Moreover, political scientists
217 have developed compelling arguments stating an influence of the US legislation on the
218 European policy-making (Vogel 1997; Löfstedt, Vogel et al. 2001). While scholars have
219 studied many different domains of regulation (Jordan 2005), they hardly undertook a US
220 versus EU comparative on the evolution of the water law. This may be due to the lack of a
221 European consistent water law until the recent WFD. In contrast, the US enacted a Clean
222 Water Act (CWA) as early as 1972. For scholars tracing regulatory innovation, the 'old' US
223 water legislation was probably not regarded as cutting-edge. In addition, when regulations
224 were compared, scientists looked for similarities within a decade. The time lag between the
225 CWA and the WFD may have prevented comparison. Yet, bringing close together the US
226 Clean Water Act enacted in 1972 and the WFD adopted 28 years later, one can see striking
227 conceptual similarities.

228 Comparing the CWA to the WFD reveals at least five common notions: references, goal-
229 setting, criteria for down-grading standards, provision for no further degradation and
230 undesirable substances.

231 The first, and the most interesting for the purpose of this paper, refers to the unimpacted
232 reference. The CWA requires biological monitoring to assess the ecosystem integrity of
233 waters. This integrity is defined by the biological composition of sites in pristine conditions or

234 without human impacts. This language is closed to the one used in the Annex V of the WFD
235 defining the ecological status.
236 Concerning goal-setting, waters within the scope of the US legislation should be achieved
237 water quality standard in order to sustain designated uses. Such uses should include
238 swimming and fishing. Besides, since the Endangered Species Act was enacted in 1973, the
239 federal agencies have required the designated uses to target the ecological integrity of
240 endangered species habitats. This sounds like the requirement for a good surface status in the
241 WFD. Because the CWA has been in place for about 35 years with a target of final phase II
242 implementation of 2008, the time frame of the WFD may appear much narrower. Indeed the
243 good surface status has to be achieved by 2015. But possible derogations may extend the
244 deadlines up to 2027. Moreover the CWA in 1972 included new requirements for waste water
245 treatment. Similar provisions have already been required by former directives.
246 Concerning criteria for setting less stringent goals, in the US legislation, the economic
247 criterion that may justify down-grading goals is when achieving the high quality standard
248 would involve widespread social and economic costs. But one must notice that three criteria
249 of feasibility are also considered: when irreversible human-caused conditions prevent the
250 attainment of a higher standard; when what is needed to attain the standard would cause
251 substantial environmental damage; and when natural background conditions prevent
252 attainment. Altogether the economic and the three technical criteria echo the WFD language.
253 The no further degradation requirement is a provision that appears in both legislations.
254 The last element I want to mention is the common provision for suppressing undesirable
255 substances from the waters.
256 From the above list of conceptual resemblances, I conclude that the ecological dream pursued
257 by the WFD is very close to what the US have tried to achieve for thirty years.

258

259 **The American difference**

260

261 I shall now look at other provisions of the CWA. Indeed I believe that the remaining
262 differences between both regulations are extremely important to consider. I will focus on
263 three: the scope, the planning process and the binding conditions.

264 Considering the scope, the WFD applies to freshwater and groundwater. If the ecological
265 provisions only apply to surface waters, the good chemical status is also required for
266 groundwater. In contrast, the CWA concerns the US waters, namely the navigable waters. If
267 the US Supreme Court has expanded the scope of navigable waters to the tributaries and the
268 related groundwater (Sax, Thompson Jr et al. 2006), groundwater overdraft remains beyond
269 the scope of the CWA whereas it should not happen under the WFD. In addition, the WFD
270 targets all kind of degradation whether the source is point or non-point. US Federal agencies
271 instead have no legal competencies for addressing non-point pollution. The scope of the WFD
272 is therefore broader.

273 Concerning the planning process, the WFD provides that Member States shall plan the
274 combination of the best efficient measures to restore all water bodies of the same
275 hydrographical district. Moreover the EU does not intend to fund restoration projects. Part of
276 the WFD economic dream is that water services should cover costs including environmental
277 ones. The CWA has no equivalent strategic requirement. Although restoration projects in the
278 US are often subjected to cost-effectiveness appraisal on a project by project basis, strategic
279 planning at the scale of a catchment is almost never required in the US. Moreover cost-
280 recovery is hardly demanded to US water services.

281 Last, I will now compare the binding conditions of both water laws, which go beyond
282 legislative acts. I need to address the political structure of the US federation and the
283 originality of the EU system. The US Congress sets goals to federal agencies and obligations

284 for other parties under the federal rules. On the one hand, the performances of federal
285 agencies are regularly appraised and administrative sanctions may be voted by Congress in
286 case of failure. On the other hand, obligations of other parties under federal laws are enforced
287 by courts. What is authorized and what is not evolves under Common Law. But at least a
288 compelling causal relationship must be established by the court before any party be charged
289 for the degradation of US waters. Consider the recent case on the Californian Delta smelt. The
290 endangered smelt population is protected under federal law. Many factors impact the threaten
291 fish including non-point pollution and pumping devices (Lund 2007). More than once, the
292 Supreme Court summoned a federal agency to stop pumping to preserve the smelt. But it
293 could do nothing against the non-point pollution. The smelt population may die from non-
294 point pollution and nobody may be charged for it. In contrast, the EU directives set goals to
295 the Member States (Porta 2006). No causal relationship is needed to assess whether Member
296 States achieve EU goals or not. Whoever is responsible for the failure, Member States are
297 likely to be charged for it. It is left to them to act accordingly in changing their domestic rules
298 or incentives in order to achieve the goals. Member States are legally bound to perform
299 effectively. Imagine the delta smelt case in the EU context, the State of California could be
300 charged for the delta smelt being killed by non-point pollution. European Member States bear
301 the burden of proving that it may have been unfeasible to avoid such a failure. Otherwise they
302 are subjected to penalty payments. Since 1997, three penalty payments have been imposed.
303 No case involved non-point pollution though. It may be too soon to conclude whether the EU
304 will succeed to reduce non-point pollution by economic incentives on Member States. But this
305 can be regarded as another element of the WFD economic dream.
306 While the WFD targets a broader scope of waters than the CWA, it is also much more
307 demanding concerning the efficiency of public funds: water consumers should cover the
308 costs; restoration projects should be consistent basin-wide.

309 **Conclusion**

311
312 It cannot be argued that the ecological dream of the WFD was furtively introduced by
313 environmentalists during the negotiation of the directive without consideration whether it
314 could apply to Europe. Corresponding ecological concepts and aspirations have long existed
315 in the United States, in the EU legislation for nature conservation, and in some Member States
316 domestic legislations. This advocates for such a dream being reasonable, at least in some
317 places. It also provides a valuable set of possible comparisons in order to identify most cost-
318 effective measures. What may be much more challenging in the realization of the WFD is its
319 economic dream mainly, which arose from stringent obligation upon Member States, and
320 which has no equivalent. The economic provisions prevent contradictory investments,
321 promote most cost-effective measures and target incentive pricing. On the long run, European
322 environmental and economic engineering may benefit from such provisions on the promising
323 world market for restoration.

324 **Acknowledgements**

325 The comparison between the EU and the US water law has been supported by Cemagref. I am
326 very thankful to Nadine Soubotin for her revising work. I am also grateful to the anonymous
327 reviewers for their very constructive comments which helped me to clarify my whole
328 argument.

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