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# Water Quality Standards: A Scientific and Theological-Ethical Analysis

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## Water Quality Standards: A Scientific and Theological-Ethical Analysis

Drama, scripts, plot twists, and character development are all elements we think of as connected to good movies or television shows; none of these would seem to be promising elements to find in the federal and state process for setting surface water contaminant standards for human health. In fact, the actual process by which water quality standards are set would make a fine mini-series, with outcomes like equity and the health of future generations hanging in the balance until the final denouement. The complexity, players, political and ethical dimensions, and nuances of who possesses power in this process, and what populations are protected—or unprotected—by the standards established are the topic of this article. The primary focus is one of the most vulnerable human populations in the Columbia River Basin—indigenous peoples—and also the special vulnerability of infants, children, and women, especially pregnant women, in the contaminant standard setting process.

Surface water quality standards in the United States are established on a state-by-state basis, using criteria supplied by the U.S. Environmental Protection Agency (EPA). While this may sound like it should be a straightforward process of applying numerical criteria about contaminants, nothing could be further from the truth. Of all the states in the United States, Oregon has emerged from a decade-long process with what are the most stringent surface water quality standards for the protection of human health in the country. Oregon is of special interest as well because the aforementioned tribal population raises issues of how the principles of prudence and protection of the vulnerable are or are not applied in our political arena.

The dangers of surface water contaminants to human health take different forms.<sup>1</sup> We focus on the Ambient Water Quality Criteria (AWQC) for the Protection of Human Health provided in the U.S. EPA Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health.<sup>2</sup> These criteria deal with maximum allowable concentrations of hundreds of regulated chemicals. While exposure by consuming water is always a possibility, the most significant avenue through which people are exposed to contaminants in fresh water is the consumption of fish. Many toxic chemicals bioaccumulate over time in the bodies of aquatic organisms, and by consuming fish we are exposed to the toxins in their bodies. Demographic variables such as other racial identities, educational level, and income are associated with disproportionate health impacts for some populations in terms of greater fish consumption and their health.<sup>3</sup> For example, for highly exposed groups like subsistence fishers, a given toxin concentration in the water will pose a much greater risk of disease. Once ingested, toxins can have a variety of impacts: Some initiate cancers, others promote cancer growth, still others have neurological impacts that can result in cognitive deficits or loss of motor coordination, and many toxins have especially strong impacts on infants and children because of immature bodily defenses and

rapid cell division rates. The sum of the toxins a person carries in his or her body is referred to as that person's body burden, and some excellent material available from the Environmental Working Group discusses the details of adult and infant body burdens.<sup>4</sup>

### Forming a Scientific and Ethical Framework

In 1986 the U.S. EPA released Quality Criteria for Water,<sup>5</sup> known as the "Goldbook" (replacing the U.S. EPA "Redbook" water quality standards of 1976),<sup>6</sup> and using these criteria the Oregon Department of Environmental Quality set surface water quality standards in 1991 for contaminants that were approved by the U.S. EPA. Under what is commonly called the Clean Water Act (1972, and amended in 1977 and 1987), states are required to review their water quality standards periodically, but at least every 3 years. In 1999 Oregon was still using the 1991 water quality standards for contaminants,<sup>7</sup> but the U.S. EPA had not released new guidance on contaminants since 1986. In 1999 the U.S. EPA released the new 2000 Methodology in draft form.<sup>8</sup> Oregon then began a process of reviewing surface water quality standards for contaminants, years after the last triennial revision had taken place. At roughly the same time that the new U.S. EPA draft methodology was released, a second and parallel script emerged, based on ethical and theological reflections for how the dominant culture should interact with Native peoples in the Northwest. In 2001, at the end of a years-long process, the Roman Catholic Bishops within the Columbia watershed issued a pastoral letter, *The Columbia River Watershed, Caring for Creation and the Common Good, An International Pastoral Letter by the Catholic Bishops of the Region*, also known as the Columbia River Pastoral Letter Project (CRPLP).<sup>9</sup> The Columbia River Pastoral Letter is a fairly specific practical treatment of the major issues and problems resident within the Columbia Basin through the major aspects of Catholic Social Teaching, also known as the modern Catholic Human Rights Tradition.

The CRPLP was an unusually inclusive pastoral letter process, which began with multiple listening sessions with public testimony about what the river meant to the lives of diverse inhabitants throughout the entire basin, and some of those sessions occurred on tribal lands. Moreover, tribal people and institutions were represented on the CRPLP steering committee. The result was very positive, as it involved a deep ethical reflection on the historical and current circumstances and relationships in the region, and led to the rapprochement between the tribal peoples within the Columbia Basin and the Catholic Church in the Pacific Northwest. The letter concludes with 10 ethical norms for "Community Caretaking," one of which is the following:

*Respect the Dignity and Traditions of the Region's Indigenous Peoples.*

*The indigenous peoples have a wealth of spirituality, culture and traditions that call forth a need for appropriate respect and preservation. We are brothers and sisters in God's creation and we are grateful to the First Nations and the Native Americans for the lessons they teach about respect for nature. We apologize for cultural insensitivities and lack of justice, both past and present. Today, we extend an offer of peace and friendship to native peoples of our region. We pledge to work with them to seek equitable resolutions of conflicts over treaty rights, to work with them to enhance their engagement with other cultures, to foster their economic*

*development and to participate with them to promote care for creation. We call upon the members of our parish communities, government officials, those with economic interests and the general public to join in these efforts.*<sup>10</sup>

That statement might have formed from the outset the underpinnings of a way to initiate a broad regional discussion for setting water quality standards. Had this inclusive lead been followed, the Columbia River tribes would have begun as a significant contributing factor in establishing regulations. In the actual events, a state interpretation of the federally designed process was followed, and the process to reset and update water quality and fish consumption standards in Oregon was carried forward until the process eventually failed and had to be reexamined. Disregarding the voices of the Columbia River Basin inhabitants resulted in delaying updated and effective protection of the state's population by roughly a decade.

### The Mathematics of Acceptable Toxicity

The process actually used in Oregon to review water quality standards was based on state implementation of federal guidelines in a complicated way that involved numerous official groups and an extensive hierarchy. The Oregon Department of Environmental Quality (ODEQ), Oregon's state agency charged with this task, convened two committees. The first, the Technical Advisory Committee (TAC), was composed of scientists from state and federal agencies and from academic institutions.<sup>11</sup> The second, the Policy Advisory Committee (PAC), was composed of "external stakeholders" and a group of nonvoting agency advisors.<sup>12</sup> The stakeholders ranged from environmentalists and representatives of different industries to ranchers, farmers, and a tribal representative.<sup>13</sup>

In the Oregon process, the TAC made recommendations, the PAC would review and perhaps modify those recommendations, and the ODEQ then used the committee reports to prepare a proposal to pass on to the Environmental Quality Commission (EQC). The EQC is a five-member citizen panel appointed by the governor of the state for 4-year terms and approved by the state senate. EQC acts as ODEQ's policy and rulemaking board.<sup>14</sup> This complex and multitiered process therefore granted the authority to ratify or modify ODEQ actions to a board appointed by the governor.<sup>15</sup>

The Native American tribes in Oregon, notably for this article the Umatilla, signatories to the Treaty of 1855, retained legal rights related to fishing in the Columbia basin on the basis of this treaty ratified by the U.S. Senate: "the exclusive right of taking fish in the streams running through and bordering said reservation is hereby secured to said Indians, and at all other usual and accustomed stations, in common with citizens of the United States."<sup>16</sup> This treaty eventually gave the tribes their own perspective and voice as water quality deliberations unfolded.

Preparing to analyze the scientific and theological-ethical implications of the U.S. EPA Methodology for Deriving Ambient Water Quality Criteria (AWQC) for the Protection of Human Health—released in draft form in 1999 and final form in 2000<sup>17</sup>—calls first for careful

examination of some of the language of that document. Three generalized equations exist for deriving AWQC, one for noncancer effects of toxins, one for cancer with a nonlinear low dose extrapolation, and the third for cancer with a linear low-dose extrapolation. The entirety of the equations can be informative,<sup>18</sup> though for our purposes we need only consider several of their terms and assumptions.

For all three of the equations for deriving AWQC just mentioned,<sup>19</sup> the term “BW” is the default human body weight, set at 70 kg. This (154 lb) value, clearly not the weight of a child, and very often not the weight of an adult woman, means that the toxin concentrations set as “acceptable” will protect only people who weigh 70 kg or more, assuming they eat the amount of fish viewed as typical. Combined with a low value for fish consumption rates, this default human body weight would not protect many women or any small children from excessive toxin intake. No special consideration is given in the formulas in section 1.6 of the U.S. EPA Methodology to pregnancy, infancy, childhood, or to people belonging to subgroups of the population that weigh less than 70 kg on average.

The equations in section 1.6 also include a term for fish consumption rate,  $F_i$ , which includes various trophic levels “i” for different types of fish (herbivores, primary consumers that eat small organisms, etc.). For practical use an overall default fish consumption rate (for all trophic levels of fish) is given: “defaults for total intake = 0.0175 kg/ day for general adult population and sport anglers, and 0.1424 kg/day for subsistence fishers.”<sup>20</sup> A typical can of tuna fish weighs 175 grams; 0.0175 kg equals 17.5 grams. Therefore for the general population, the U.S. EPA default daily fish consumption rate is equal to a volume of fish that matches 1/10 of a can of tuna fish. For subsistence fishers, that is, people who are surviving heavily on catching fish, the equations allow a volume equal to about 81% of a standard can of tuna fish daily. By most standards, this is not very much to live on. These default fish consumption rates are highly problematic, since water quality standards for toxins would not protect people who ate more fish than these amounts.

The U.S. EPA Methodology says in section 1.6, Overview of the AWQC Methodology Revisions, “The choice of default fish consumption rate for protection of a certain percentage (i.e. the 90th percentile) of the general population is clearly a risk management decision.”<sup>21</sup> It goes on to say in section 2.4 on cancer risk, “EPA intends to use the  $10^{-6}$  risk level, which the Agency believes reflects an appropriate risk for the general population. EPA’s program office guidance and regulatory actions have evolved in recent years to target a  $10^{-6}$  risk level as an appropriate risk for the general population.”<sup>22</sup> And then in the next paragraph it says, “EPA believes that both  $10^{-6}$  and  $10^{-5}$  may be acceptable for the general population and that highly exposed populations should not exceed a  $10^{-4}$  risk level. States or tribes that have adopted standards based on criteria at the  $10^{-5}$  risk level can continue to do so, if the highly exposed groups would at least be protected at the  $10^{-4}$  risk level. However, EPA is not automatically assuming that  $10^{-5}$  will protect ‘the highest consumers’ at the  $10^{-4}$  risk level.”<sup>23</sup>

The translation of this is as stark as it seems. The general population target is one incremental cancer per 1,000,000 people. For more vulnerable people who consume a lot of fish, such as

tribal people in the Northwest, the criterion can be set at one incremental lifetime cancer per 10,000 people. Tribes and states are free to use more stringent criteria, but can choose to be less protective of more vulnerable groups than the U.S. EPA would allow for the general population. A legal analysis of this issue notes: “Although the EPA has developed, in response to two executive orders on environmental justice and children’s health, a small body of work that urges use of these standards to protect the nation’s most vulnerable populations, there has been no regulatory response to date.”<sup>24</sup>

The health issues related to environmental justice and tribal peoples have been of prior concern, with the recognition that fish consumption rates place tribal populations at much greater health risks due to consumption of environmental toxins than members of the dominant society.<sup>25</sup> Other questions about the right to a safe environment and social justice have been raised before in this periodical in general senses<sup>26</sup> and in specific instances as with Maori land claims, and the special vulnerabilities of women and children to flood events in Bangladesh.<sup>27</sup>

In section 2.8.2 of the Methodology, the U.S. EPA allows for more stringent regulations based on site specificity: “The 2000 Human Health Methodology allows for site-specific modifications by states and tribes to reflect local environmental conditions and human exposure patterns. ‘Local’ may refer to any appropriate geographic area where common aquatic environmental or exposure patterns exist. Thus ‘local’ may signify regional, a river reach, or an entire river.”<sup>28</sup> This caveat might allow local tribal areas to be protected in the Columbia River Basin, if water did not flow downhill. However, water does, and any local criteria that do not apply to the whole system—which is a river well over 1,000 miles long—will not protect individuals downstream from areas where less stringent criteria are in force.

To give the U.S. EPA due credit, it discusses a continuum of ways to set fish consumption rates.<sup>29</sup> The U.S. EPA would most prefer states to use a fish consumption survey of the people they are setting water quality standards for in their actual location, and would least prefer states to use its default values of 17.5 grams per day for the general population and 142.4 grams per day for subsistence fishers.

#### TAC and PAC Recommendations (and the Reality)

In 2003, after many TAC meetings and discussions of 219 toxins for which the existing Oregon and the 2000 Federal Water Quality Standards were discrepant, the TAC reported a recommended set of fish consumption rates to the PAC.<sup>30</sup> The TAC recommended a three-tier system of fish consumption rates: in areas of low intensity fish consumption (rare in the Columbia River Basin), 17.5 grams per day; in areas of medium intensity fish consumption, 142.4 grams per day (the U.S. EPA fish consumption level for subsistence fishers); and in areas of high fish consumption (such as areas with tribal communities along the river), 389 grams per day. The latter number was from a fish consumption survey conducted in 1994 by the Columbia River Intertribal Fish Commission (CRITFC), an organization that acts for the Umatilla, Nez Perce, Yakama, and Warm Springs Tribes in matters related to the Columbia River fishery

and its governance.<sup>31</sup> The CRITFC report showed that the fish consumption rate for tribal members was 170 grams per day at the 95th percentile, and 389 grams per day at the 99th percentile. The TAC value was therefore intended to set maximum contaminant concentrations in a way that would be protective for tribal members who consume the most fish.

PAC questioned the TAC fish consumption rates.<sup>32</sup> The issues PAC raised included whether this approach would produce inequities by forcing individuals and businesses upstream to adhere to higher water quality standards to comply with the maximum toxin concentrations allowed downstream in an area of higher fish consumption, and whether the criteria should be set to protect the general population of Oregon or high fish consumers. PAC also questioned whether accurate fish consumption rates were available for the general population. A variety of opinions existed in the PAC and the members could not come to an agreement on what they would recommend. PAC was constituted to reflect broad economic and social interest groups of the state, and what the different groups thought important did not necessarily align. The TAC and the PAC never met to discuss these concerns; in the end TAC passed its three-tier recommendation to ODEQ, and PAC deadlocked.

Consequently, the ODEQ took the TAC recommendation and PAC nonrecommendation and decided to propose one fish consumption rate for setting water quality standards in the state for the EQC to act on: 17.5 grams per day.<sup>33</sup> This proposed level of fish consumption was weaker than the TAC recommendation, weaker than the weakest federal recommendation for areas of high fish consumption, and essentially ignored the entire issue of the tribes and the CRITFC fish consumption survey. The EQC adopted standards based on 17.5 grams per day of fish consumption, and these were passed to the U.S. EPA for approval as part of the new state water quality standards.

The U.S. EPA was unamused. ODEQ had used the least preferred method for setting fish consumption standards, and had ignored tribal peoples, who now began to object to the proposed Oregon rules. The U.S. EPA declined to take action on the proposed rules, and recommended that the state consider setting fish consumption rates at higher levels, 105–113 grams per day, in some waters to protect vulnerable populations. In 2006, Northwest Environmental Advocates, led by Nina Bell (one of the PAC members), and in concert with the Umatilla Tribe and CRITFC, sued the U.S. EPA in U.S. District Court to force it to act on the proposed Oregon rules.

Nina Bell's legal analysis of the issues involved in the lawsuit makes fascinating reading, and renders the ODEQ proposal to the U.S. EPA even more inexplicable from an array of legal perspectives.<sup>34</sup> In 2008 a U.S. District Court issued a consent decree indicating that the U.S. EPA must act on the proposed Oregon rules, but this decree was extended several times, ultimately to June 1, 2010. At that time the U.S. EPA rejected the proposed Oregon rules.

Meanwhile ODEQ, undoubtedly seeing this U.S. EPA rejection on its way, convened another committee, the Human Health Focus Group (HHFG). This committee was composed largely of toxicologists and risk analysts, with a support group that included U.S. EPA and CRITFC and

tribal representation.<sup>35</sup> The HHFG, whose final report and conclusions are available online,<sup>36</sup> echoed the TAC report. that a number of tribal fish consumption surveys in the region were available, including the CRITFC report already alluded to, and that 17.5 grams per day did not reflect fish consumption in Oregon. HHFG also indicated that rules should be based on fish consumers rather than the general population, and should protect individuals in the 90th or 95th percentile of fish consumers. HHFG used the fish consumption surveys for tribal people to propose that the 90th percentile of consumption would be 113 grams per day, and the 95th percentile would be 176 grams per day.<sup>37</sup> HHFG noted that present fish consumption rates might be suppressed among tribal people and others because of fear of environmental toxins; people eating more than 17.5 grams per day were at increased risk of heart, kidney, or liver disease, neurological disorders, developmental impacts, and cancer, among other medical issues. HHFG also raised the issue of the use of the default male body weight of 70 kg, and discussed that women and children are not protected by the use of this as a default value, and also the issue of complex chemical interactions that might increase risk, but these considerations were not included in setting the final fish consumption rate standards that the group recommended to ODEQ.<sup>38</sup>

ODEQ responded with a report in 2011, the Human Health Criteria Issue Paper, Toxics Rulemaking.<sup>39</sup> In it ODEQ proposed a fish consumption standard of 175 grams per day, which was promptly approved by the new EQC members, and passed to the U.S. EPA for approval. In October 2011, as the final chapter of this undertaking, the U.S. EPA approved the new Oregon rules.

## Ethical Metrics

The 12-year drama of establishing acceptable fish consumption standards in Oregon is admittedly daunting, and, aside from representing the obvious bureaucratic conundrum of establishing public policy, the process raises intriguing if not troubling ethical issues. To examine those issues one could use a variety of ethical positions. For example, we could approach the issues from a utilitarian perspective—the greatest good for the greatest number over the long term, also known as the “utilitarian calculus.” It is the “default” approach underlying much of U.S. public policy regarding human health and takes shape in cost–benefit–risk-assessment analysis.<sup>40</sup> On the other hand, we could take a deontological approach, which emphasizes moral obligation and duty in human action. Another approach receiving greater attention in public health matters is the precautionary principle, which states that in the absence of scientific certainty, precaution and prudence should guide human action regarding public health. The precautionary principle is the default approach of the European Union. We have opted for a human rights approach because, as implied at the beginning of this article we are, in part, motivated by Catholic Social Teaching and its application in the Columbia River Basin and how it has impacted tribal people. In addition to the Columbia River Pastoral Letter, we are also mindful of the fact that, according to Kristin Shrader-Frechette, the American Public Health Association (APHA) states that a human rights approach is the ethical foundation for public health policy.<sup>41</sup>



The modern Catholic Rights Tradition is one of two human rights approaches (the other being the 1948 U.N. Universal Declaration of Human Rights) that embody universal rights including individual, civil, and political as well as social and economic rights. Unlike the U.N. Declaration, however, the Catholic Rights Tradition is based on a theological principle known as the doctrine of the Imago Dei. That is, because human beings are created in the image and likeness of God (see Gen. 1:26–28)<sup>42</sup>, they are endowed with intrinsic worth and dignity (intrinsic value in philosophical environmental ethics). Consequently, human rights are absolutely necessary as minimal protections of human dignity. If there are individuals and/or groups whose rights are violated, then social justice (environmental justice if the source of injustice is an environmental matter) is required— citizen action by either legislative or other means through which rights are ensured. If in theory all of the rights of a given population are protected and promoted then we have approached what is called the common good. The common good is a flexible norm insofar as it can be applied regionally, as in the Columbia River Pastoral Letter, nationally and internationally as the universal common good, or even on a planetary basis—protecting the planetary commons. Ethically the common good is the “bottom line” or “litmus test” of how well any society or culture is doing in protecting its citizens’ rights. In the drama of establishing water quality and fish consumption standards in Oregon, the process falls within the categories of human rights, social and environmental justice, and the common good.

Through the lens of a theologically based human rights approach, the first major ethical issue is the application of the U.S. EPA water quality criteria for the general population and tribal people for cancer risk. As previously noted, the U.S. EPA Methodology applies a  $10^{-6}$  risk level for the general population, yet in the same paragraph implies that a risk level at  $10^{-5}$  “may be acceptable for the general population and that highly exposed populations should not exceed a  $10^{-4}$  risk level.” Moreover, tribes that have adopted a  $10^{-5}$  risk level can continue the practice provided that “highly exposed groups” are at least protected at the  $10^{-4}$  level of cancer risk. Aside from the obfuscating and ambiguous policy language, if viewed from the perspective of human rights, the discrepancy of allowable cancer risk between the general population (1 in 1,000,000) and tribal people, particularly “highly exposed groups,” (1 in 10,000) appears to violate the ethical standard of equal treatment, a standard that is anchored to the norm that all humans have equal rights by the very virtue of being a human being. Shrader-Frechette puts it this way: “Humans have rights . . . simply because they are human, and humans ought to be treated consistently or equally. Their claims for equal treatment are deserving of equal respect... Humans (regardless of their factual characteristics) are equal subjects of ‘moral value.’ Although they may differ in intelligence or physical strength, they are equally deserving of respect or consideration precisely because they are human. As a result, they have equal rights, equal claims to have their basic interests and needs considered.”<sup>43</sup>

The level of absurdity deepens when one considers the linchpin of cancer risk assessment and exposure—the default body weight of 154 lb. The HHFG report raised a red flag over the use of 154 lb in calculating exposure risk for water quality and fish consumption. In section 6.3 on “Sensitive Populations and Toxicity” the report states, “Of importance is early in utero and postnatal exposure of infants, and children and the elderly. There are critical periods of fetal

development and the effects of prenatal chemical exposures will differ depending on the dose and timing of the exposure. ... With respect to exposure, children are particularly vulnerable as compared to adults due to their lower body weight, differing metabolism and behaviors."<sup>44</sup> According to the same report, "Chemical exposure is expressed relative to body weight and is calculated from the concentration of chemical in fish tissue and the frequency and duration of fish consumption."<sup>45</sup> It goes on to explain the major issue between child and adult body weight in calculating risk by stating that "The variation of weight between children and adults is significant considering that newborns typically weigh 4 kg [sic]<sup>46</sup> (8 lbs.) while adults can reach weights of 113 kg (250 lbs.). Thus risk estimates for children versus adults can vary considerably. In the current water quality criteria guidance EPA recommends using an average adult body weight of 70 kg (154 lbs.) as a default body weight value in the water quality criteria calculations. While use of water quality criteria based on the adult default weight provides adequate protection for adults, it may not provide adequate protection for children."<sup>47</sup> Utilizing local tribal fish consumption rates for children and adults, the HHFG made some revealing calculations and concluded that its "figures suggest the need to consider greater fish consumption rates than adult rates to ensure full protection of children [to] specific exposure factors."<sup>48</sup> The HHFG presented a significant caveat in calculating exposure risk among tribal people in Oregon, but this essential information was ignored in the final outcome.

### Rippling Effects

Ethically where does that leave us? From the Catholic rights perspective there exists a spectrum of rights categories necessary to protect human dignity, one of which is "bodily rights" and includes right to life, bodily integrity, food, clothing, shelter, health care, social security, and so on. The issue of calculating cancer risk exposure due to fish consumption falls within this category, but it is entirely possible that establishing higher water quality standards and fish consumption rates could result in competing rights claims, such as the right to employment versus the right to health. For example, if more stringent water quality standards cause a pulp mill to close or lay off workers, their employment has been impacted and their family incomes threatened. In the Catholic rights approach the standard for adjudicating competing rights claims is known as the "preferential option." In other words, in assessing human rights issues the preference should be given those human beings who are most vulnerable to harm, and therefore, in the case of fish consumption standards the option should favor tribal people and in particular infants, children, pregnant women, and the elderly within that population.

In the final outcome of the Oregon decision we have a conflicted ethical conclusion. On one hand the adopted fish consumption standard of 175 grams per day is far more protective than the former standard of 17.5 grams per day. The new standard is more protective of a vulnerable population because of the importance of fish in their diet; however, the new standard is not protective of the most vulnerable, and consequently the situation of environmental injustice remains. Until Oregon and the entire U.S. policymaking apparatus for calculating cancer exposure risk take into account the mounting research on childhood

exposure and potential for irreversible harm, we as a nation will continue to see the violation of human rights and the common well-being of all will remain elusive.

The process of reviewing water quality standards took 12 years, and during this time vulnerable people were exposed to high contaminant levels as a matter of daily course. With the adoption of the new standards based on 175 grams per day of fish consumption, Oregon presently has the strongest water quality standards for surface water contaminants in the United States. Washington still has a standard of 6.5 grams per day fish consumption, and is now beginning a review process. Idaho proposed a standard of 17.5 grams per day to the U.S. EPA, but the U.S. EPA delayed action on this until after the Oregon court case, and in 2012 this was rejected by the U.S. EPA and sent back to the state for reconsideration.

While the Oregon drama led to the improvements in Oregon's water quality standards, the outcome is no cause for complacency. Aside from the Food Quality Protection Act of 1996, U.S. legislation in general is not implemented in a manner to protect children, women, and minorities from environmental health dangers. As Schrader-Frechette notes,<sup>49</sup> "because the Safe Drinking Water Act is not fully enforced, the U.S. EPA says that 45 million Americans drink unsafe water. ... According to the U.S. EPA, approximately 56% of estuarine bodies, 45% of lakes, and 35% of rivers and streams in the nation are ... 'unfit' for drinking, swimming, or fish consumption ... one in five U.S. women have blood-mercury levels that violate EPA limits ... The national scenario described by Schrader-Frechette requires ethical scrutiny and points to our duty and obligation to protect the most vulnerable people in our midst. It is a matter of human rights.

### *The Pastoral Letter's Considerations for Community Caretaking*

#### *1. Consider the Common Good*

*In the concept of the common good, community and individual needs take priority over private wants ...*

#### *2. Conserve the Watershed as a Common Good*

*The Columbia River Watershed is home to people and to a variety of other creatures ...*

#### *3. Conserve and Protect Species of Wildlife*

*The presence and health of wildlife is in many ways a sign of the health of our ecosystems, of the well-being of the people and communities dependent on the ecosystems for their livelihood, and of our respect for God's creatures and creation ...*

#### *4. Respect the Dignity and Traditions of the Region's Indigenous Peoples*

*The indigenous peoples have a wealth of spirituality, culture and traditions that call forth a need for appropriate respect and preservation ...*

#### *5. Promote Justice for the Poor, Linking Economic Justice and Environmental Justice*

*The poor suffer more than other segments of the population from job loss, low wages, poor working conditions and environmental degradation ...*

#### *6. Promote Community Resolution of Economic and Ecological Issues*

*Local community members are often most knowledgeable about local ecosystem dynamics ...*

7. *Promote Social and Ecological Responsibility among Reductive and Reproductive Enterprises*  
*Reductive industries extract from the earth goods that are not renewable, such as metals and petroleum ...*
8. *Conserve Energy and Establish Environmentally Integrated Alternative Energy Sources*  
*Energy conservation consciousness has increased in the watershed ...*
9. *Respect Ethnic and Racial Cultures, Citizens and Communities*  
*Our region is blessed with peoples of diverse cultures who, as individual citizens and cohesive communities, enrich the social fabric of our lives while contributing their labor to promote societal well-being ...*
10. *Integrate Transportation and Recreation Needs with Sustainable Ecosystem Requirements*  
*Reliable transportation utilizing airports, highways, waterways and rail- ways is essential to the river region ...*  
*(full text of the Pastoral letter in English, Spanish, and French available at*  
<https://www.wacatholics.org/stay-informed/the-columbia-river-watershed-caring-for-creation-and-the-common-good>*)*

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2. U.S. EPA, Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health, October 2000, <http://water.epa.gov/scitech/swguidance/standards/criteria/health/methodology/index.cfm> (accessed 6 July, 2012). This article is focused on the Ambient Water Quality Criteria for the Protection of Human Health. Other aspects of water quality review are not touched upon here, but include Ambient Water Quality Criteria for the Protection of Aquatic Life, and regulation of Dioxins/Furans/PCBs as a group.
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7. The State of Oregon's water quality standards had last undergone a partial periodic review from 1992 to 1996; however, criteria for toxic pollutants were not part of that review.
8. U.S. EPA, Methodology.
9. In the Roman Catholic Church a pastoral letter is the application of Catholic Social Teaching (also known as the modern Catholic Rights Tradition) to a particular social economic or environmental issue. Such letters can be international, national, or regional. For examples of two national pastoral letters by the U.S. Catholic Bishops, see the following: *Renewing the Earth, An Invitation to Reflection and Action on Environment In Light of Catholic Social Teaching* (1991) and *Global Climate Change: A Plea for Dialogue, Prudence and the Common Good* (2001).
10. Roman Catholic Bishops of the Columbia Watershed, *The Columbia River Watershed, Caring for Creation and the Common Good*, (Columbia River Pastoral Letter Project: Seattle, WA, 2001), p. 18. This pastoral letter is available as a pdf and in printed copy (the preferred format). For more information go to [http://thewscc.org/index.php?option=com\\_content&view=article&id=38&Itemid=67](http://thewscc.org/index.php?option=com_content&view=article&id=38&Itemid=67).
11. See Table 1.1, page H-6, Toxic Compounds Criteria 1999–2003 Water Quality Standards Review Issue Paper prepared by M. Fitzpatrick, ODEQ, available at <http://www.deq.state.or.us/about/eqc/agendas/attachments/may2004/5.20.04.ItemB.AttchH.pdf> (accessed 6 July, 2012).
12. See Table 1.2, p. H-7, Toxic Compounds Criteria 1999–2003 Water Quality Standards Review Issue Paper, prepared by Martin S. Fitzpatrick, ODEQ, [agendas/attachments/may2004/5.20.04.ItemB.AttchH.pdf](http://www.deq.state.or.us/about/eqc/agendas/attachments/may2004/5.20.04.ItemB.AttchH.pdf) (accessed 6 July, 2012).
13. The only Native American included in the ODEQ process was a PAC member of a Tribe living on a short coastal river. The experience of the coastal Tribes is different from that of the Tribes subsistence fishing on the much longer and more heavily polluted Columbia River.
14. The EQC also judges appeals of fines and other actions of ODEQ, and can appoint and dismiss the director of ODEQ.
15. The EQC at that time consisted of Mark Reeve, chair; Lynn Hampton, vice-chair; Deirdre Malarkey; and Ken Williamson. The fifth seat on the EQC was vacant at that time. All EQC meeting minutes are public; the EQC meeting of 20–21 May 2004, when the members eventually were called to act on the DEQ recommendation, can be accessed at <http://www.oregondeq.com/about/eqc/minutes/2004/5.20-21.04.EQCMinutes.htm> (accessed 6 July, 2012).
16. Treaty with the Walla Walla, Cayuse, and Umatilla, 9 June 1855, <http://www.umatilla.nsn.us/treaty.html> (accessed 6 July, 2012).
17. U.S. EPA, Methodology.
18. U.S. EPA Methodology, section 1.6, equations 1.1, 1.2, 1.3.
19. *Ibid.*, sections 1-9 to 1-10.

20. Ibid., section 1-10.
21. Ibid., section 1.6.
22. Ibid., section 2.4.
23. Ibid., section 2.4.
24. N. Bell, "Environmental Injustice Posed by Oregon's Water Quality Standards," *Journal of Environmental Law and Litigation* 20 (2005): 85–109, esp. pp. 86–87.
25. National Environmental Justice Advisory Council, *Fish Consumption and Environmental Justice*, November 2002, available online at [http://www.epa.gov/compliance/ej/resources/publications/nejac/fish-consump-report\\_1102.pdf](http://www.epa.gov/compliance/ej/resources/publications/nejac/fish-consump-report_1102.pdf) (accessed 6 July, 2012).
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28. Ibid., section 2.8.2.
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32. Toxic Compounds Criteria 1999–2003 Water Quality Standards Review Issue Paper prepared by M. Fitzpatrick, ODEQ, p. H-59, available at <http://www.deq.state.or.us/about/eqc/agendas/attachments/may2004/5.20.04.ItemB.AttchH.pdf>
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34. N. Bell, pp. 85–109.
35. Human Health Focus Group, *Human Health Focus Group Report, Oregon Fish and Shellfish Consumption Rate Project*, 2008, <http://www.deq.state.or.us/wq/standards/fishfocus.htm> (accessed 25 July, 2012).
36. Ibid., pp. 39–40.
37. Ibid., p. 28.
38. Ibid., p. 38.
39. A. Matzke, D. Sturdevant, and J. Wigal, *Human Health Criteria Issue Paper, Toxics Rulemaking*, 24 May 2011, <http://www.deq.state.or.us/wq/standards/docs/toxics/humanhealth/rulemaking/HumanHealthToxicCriteriaIssuePaper.pdf> (accessed 6 July, 2012).
40. For more reading on cost-benefit analysis and its problems see Priceless, *On Knowing the Prices of Everything but the Value of Nothing* by Frank Ackerman and Lisa Heinzerling (The

New Press, 2004) and *Poisoned for Pennies, The Economics of Toxics and Precaution* by Frank Ackerman (Island Press, 2008).

41. Kristin Shrader-Frechette, *Taking Action, Saving Lives, Our Duties to Protect Environmental and Public Health* (New York: Oxford University Press, 2007), 119.

42. Then God said, "Let us make humankind in our image, according to our likeness; and let them have dominion over the fish of the sea, and over the birds of the air, and over the cattle, and over all the wild animals of the earth, and over every creeping thing that creeps upon the earth." So God created humankind in his image, in the image of God he created them; male and female he created them. God blessed them, and God said to them, "Be fruitful and multiply, and fill the earth and subdue it; and have dominion over the fish of the sea and over the birds of the air and over every living thing that moves upon the earth."

43. *Ibid.*, pp. 120–121.

44. Human Health Focus Group, *Human Health Focus Group Report, Oregon Fish and Shellfish Consumption Rate Project*, 2008, p. 28.

45 *Ibid.*, p. 36.

46. Four kg is actually 8.8 lbs rather than 8 lbs as this quote converts the units

47 *Ibid.*, p. 36.

48 *Ibid.*, p. 36.

49 Kristin Shrader-Frechette, p. 20.