

**PUBLISHED**

**UNITED STATES COURT OF APPEALS  
FOR THE FOURTH CIRCUIT**

DOW AGROSCIENCES LLC;  
MAKHTESHIM AGAN OF NORTH  
AMERICA, INC.; CHEMINOVA, INC.  
USA,

*Plaintiffs-Appellants,*

v.

NATIONAL MARINE FISHERIES  
SERVICE; JAMES W. BALSIGER,  
Acting Assistant Administrator of  
the National Marine Fisheries  
Service; NORTHWEST CENTER FOR  
ALTERNATIVES TO PESTICIDES;  
PACIFIC COAST FEDERATION OF  
FISHERMEN'S ASSOCIATIONS;  
INSTITUTE FOR FISHERIES RESOURCES;  
DEFENDERS OF WILDLIFE,

*Defendants-Appellees.*

CROPLIFE AMERICA,

*Amicus Supporting Appellants.*

No. 11-2337

Appeal from the United States District Court  
for the District of Maryland, at Greenbelt.  
Alexander Williams, Jr., District Judge.  
(8:09-cv-00824-AW)

Argued: October 24, 2012

Decided: February 21, 2013

2      DOW AGROSCIENCES v. NATIONAL MARINE FISHERIES

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Before NIEMEYER, SHEDD, and AGEE, Circuit Judges.

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Reversed, the agency's biological opinion vacated, and the case remanded by published opinion. Judge Niemeyer wrote the opinion, in which Judge Shedd and Judge Agee joined.

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### COUNSEL

**ARGUED:** Christopher Landau, KIRKLAND & ELLIS, LLP, Washington, D.C.; David Burton Weinberg, WILEY REIN, LLP, Washington, D.C., for Appellants. Mark R. Haag, UNITED STATES DEPARTMENT OF JUSTICE, Washington, D.C.; Stephen Daniel Mashuda, EARTHJUSTICE, Seattle, Washington, for Appellees. **ON BRIEF:** Aaron Nielson, KIRKLAND & ELLIS, LLP, Washington, D.C.; Elbert Lin, Eric Andreas, WILEY REIN, LLP, Washington, D.C.; David Menotti, Warren U. Lehrenbaum, CROWELL & MORING LLP, Washington, D.C., for Appellants. Robert G. Dreher, Acting Assistant Attorney General, Meredith Flax, UNITED STATES DEPARTMENT OF JUSTICE, Environment & Natural Resources Division, Washington, D.C.; Pamela B. Lawrence, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, Silver Spring, Maryland, for Appellees National Marine Fisheries Service and James W. Balsiger. Amanda W. Goodin, EARTHJUSTICE, Seattle, Washington, for Appellees Northwest Center for Alternatives to Pesticides, Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources, and Defenders of Wildlife. William K. Rawson, Claudia M. O'Brien, Stacey L. VanBelleghem, LATHAM & WATKINS LLP, Washington, D.C., for Amicus Supporting Appellants.

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**OPINION**

NIEMEYER, Circuit Judge:

In this appeal, we decide whether a "biological opinion" ("BiOp") issued by the National Marine Fisheries Service ("Fisheries Service" or "the Service") to the Environmental Protection Agency ("EPA") is arbitrary and capricious under the Administrative Procedure Act, 5 U.S.C. § 706. The BiOp, which the Fisheries Service provided as part of the EPA's process of reregistering the pesticides chlorpyrifos, diazinon, and malathion, concluded that these pesticides would jeopardize the viability of certain Pacific salmonids and their habitat and that the pesticides could not be reregistered and therefore used without substantial restriction.

Three manufacturers of these pesticides commenced this action, challenging the BiOp by contending that it rested on numerous unsupported assumptions and conclusions and faulty analyses and that therefore it was arbitrary and capricious. The district court, unpersuaded, granted the Fisheries Service's motion for summary judgment, finding that the BiOp was rationally supported by the "voluminous facts and studies considered by the [Fisheries Service]."

On appeal, we reverse, concluding that the BiOp was not the product of reasoned decisionmaking in that the Fisheries Service failed to explain or support several assumptions critical to its opinion. To enable a renewed agency process, we vacate the BiOp and remand this case to the district court with instructions to remand it to the Fisheries Service for further proceedings consistent with this opinion.

I

Dow AgroSciences LLC, Makhteshim Agan of North America, Inc., and Cheminova, Inc. USA (collectively, "Pesticide Manufacturers" or "Manufacturers") hold EPA registra-

tions for the pesticides chlorpyrifos, diazinon, and malathion. Under the Federal Insecticide, Fungicide, and Rodenticide Act ("FIFRA"), pesticide products must be registered with the EPA before they can be distributed or sold. 7 U.S.C. § 136 et seq. Once a product is registered, "[a] registrant may distribute or sell [the] registered product with the composition, packaging and labeling currently approved by the [EPA]." 40 C.F.R. § 152.130(a). To ensure that registrations are up to date, 1988 amendments to FIFRA required the EPA to reregister any pesticide that was first registered before November 1, 1984. 7 U.S.C. § 136a-1(a). In reregistering products, the EPA must examine data to determine whether the pesticides still meet FIFRA's requirements, including the requirement that the pesticide perform without "unreasonable adverse effects" on the environment.

Chlorpyrifos was first registered in 1965; diazinon, in 1956; and malathion, in 1956. Therefore, these pesticides had to be reregistered for use because of the 1988 amendments to FIFRA.

As an agency "action," the reregistration of pesticides by the EPA is subject to the requirements of the Endangered Species Act, which provides that every federal agency must "insure" that its actions are "not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat" deemed critical to such species. 16 U.S.C. § 1536(a)(2). If an agency's proposed action is likely to affect an endangered species, the agency must consult with the Secretary of the Interior, acting through either the Fisheries Service or the U.S. Fish and Wildlife Service, to obtain an opinion evaluating the agency's action under the Endangered Species Act. *Id.* § 1536; 50 C.F.R. §§ 402.01, 402.14. As part of the consulting process, the consulted agency issues a BiOp that explains whether the agency's proposed action "is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical

habitat." 50 C.F.R. § 402.14(g)(4), (h). And in issuing the BiOp, the consulted agency, whether it be the Fisheries Service or the U.S. Fish and Wildlife Service, must use "the best scientific and commercial data available." 16 U.S.C. § 1536(a)(2).

In reregistering chlorpyrifos, diazinon, and malathion, the Pesticide Manufacturers and the EPA agreed on steps to reduce the volume of those pesticides being used. Among other measures, the Manufacturers agreed to voluntarily phase out chlorpyrifos for residential use and phase in buffer zones, reduced application rates, and other restrictions for that pesticide. Additionally, they agreed to curtail the use of diazinon and malathion so as to eliminate homeowner use of diazinon and reduce application rates of malathion. In this reregistering process, however, the EPA did not consult or confer with the Secretary of the Interior to obtain a BiOp under the Endangered Species Act.

In January 2001, several environmental groups filed suit against the EPA in the Western District of Washington, alleging that the EPA failed, as required, to consult with the Secretary of the Interior with respect to the reregistration of 55 active ingredients in pesticides. The district court agreed with the groups and ordered the EPA to determine whether it was necessary to consult with the Secretary of the Interior. *Wash. Toxics Coalition v. EPA*, Civ. No. 01-132, 2002 WL 34213031 (W.D. Wash. July 2, 2002), *aff'd*, 413 F.3d 1024 (9th Cir. 2005). Thereafter, the EPA evaluated the effects of the pesticide ingredients; concluded that 37 active pesticide ingredients, including chlorpyrifos, diazinon, and malathion, might "affect" specific salmonid species and their habitats; and consequently initiated a formal consultation with the Fisheries Service.

When, after a long delay, the Fisheries Service had failed to issue a BiOp, an environmental group filed a second suit, again in the Western District of Washington, to require the

Fisheries Service to issue its BiOp. See *Northwest Coalition for Alternatives to Pesticides v. Nat'l Marine Fisheries Serv.*, Civ. No. 07-1791 (W.D. Wash. Nov. 5, 2007). The Fisheries Service settled this suit on July 30, 2008, agreeing to issue a BiOp within 90 days. A day after the settlement agreement, the Fisheries Service delivered a 389-page *draft* BiOp to the EPA, in which the Service proposed to conclude that chlorpyrifos, diazinon, and malathion would "jeopardize the continued existence" of 28 Pacific salmonid species and impact 26 critical habitats. The EPA also opened an online docket on August 14, 2008, to permit comments in response to the draft BiOp.

The EPA itself, as well as the Pesticide Manufacturers, several States, and others, responded to the draft BiOp, criticizing many of its assumptions and much of its analysis. The EPA noted that "[t]he Draft lacks a level of transparency necessary for EPA to understand [the Fisheries Service's] rationale for its opinion that the use of any of these pesticides will jeopardize the continued existence of any of the species at issue." The EPA identified a number of specific problems, including the Fisheries Service's failure to consider already in-place mitigation measures; the Fisheries Service's assumption that pesticides would be applied unlawfully; the Fisheries Service's use of historical data; and the Fisheries Service's critical assumption in its model that the subject species would be exposed to a lethal level of pesticides on a continual basis for a four-day period.

In response to comments, the Fisheries Service revised its draft, adding information on in-place pesticide-use reductions and supplementing its original data with additional studies. It issued a final BiOp on November 18, 2008, now some 482 pages, in which it still concluded that chlorpyrifos, diazinon, and malathion would jeopardize numerous salmonid species and adversely affect critical habitat for them. It found that exposure to these pesticides would kill salmonids and, even at low levels, would reduce salmonid growth, reduce the

availability of prey, and impair salmonids' swimming and olfactory senses. And it found ultimately that the reregistration of the pesticides would jeopardize the survival of 27 of 28 listed salmonid species and adversely affect the critical habitat of 25 of 26 listed species.

As required by applicable regulations, the Fisheries Service recommended "reasonable and prudent alternatives" that "would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat." 50 C.F.R. § 402.02. To that end, the Fisheries Service recommended imposing: (1) a requirement to create specific "buffers" in which pesticides could not be used; (2) limitations on applying pesticides in high winds; (3) a requirement to create a 20-foot strip of vegetation near surface waters connected to salmonid habitats; (4) monitoring and regular reporting concerning salmonid mortality; and (5) limitations on applying pesticides when soil moisture is, or is likely to become, high.

Following the Fisheries Service's issuance of its final BiOp, the Pesticide Manufacturers commenced this action under the Administrative Procedure Act, 5 U.S.C. § 704, alleging that the Fisheries Service's BiOp was arbitrary and capricious and that the Service did not comply with the Endangered Species Act's mandate to use the "best scientific and commercial data available." On the Fisheries Service's motion, the district court entered an order dismissing the Manufacturers' complaint on the ground that, pursuant to FIFRA, the BiOp was judicially reviewable only after the EPA issued a final reregistration order. *Dow AgroSciences LLC v. Nat'l Marine Fisheries Serv.*, 638 F. Supp. 2d 508, 513 (D. Md. 2009). On appeal, we reversed and remanded the case, concluding that the BiOp was indeed a final agency action subject to judicial review. *Dow AgroSciences LLC v. Nat'l Marine Fisheries Serv.*, 637 F.3d 259, 260-61 (4th Cir. 2011).

On remand, the parties filed cross-motions for summary judgment. In connection with its motion, the Fisheries Service submitted an explanatory affidavit from Anthony Hawkes, a toxicologist at the Fisheries Service, in which he discussed the sources of data and information that the Service considered and rebutted a number of arguments that the Pesticide Manufacturers had made in their motion for summary judgment. The Manufacturers objected to the Hawkes affidavit, contending that it contained improper post-hoc rationalizations for the Fisheries Service's BiOp.

In an opinion dated October 31, 2011, the district court rejected the Pesticide Manufacturers' challenge to the Hawkes affidavit and, on the merits, granted summary judgment to the Fisheries Service. While the court conceded that the Hawkes affidavit provided "an explanation not already given in the administrative record," it nonetheless found that the explanations did not "constitute post-hoc rationalizations because they stem[med] from information provided in the administrative record." In granting summary judgment to the Fisheries Service, the court concluded that there was a "rational connection between the voluminous facts and studies considered by the [Fisheries Service] and the decisions reached in the [Fisheries Service's] final BiOp." Acknowledging that the BiOp was of "less than ideal clarity," the district court nonetheless concluded that the Pesticide Manufacturers had not "shown that the [Fisheries Service] ignored the best scientific and commercial data available or that the [Fisheries Service's] conclusions [were] irrational."

This appeal followed.

## II

As a threshold matter, the Pesticide Manufacturers contend that the district court erred "by permitting [the Fisheries Service] to supplement the record and fill gaps in the BiOp with post hoc justifications, including arguments by counsel and a



declaration from agency staff." They fault the district court for relying on "new justifications provided solely by counsel" in the judicial review process, pointing out that the district court relied on counsel's purportedly new explanations for (1) the Fisheries Service's assumption that salmonids will be exposed to pesticides continuously for 96 hours; (2) the Fisheries Service's modeling assumption that one-size-fits-all when imposing buffers; and (3) the Fisheries Service's reliance on water monitoring data developed during a period when pesticides were more heavily used. The Manufacturers also fault the district court for relying on the Hawkes affidavit, which they argue provided new justifications and facts not contained in the agency record.

In response, the Fisheries Service contends that the arguments of counsel and the Hawkes affidavit were simply "post-decision explanation[s] supported by citations to the administrative record."

The principles applicable to this issue are well established. In reviewing agency action, a court may not "intrude upon the domain which Congress has exclusively entrusted to an administrative agency." *SEC v. Chenery Corp.*, 318 U.S. 80, 88 (1943). Thus, a court must only consider the record made before the agency at the time the agency acted. *Citizens to Preserve Overton Park v. Volpe*, 401 U.S. 402, 420 (1971). The agency record does not refer simply to the facts presented to the agency but also includes the reasons given by the agency for taking the action. And a reviewing court may look only to these *contemporaneous* justifications in reviewing the agency action. *Chenery*, 318 U.S. at 87-88. As such, facts and justifications for agency action provided to a reviewing court for the first time are generally not to be considered by the court. *See, e.g., Motor Vehicle Mfr. Ass'n v. State Farm Auto. Ins. Co.*, 463 U.S. 29, 50 (1983) ("[C]ourts may not accept appellate counsel's *post hoc* rationalizations for agency action").

In this case, the district court explicitly found that the Fisheries Service's BiOp did not include adequate explanations in at least two critical areas. First, the court concluded that "the [Fisheries Service] provide[d] scant explanation for [its] assumption in the BiOp" that salmonids would be exposed to lethal levels of the pesticides continuously for a 96-hour period. Nonetheless, the court upheld the Fisheries Service's assumption, crediting an argument made by the Fisheries Service's summary judgment brief that the 96-hour exposure assumption was not the final step in the Fisheries Service's analysis.

Second, the district court concluded that "the BiOp does not explain why the buffers it requires do not vary according to channel depth and width." Nonetheless, the court again upheld the uniform buffers requirement, relying on an argument made by counsel during the summary judgment process that "uniform buffers are the industry standard."

In short, even though the district court recognized that the BiOp was infirm in two critical respects, it inappropriately overlooked the infirmity based not on the record, but on justifications provided by counsel during the judicial proceedings. Thus, the court erred in failing to confine itself to a review of the agency record.

As to the Hawkes affidavit, the Pesticide Manufacturers argue that it impermissively expanded the agency's record by providing justifications, explanations, and facts not relied on by the Fisheries Service in its BiOp. Again we agree with the Manufacturers' argument.

In *Overton Park*, the Supreme Court noted that litigation affidavits generally amount to post-hoc rationalizations that have "traditionally been found to be an inadequate basis for review." *Overton Park*, 401 U.S. at 419. But a court may, in rare circumstances, consider such materials. For example, in *Overton Park*, the Court recognized that a reviewing court

could require the administrative officials who participated in the decision to give testimony explaining their action. *Id.* at 420. But it did so in the circumstances where the Court had *no administrative record* from which to evaluate the agency's decision in the case. *See id.* at 408. This contextual limitation was further refined by the Court in later decisions when it noted that affidavits not contained in the agency record are permissible only where "there was such failure to explain administrative action as to frustrate effective judicial review." *Camp v. Pitts*, 411 U.S. 138, 142-43 (1973). And the Court recognized that the more generally applicable rule is "to remand to the agency for additional investigation or explanation." *Fla. Power & Light Co. v. Lorion*, 470 U.S. 729, 744 (1985).

Here, where the Fisheries Service provided a 482-page BiOp, it can hardly be argued that the administrative record was so lacking in explanations as to necessitate reliance on a litigation affidavit in conducting judicial review. *See Camp*, 411 U.S. at 142-43. We therefore conclude that the district court erred in receiving and considering the Hawkes affidavit.

Additionally, the district court would probably have erred in receiving the Hawkes affidavit even in the limited circumstances approved in *Overton Park* because Hawkes did not explain how he had authority to speak on behalf of the Fisheries Service to explain or justify its decisions. He stated only that he was "a toxicologist for the National Marine Fisheries Service," who had helped write the BiOp.

For these reasons, we will review the Fisheries Service's action in this case—its BiOp of November 18, 2008—on the basis of the agency record before the district court, disregarding the justifications and rationalizations given to the district court by counsel and by the Hawkes affidavit.

### III

The Pesticide Manufacturers contend, on the merits, that the Fisheries Service's BiOp failed to justify numerous criti-

cal components of its analysis, rendering the BiOp substantially arbitrary and capricious. Rather than address each claimed deficiency, we address what we consider to be their three most significant claims: (1) that the Fisheries Service failed to justify its model's assumption that juvenile salmonids would be exposed to a lethal level of pesticides continuously for 96 hours; (2) that the BiOp fails to justify its reliance on water monitoring data that the Manufacturers allege were outdated and not representative of current conditions; and (3) that it failed to explain why it imposed uniformly sized buffers to all bodies of water, whether they be rivers or drainage ditches, and regardless of the economic feasibility of such uniform buffers.

In reaching the conclusions made in the BiOp, the Fisheries Service considered numerous studies and data to analyze (1) the levels of pesticide exposure that the salmonids were likely to experience; (2) the individual salmonid's likely response to those exposures; and (3) the likely consequences of that exposure to the population of the relevant salmonid species. Upon completing these analyses, the Fisheries Service concluded that the pesticides chlorpyrifos, diazinon, and malathion were likely to jeopardize the continued existence of 27 salmonid species and destroy or adversely modify the critical habitat of 25 of the species.

Important to the Fisheries Service's analysis and conclusions was a population model that sought to extrapolate the effects on individual salmonids to an entire population of those salmonids. The model assumed that salmonids would be exposed to lethal levels of the pesticides continuously for a 96-hour period. The BiOp explained that the 96-hour exposure assumption was a laboratory standard: "A large body of laboratory toxicity data indicates that anadromous salmonids die following short term (< 96 h) exposure to the three insecticides," defining the standard as an "acute test." The BiOp then explained its use of this acute test:

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An acute toxicity model was constructed that estimated the population-level impacts of juvenile mortality resulting from exposure to lethal concentrations of chlorpyrifos, diazinon, and malathion. These models excluded sublethal and indirect effects of the pesticide exposures and *focused on the population-level outcomes resulting from an annual 4-day exposure to juveniles to chlorpyrifos, diazinon, or malathion.*

(Emphasis added). Using the model that applied the acute test, the BiOp thus found:

These results indicate that salmonid populations exposed to chlorpyrifos, diazinon, or malathion for 4 days at the reported LC50s [a lethal concentration sufficient to kill 50% of the test population] would have severe consequences to the population's growth rate.

But then, without explaining why the 96-hour exposure assumption accurately reflected real-world conditions, the BiOp concluded that "all but Ozette Sockeye populations . . . will experience reductions in viability, which ultimately reduces the likelihood of survival and recovery of these species."

Also important to the Fisheries Service's conclusions (especially with respect to the level of pesticide exposure) was the water monitoring study conducted by the U.S. Geological Survey during the period from 1992 to 2006. That study tested water samples from streams across the United States and found that chlorpyrifos was present in 26% of the samples, diazinon in 40%, and malathion in 6%. Based primarily on that study, even though it also considered other more limited data, the BiOp concluded:

Pacific salmon and steelhead use a wide range of freshwater, estuarine, and marine habitats and many

migrate hundreds of miles to complete their lifecycle. Chlorpyrifos, diazinon, and malathion are widely used pesticides and their detection is common in freshwater habitats within the four western states where listed specific salmonids are distributed. Therefore, we expect some individuals within all the listed Pacific salmon and steelhead [evolutionary significant units] will be exposed to these chemicals and other stressors of the action. *Concentrations of chlorpyrifos, diazinon, and malathion can occur at levels well over 100 ug/l and upwards of 1000 ug/l based on measured environmental concentrations and exposure models.*

(Emphasis added).

After the BiOp reached its ultimate conclusion that chlorpyrifos, diazinon, and malathion were likely to jeopardize the viability of 27 species of salmonids, it turned, as it was required to do, to recommending "reasonable and prudent alternatives" in using the pesticides. In this case, the alternatives limited the scope of the pesticides' use and required monitoring and reporting. In the recommended limitations of use, the BiOp required that the pesticides not be used in ground applications within 500 feet and in aerial applications within a 1000 feet of "salmonid habitats," "intermittent streams" that connect to salmon-bearing waters, and "all known types of off-channel habitats as well as drainages, ditches, and other manmade conveyances to salmonid habitats that lack salmonid exclusion devices."

The Pesticide Manufacturers contend that the Fisheries Service's BiOp was deficient, among other ways, in (1) failing to provide support for its 96-hour modeling assumption; (2) relying on the U.S. Geological Survey's water monitoring study; and (3) failing to justify the uniform buffers. We address these points seriatim.

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A. *The 96-Hour Exposure Assumption*

In its BiOp, the Fisheries Service used an analytical model that incorporated an assumption that all "subyearling" juvenile salmonids in the wild are exposed for 96 straight hours to a lethal concentration of the pesticides. It candidly recognized that the 96-hour exposure assumption was derived from a laboratory protocol, but it never explained why the laboratory protocol was appropriately reflective of conditions in the real-world environment. The Pesticide Manufacturers assert that the application of the laboratory standard was the "only 'quantitative' evidence [in the BiOp] that salmonid populations are likely to be affected by the EPA's reregistration of the products at issue."

When the Fisheries Service released its draft BiOp and posted it for comment, the 96-hour exposure assumption was severely criticized. Indeed, the EPA itself argued that the assumption was "unreasonable," particularly given the "infrequency of those concentrations in the [actual] monitoring data sets." The EPA added that the Fisheries Service had "provide[d] no explanation of how [the 4-day exposure assumption] can be characterized as realistic or reasonable." Other commentary made the same point.

Despite this critical commentary, the Fisheries Service added nothing to the final BiOp to respond to it, and the district court acknowledged, as it had to, that the BiOp "provide[d] scant explanation for this assumption." The court, crediting the Service's interpretation, found that the "4-day period is one of the standard periods for acute toxicity testing" in "laboratories under controlled conditions." The district court also observed that if the Fisheries Service

were to rely solely on this four-day test in drawing conclusions about the degree to which actual populations of salmonids are affected, it would have an obligation to explain why such a test, which relies on

laboratory-based assumptions of consistent exposure, serves as a basis for predicting population exposure or survival in the field.

Nonetheless, the court forgave the absence of an explanation because the BiOp stated that the 96-hour exposure standard was only among a host of factors that had to be considered in determining the viability of the salmonid species. The court concluded:

While four days may seem arbitrary to a lay person, it is not the duty of the Court to sit in judgment of scientific standards. The Court also declines to second-guess the [Fisheries Service's] decision to utilize this standard, ordinarily confined to laboratory tests, as part of its larger analysis in determination of population-level effects.

On that basis, the court concluded that the assumption was not arbitrary and capricious. *See* 5 U.S.C. § 706(2)(A).

Yet the district court failed to recognize that the Fisheries Service had to "articulate a 'satisfactory explanation for its action [that demonstrates] a rational connection between the facts found and the choice made.'" *Satellite Broadcasting & Commc'ns Ass'n v. FCC*, 275 F.3d 337, 370 (4th Cir. 2001) (alterations in original) (quoting *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983)). Rather than doing so, the court instead deferred to the agency and failed even to address whether there was any rational connection between the agency's use of the 96-hour laboratory exposure assumption and field conditions.

The Fisheries Service argues that "while the BiOp does not explicitly discuss the basis for the assumption, [the Fisheries Service's] path 'may be reasonably discerned' from the BiOp and the administrative record." In an attempt to show us that path, the Service directs us to four observations scattered



throughout the BiOp, which state (1) that 96 hours is the typical period in "acute toxicity" tests; (2) that because young salmonids use "shallow, low flow habitats at some point in their life cycles," they are exposed to waters that have only a "limited ability to dilute pesticide contamination"; (3) that pesticides can persist in water for longer than 96 hours; and (4) that pesticides are applied multiple times in a single area. Even if we accept that these observations delineate a "path," that path still does not lead to an explanation of why the Service decided that the 96-hour exposure assumption taken from laboratory testing was the appropriate proxy for real-world conditions. The fact remains that the Fisheries Service postulates an environment where salmonids are exposed to *lethal* levels of pesticides *continuously* for *96 hours* based on a laboratory protocol without explaining how the assumption matches up with real-world conditions.

In an attempt to save the assumption, the Fisheries Service argues that because its BiOp "candidly recognizes the limitations of this modeling," its disclosure of limitations justifies using the 96-hour exposure assumption. But acknowledging a model's limitations does not go to explaining why it was chosen and the rationality of its relationship to real-world conditions. If anything, an acknowledgement that the assumption is flawed would seem to necessitate more explanation of why the assumption was used.

At bottom, we conclude that the Fisheries Service's failure to explain why it used the 96-hour exposure assumption renders the BiOp arbitrary and capricious.

#### B. *The Water Monitoring Data*

The Pesticide Manufacturers next challenge the BiOp's reliance on purportedly outdated water monitoring data, which were the only type of data used in the BiOp to describe field conditions. The principal source of the data used by the Fisheries Service was a National Water-Quality Assessment

conducted by the U.S. Geological Survey from 1992 to 2006, in which the U.S. Geological Survey tested water samples from hundreds of streams across the United States. Using those data, the Fisheries Service reported high concentration levels of chlorpyrifos, diazinon, and malathion in relevant waterways.

When the draft BiOp was released for comment, the Pesticide Manufacturers, as well as many other commentators, promptly noted the flaws in the U.S. Geological Survey data and directed the Fisheries Service to more recent available data. The EPA explained to the Fisheries Service that the "historical data [in the draft BiOp] more appropriately reflect[ed] pesticide use prior to substantive mitigation that ha[d] been put in place by EPA." The States of Idaho, California, and Washington also provided references to more recent data, demonstrating that the U.S. Geological Survey data were outdated.

In the final BiOp, the Fisheries Service continued to rely on the older U.S. Geological Survey data. Indeed, the BiOp acknowledged the data's deficiency but did not address it. It stated that "reduced rates are likely to result in corresponding reductions in exposure"; that the older data may not be representative of "current and future pesticide uses and conditions"; and that "recent data show a decrease in use of chlorpyrifos and diazinon in California that may be associated with restrictions on residential uses of those active ingredients." But ultimately, the Fisheries Service continued to rely primarily on the U.S. Geological Survey sampling data.

The Pesticide Manufacturers argue that because the older data do not reflect the "use cancellations, usage rate reductions, and protective application techniques required by the EPA's re-registration process," the data were nonrepresentative and any reliance on them was arbitrary and capricious.

Although we do not address how representative the U.S. Geological Survey data continue to be, we do note that the

BiOp never adequately explained why it relied on older data despite the existence of new data and the potential drawbacks of using the older data. The Fisheries Service argues that it was nonetheless justified in using the older water monitoring data because the BiOp (1) acknowledged the cancelled uses and decreases in pesticides in California; (2) observed that the mitigation measures did not mean that pesticide use necessarily changed, as old stockpiles of pesticides were still being used that were labeled with the less restrictive registrations; (3) noted that any effect of the use of cancellations and application reductions on exposure levels was uncertain because of the lack of relevant data; and (4) took into account the various criticisms when it acknowledged that the water monitoring data might not be representative of the current and future use of these pesticides.

But these observations in the BiOp do not alleviate the concerns that the Manufacturers raise and that we share. Each of the Fisheries Service's arguments goes to its effort to bolster the reliability of the data that it actually used, but not one of the explanations addresses the issue of why the Fisheries Service relied on these old data when new data were available. To be sure, the Fisheries Service need not have analyzed or explicitly rejected every data source presented, but it surely was required to "cogently explain why it ha[d] exercised its discretion" in relying on a data set that was so highly criticized. *State Farm*, 463 U.S. at 48.

We should point out that an agency need not revise its action every time new data or a new model is announced because doing so "would lead to significant costs and potentially endless delays in the approval processes." *Sierra Club v. EPA*, 356 F.3d 296, 308 (D.C. Cir. 2004) (concluding that the EPA's approval of State plans that used an old model was appropriate where a new modeling tool was available for only one year before the EPA approved the plans). But when an agency acknowledges that its data are either outdated or inaccurate, it should, at the very least, analyze the new data or

explain why it nevertheless chose to rely on the older data. *See, e.g., Sierra Club v. EPA*, 671 F.3d 955, 966-68 (9th Cir. 2012) (finding the EPA's action arbitrary and capricious for not utilizing a more recent model). As the Ninth Circuit explained, "we should not silently rubber stamp agency action that is arbitrary and capricious in its reliance on old data without meaningful comment on the significance of more current compiled data." *Id.* at 968.

Here, we face just that situation. The Fisheries Service recognized that it was relying on outdated data and that it had been presented with more recent data, but it chose to continue relying on the outdated data without explaining why.

### C. *The Prescribed Use of Uniform Buffers*

Because the Fisheries Service found that the reregistration of chlorpyrifos, diazinon, and malathion would jeopardize salmonid populations, it was obligated to recommend "reasonable and prudent alternatives, if any." 50 C.F.R. § 402.14(h)(3); *see also* 16 U.S.C. § 1536(b)(3)(A). In this case, the Fisheries Service recommended, among other things, that ground applications of the pesticides be prohibited within 500 feet and aerial applications be prohibited within 1,000 feet of "salmonid habitats," "intermittent streams" that connect to salmon-bearing waters, and "all known types of off-channel habitats."

The Pesticide Manufacturers contend that the prescription of such fixed buffer zones is unreasonable in view of the variable water environments throughout the Pacific Northwest. And they assert that because buffers were aimed at protecting only the most sensitive, off-channel salmonid habitats, the Service was obligated to explain why that same buffer zone should apply to larger bodies of water. In addition, the Manufacturers contend that the BiOp failed to explain, as required by law, the economic feasibility of the one-size-fits-all buffers.

It is not disputed that the BiOp fails to address why the buffers do not vary according to channel depth and width. Indeed, the district court so found, noting that "the BiOp does not explain why the buffers it requires do not vary according to channel depth and width, and the [Pesticide Manufacturers'] suggestion appeals to common sense." The district court, however, accepted the single-size buffers because counsel for the Fisheries Service asserted, without providing further justification, that uniform buffers were the industry standard.

To be sure, the BiOp did address the fact that some form of buffer was appropriate as a "recognized tool[ ] to reduce pesticide loading into aquatic habitats from drift." And large buffers are appropriate where the pesticides could drift to "off-channel habitats" because these off-channel habitats, serving as a nursery for young salmonids, are particularly vulnerable. But while this explanation supports the use of buffers, it does not explain why buffers designed to protect "off channel habitats" should also apply to protect large, flowing rivers.

In response, the Fisheries Service argues that the Endangered Species Act does not require the Fisheries Service "to explain why [it] chose one recommended and prudential alternative over another," relying on and quoting from *Southwest Center for Biological Diversity v. U.S. Bureau of Reclamation*, 143 F.3d 515, 523 (9th Cir. 1998). But *Southwest Center* does not address the problem here. In that case, the court found that the agency did not have to explain why it chose one reasonable and prudent alternative over another *when both were sufficiently justified* in the report itself. *See id.* Here, *uniform* buffers were the only alternative included in the BiOp, and the Fisheries Service did not explain why it was appropriate.

The absence of a justification becomes especially relevant in view of the potential economic consequences of such a requirement and the mandate that reasonable and prudent

alternatives be "economically and technologically feasible." 50 C.F.R. § 402.02. Every recommended alternative must be a measure that "can be taken by the Federal agency or applicant in implementing the agency's action." 16 U.S.C. § 1536(b)(3)(A). And in determining this, the Service must consider several factors, including "economic feasibility." *See* 50 C.F.R. § 402.02 ("Reasonable and prudent alternatives refer to alternative actions identified during formal consultation . . . that [are] economically and technologically feasible").

The Fisheries Service does not claim that it considered economic feasibility or that the BiOp addressed it. Thus, the district court correctly found that "[the Fisheries Service] does not discuss the economic feasibility of the buffers in the BiOp or elsewhere in the administrative record." Rather, the Fisheries Service reads the economic feasibility requirement to be trumped by the statement of the Endangered Species Act's purpose "to halt and reverse the trend toward species extinction, *whatever the cost.*" *TVA v. Hill*, 437 U.S. 153, 184 (1978) (emphasis added). Under the Fisheries Service's reading, the economic feasibility requirement becomes simply a limitation that the reasonable and prudent alternative be economically *possible*, without any need for discussion.

We cannot agree with this position, as it effectively reads out the explicit requirement of Regulation 402.02 that the agency evaluate its reasonable and prudent alternative recommendation for, among other things, economic and technological feasibility. Moreover, economic feasibility becomes especially relevant when recommending uniform buffers because, as the Pesticide Manufacturers point out, pesticide applications would be prohibited within 500 feet (for ground applications) and 1,000 feet (for aerial applications) of *any* waterway that is connected, *directly or indirectly*, at *any* time of the year, to *any* water body in which salmonids *might be* found at *some point*. Such a broad prohibition readily calls for some analysis of its economic and technical feasibility.

We hasten to add that the Fisheries Service "is not required to pick the best option for the industry any more than for the species, [but] it must provide some analysis of the options it selects." *Greenpeace v. Nat'l Marine Fisheries Serv.*, 55 F. Supp. 2d 1248, 1268-69 (W.D. Wash. 1999). By not addressing the economic feasibility of its proposed "reasonable and prudent" alternative providing for one-size-fits-all buffers, the Fisheries Service has made it impossible for us to review whether the recommendation satisfied the regulation and therefore was the product of reasoned decisionmaking. This failure provides another basis for our conclusion that the BiOp was arbitrary and capricious.

#### IV

In sum, the Fisheries Service's November 2008 BiOp relied on a selection of data, tests, and standards that did not always appear to be logical, obvious, or even rational. While the Service may have had good and satisfactory explanations for its choices, the BiOp did not explain them with sufficient clarity to enable us to review their reasonableness. For that reason, we conclude the BiOp is arbitrary and capricious.

In reaching this conclusion, we have addressed what we consider to be the more obvious flaws, but others are claimed to exist. We have not addressed all of the Pesticide Manufacturers' complaints because, on remand, they can be aired and addressed in the renewed agency process. We find it sufficient at this point to vacate the BiOp in its present form and require the Fisheries Service to address not only the flaws we identified but also any additional matters that may be raised on remand.

Accordingly, the judgment of the district court is reversed; the BiOp is vacated; and the case is remanded to the district court with instructions to remand the case to the Fisheries Service for further proceedings consistent with this opinion.

*IT IS SO ORDERED.*