

**WATER QUALITY CONFLICT RESOLUTION AND
AGRICULTURAL DISCHARGES: LESSONS FROM
*WATERKEEPER V. HUDSON***

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INTRODUCTION

The *Waterkeeper Alliance, Inc. v. Hudson et al.*¹ case garnered intense public scrutiny,² in part for its precedent-setting potential, whereby the poultry industry could assume liability for agricultural pollution associated with litter and its land application.³ At first glance, the case outcome simply appeared that industrial agriculture prevailed against attack from environmental groups. However, when comparatively analyzed in terms of institutions and societal goals, the *Hudson* case reveals that the lesson is far more complex. More importantly, the comparative institutional analysis leads directly to policy prescriptions that can improve water-land nexus conflict resolution. This Article argues that the judicial process is poorly positioned to resolve this conflict—relative to other resolution processes—and other processes would be more likely for environmental groups to achieve their goal of improving environmental quality. The judicial process often balances the economic efficiency of competing uses (which, arguably, tip in favor of the agricultural operator targeted by the case), but it is poorly positioned to process this conflict because of unallocated rights remaining in the underlying conflict of interests. The judiciary is poorly positioned to resolve this conflict because, currently, legislatures and agencies (quasi-judicial resolution) offer little guidance on the allocation of rights and duties involving agricultural discharges. Quasi-judicial processes are typically better positioned to resolve highly complex scientific natural resource conflicts⁴ and to assign previously unallocated rights, using legislative rules as guidance, when ecological interdependencies require systematic processing of scientific evidence. However, there are so many agricultural discharge conflicts that future dispute resolution processes will undoubtedly decide more cases in the near future.

¹ *Waterkeeper Alliance, Inc. v. Alan & Kristin Hudson Farm et al.*, 278 F.R.D. 136 (D. Md. 2012) [hereinafter *Hudson*].

² Ian Urbina, *School Law Clinics Face a Backlash: As They Go After Powerful Interests, Lawmakers Get Involved*, NEW YORK TIMES (Apr. 4, 2010), http://www.nytimes.com/2010/04/04/us/04lawschool.html?pagewanted=all&_r=0, archived at <http://perma.cc/42QV-SGCG>.

³ David A. Fahrenthold, *Perdue, Poultry Farm Sued for Polluting Chesapeake Bay*, THE WASHINGTON POST (Mar. 2, 2010), <http://www.washingtonpost.com/wp-dyn/content/article/2010/03/02/AR2010030202408.html>, archived at <http://perma.cc/2YFR-PBZQ>.

⁴ Joshua M. Duke & Laura A. Csoboth, *Increased Scientific Capacity and Endangered Species Management: Lessons from the Red Wolf Conflict*, DRAKE J. AGRIC. L. 539, 539-90 (2003).

This Article presents a comparative institutional analysis of an increasingly important type of environmental conflict—the agricultural-waste-discharge and water-land-nexus conflict—using the recent citizen suit *Waterkeeper v. Hudson*⁵ as a case study. The objective is to assess the resource allocation efficiency and procedural fairness of the dispute processing in *Hudson*. The *Hudson* setting involves substantial scientific complexity, including ecological interdependencies, unobservable and observable land management decisions, pollutant transport, in-stream removal, and the problem of multiple and diverse sources of water quality pollution. Although the Hudson farm does fall under a regulated point source category in a state legislative definition, not all agricultural practices on the property are regulated. *Hudson* and other cases⁶ are demanding clearer definition of rights allocated and duties assigned in the water-land nexus conflict.

One part of the argument is that the *Hudson*⁷ case is important but not for the reasons articulated in popular press coverage.⁸ The case itself—as opposed to the broader conflict or agricultural nutrient pollution—is at best an anomaly holding little precedential insight. At worst the case led to a judicial opinion that took a severe tone and that led some to see the case as an unredeemed waste of time and resources.⁹ The comparative

⁵ *Waterkeeper*, 278 F.R.D. at *1.

⁶ *Concerned Area Residents for the Env't v. Southview Farm*, 34 F.3d 114 (1994); *Alt v. EPA*, 2013 4520030 (N.D. W. Va.), 76 ERC 2004. In *Alt*, the court clarified that a CAFO is not an “industrial” operation and that stormwater in a farm yard is agricultural stormwater exempt from permit regulation. The key difference in the *Alt* and *CARE* cases hinged on precipitation, in *CARE* the discharge was observed in absence of precipitation. These cases show an attempt to expand regulatory authority over agricultural discharges through stormwater criteria or industrial classification. These cases are important in that they continue to define Congressional intent. Statute is clear and discharges associated with CAFOs are not allowed outside of the NPDES permit and discharge associated with precipitation is exempt.

⁷ *Waterkeeper*, 278 F.R.D. at *1.

⁸ Kirsten L. Nathanson & David Chung, *Implications Of CWA Violations In Waterkeeper v. Hudson*, CROWELL & MORING LLP LAW 360 (Feb. 11, 2013), <http://www.crowell.com/files/Implications-Of-CWA-Violations-In-Waterkeeper-V-Hudson.pdf>; Timothy B. Wheeler, *Eastern Shore Farmers, Perdue Win Pollution Lawsuit*, THE BALTIMORE SUN (Dec. 20, 2012), <http://articles.baltimoresun.com/keyword/waterkeeper-alliance>, archived at <http://perma.cc/6WBD-JLWC>; Rona Kobell, *Judge Scolds Waterkeepers for Actions in Pollution Suit*, BAY JOURNAL (Apr. 10, 2012), http://www.bayjournal.com/article/judge_scolds_waterkeepers_for_actions_in_pollution_suit, archived at <http://perma.cc/B4QL-C9LF>.

⁹ Walter Olson, *Ruling Discredits UM Law Clinic's Involvement*, BALTIMORE SUN (Dec. 27, 2012), http://articles.baltimoresun.com/2012-12-27/news/bs-ed-hudson-lawsuit-20121227_1_hudsons-waterkeeper-alliance-environmental-law, archived at <http://perma.cc/DF6E-PNZU>.

institutional analysis of the *Hudson* conflict shows that, although all resolution processes are imperfect,¹⁰ the judicial process is not situated to resolve the conflict well and the legislative process is best positioned to achieve societal goals of fairness and efficiency. Moreover, two factors affect a broader analysis of conflicts between agricultural discharges and environmental interests going into the future. First, some key rights to the land-water nexus have been allocated, and, as these are fully formalized, there are progressively fewer rights to allocate. Second, over time, human values of the environment change with increasing scarcity. That is, as awareness of land use intensity and external effects are more prevalent, unallocated rights to low intensity uses become more valuable for environmental interests.¹¹ This implies that recent reliance on quasi-judicial rules to restrict agricultural discharges, rather than legislative action, will lead to more conflicts and less clarity. New legislative guidance is needed on what uses of water resources constitute property rights. In other words, the Clean Water Act has very little to say about nonpoint sources, and this silence will continue to propel conflicts like *Hudson* into courts. Finally, this analysis shows the citizen suit provision in the Clean Water Act¹² did not achieve water protection goals in this case, and the parties that bring similar suits in the future are not well positioned to succeed in the judicial resolution process.

There are five sections of this Article. Part I contains the background of the water-land nexus conflict, set in the Pokomoke Watershed, on the Eastern Shore of Maryland, which led to the *Hudson* case. The historical evidence reveals an increasing scarcity of resources, through enhanced competition among intensive developed and agricultural land uses as well as enhanced calls for environmental protection. Part I concludes that these forces have, inevitably and foreseeably, increased conflict because of the corresponding decrease in capacity of the water-land nexus to absorb, store, and cycle nutrients and bacteria from intensive uses. Part II outlines the comparative institutional analysis method adapted from Komesar¹³ and extended by Duke¹⁴ to assess conflict resolution performance in specific environmental conflicts. Part III explains the data

¹⁰ N. K. KOMESAR, *IMPERFECT ALTERNATIVES: CHOOSING INSTITUTIONS IN LAW, ECONOMICS, AND PUBLIC POLICY* (University of Chicago Press 1994).

¹¹ Terence J. Centner, *Nutrient Pollution from Land Applications of Manure: Discerning a Remedy for Pollution*, 21 STAN. L. & POL'Y REV. 213 (2010).

¹² Federal Water Pollution Control Act, 33 U.S.C. § 1365(a)(1) (1994).

¹³ KOMESAR, *supra* note 10.

¹⁴ Joshua M. Duke, *Institutions and Land-Use Conflicts: Harm, Dispute Processing, and Transactions*, 38 J. ECON. ISSUES 227–52 (2004).

from the *Hudson* case study, which are used to inform the comparative institutional analysis. These data include systematic evidence on each interaction where disputants competed for control over the natural resource and conditional rights were allocated. Part IV applies the comparative institutional analysis to the data. Part V draws implications and conclusions for policy and law.

I. THE WATER-LAND NEXUS BACKGROUND

A. *Pocomoke Watershed and Human Impacts*

For thousands of years prior to the 1600s, the area in southern Delaware and southeastern Maryland was covered in dense vegetation with solid stands of bald cypress and Atlantic white cedar.¹⁵ Tribes of the Algonquin Nation, including the Pocomoke, Nanticoke, and Nassawattox, occupied the riverbanks and were presumably sustained in part by bountiful fish and bivalve populations such as oysters.¹⁶ Beginning in the early 1600s, the native tribes relocated as European colonists moved into the area.¹⁷

As the European colonists populated the Pocomoke Watershed, the use of land and water began to intensify. Oysters were an important food source, but the stock was thought to decline for the first time since human habitation between 1640 and 1690.¹⁸ The early settlers relied on food from the waterways as well as food grown on land and, from 1700 to 1900, Pocomoke Watershed land uses included tobacco and other farms, bog iron mining, and timber felling.¹⁹ Timber production was essential to the early settlers in the late 1700s and early 1800s as swamp cedar was used for “shipbuilding, shingles, siding on homes, water tanks and coffins.”²⁰

¹⁵ Christina Holden, *The Great Cypress Swamp*, THE MARYLAND NATURAL RESOURCE, <http://www.dnr.state.md.us/naturalresource/spring2005/parkiculars.asp> (last visited Mar. 15, 2015), archived at <http://perma.cc/MF45-LQPN>; William S. Sipple, *A Natural History of the Pocomoke River* (1994), <http://sippleenvironmental.com/uploads/X3eTY-7B593559.pdf>.

¹⁶ Henry M. Miller, *The Oyster in Chesapeake History*, HISTORIC ST. MARY'S CITY, <https://www.stmaryscity.org/Archaeology/OysterinChesapeakeHistory.html> (last visited Mar. 15, 2015), archived at <http://perma.cc/F2WQ-T4RK>. One translation of Chesapeake in the Algonquin language is “Great Shellfish Bay.” In the early 1600s early English settlers of the Chesapeake Bay recorded banks of oysters that were so large ships had to take care to avoid them.

¹⁷ Holden, *supra* note 15.

¹⁸ Miller, *supra* note 16.

¹⁹ Sipple, *supra* note 15, at 3.

²⁰ Holden, *supra* note 15.

Shipping of tobacco and lumber encouraged the growth of towns and landings.²¹ By 1850 many of the large trees were gone,²² and by 1930 the swamp forest had been “completely timbered.”²³

Timber clearing affects water quality²⁴ as well as over harvesting of filter feeders such as oysters. Filter feeders obtain food through filtering water and in the process remove (or sequester) nutrients and sediment.²⁵ In the years following the Civil War, around five million bushels of oysters were harvested in Maryland and twenty million bushels were harvested each year at the peak in the mid-1880s.²⁶ In contrast, by 1920, annual takes were from three to five million oysters in the entire Chesapeake Bay, and populations continued to decline into the twentieth century.²⁷ Not only were oysters a food source but they were important to the ecosystem and water quality of the Chesapeake Bay.²⁸ Recent research indicates that oysters have substantial filtration capacity and are able to remove large quantities of nutrients, organic material, and sediment, and oyster stock decline would have had an early influence on the water quality in the Chesapeake Bay.²⁹

B. Maryland's Agricultural History

Maryland's agriculture history was tied to population migration, wars, and expanding transportation. At Maryland's statehood, tobacco farming had depleted soil fertility in certain areas, but crop and animal agriculture continued as a regional food supply for the American Revolution.³⁰ Portions of the population migrated to Baltimore, which was a

²¹ *Id.*

²² Sipple, *supra* note 15, at 4.

²³ Holden, *supra* note 15.

²⁴ Scott H. Ensign & Michael A. Mallin, *Stream Water Quality Changes Following Timber Harvest in a Coastal Plain Swamp Forest*, 35 WATER RES. 3381, 3381–90 (2001).

²⁵ Colleen B. Higgins, Kurt Stephenson, & Bonnie L. Brown, *Nutrient Bioassimilation Capacity of Aquacultured Oysters: Quantification of an Ecosystem Service*, 40 J. ENVTL. QUALITY 271, 271–77 (2011).

²⁶ Miller, *supra* note 16.

²⁷ *Id.*

²⁸ Holden, *supra* note 15.

²⁹ RIE Newell, TR Fisher, RR Holyoke, and JC Cornwell, *Influence of Eastern Oysters on Nitrogen and Phosphorus Regeneration in Chesapeake Bay, USA*, in 47 NATO SCIENCE SERIES: IV EARTH AND ENVIRONMENTAL SCIENCES 93, 94 (R.F. Dame, S. Olenin eds., 2003).

³⁰ *Agriculture in Worcester County*, UNIVERSITY OF MARYLAND EXTENSION, <http://extension.umd.edu/worcester-county/agriculture-worcester-county> (last visited Mar. 15, 2015), archived at <http://perma.cc/E884-CDUV>; *Agriculture Ruled the South*, AMERICAN HISTORY: FROM REVOLUTION TO RECONSTRUCTION AND BEYOND, <http://www.let.rug.nl/usa/outlines>

major port that provided ship building and industrial employment.³¹ During the War of 1812 and the Civil War, food supply was again in high demand and Maryland's agrarian Eastern Shore supported the soldiers with dairy, fruit, and vegetables.³² Livestock production increased after the War of 1812 but declined due to disease after the Civil War.³³ After the Civil War, agriculture on the Eastern Shore intensified from three thousand farms in 1890 to five thousand farms in 1925 as shipping and rail lines began providing access to markets in Philadelphia and the region.³⁴ The farms were greater in number but smaller in acreage, signifying an increase in intensive farming techniques.³⁵ Agriculture was the dominant industry in Maryland until the Great Depression, when farming decreased, but production efficiency gains in farming practices maintained agriculture as a primary industry on the Eastern Shore into the mid-1900s.³⁶

C. *High-Intensity Poultry Farming (Animal Feed Operations or AFOs)*

Agricultural innovations in the mid-1900s, favorable natural resource conditions, and new markets eventually led to the transformation of southern Delaware, eastern Maryland and Virginia (Delmarva) to high-intensity poultry farming.³⁷ Unlike other livestock farming that began industrialized production in the early 1900s, chickens were mainly used for egg production and kept in smaller numbers.³⁸ Some attribute large-scale poultry farming to a hatchery shipping error in 1923 when an Ocean View, Delaware, housewife mistakenly received five hundred chicks instead of fifty chicks.³⁹ However, bird mortality was an issue with early confined

/history-1963/the-colonial-period/agriculture-ruled-the-south.php (last visited Mar. 15, 2015), archived at <http://perma.cc/DS4S-RD8Z>.

³¹ The Eastern Shore Guide, *History of Maryland's Eastern Shore*, EASTERNSHORE.COM, <http://www.easternshore.com/esguide/History.html> (last visited Mar. 15, 2015), archived at <http://perma.cc/Q5MV-VWY5>.

³² See generally *Agriculture in Worcester County*, *supra* note 30.

³³ *Id.*

³⁴ Brooks Miles Barnes, *History of Agriculture on the Eastern Shore from 1870*, EASTERN SHORE NEWS (Jan. 25, 2006), <http://www.esswcd.org/ShoreOutdoorsAgD2.pdf>.

³⁵ *Id.*

³⁶ *Id.*; UMD *supra* note 30.

³⁷ Jerry Adler & Andrew Lawler, *How the Chicken Conquered the World*, SMITHSONIAN HISTORY AND ARCHAEOLOGY (June 2012), <http://www.smithsonianmag.com/ist/?next=/history/how-the-chicken-conquered-the-world-87583657/>, archived at <http://perma.cc/SE4K-K2Y5>.

³⁸ *Id.*

³⁹ Terry Plowman, *Billion-Dollar Poultry Industry Traces its Roots to 1923 Error*, INTERCOM.NET, <http://www.intercom.net/~terrypl/poultry.html> (last visited Mar. 15, 2015).

poultry operations.⁴⁰ Innovations such as antibiotics and vitamin fortified feed⁴¹ and new bird breeds⁴² allowed birds to be confined and grown in large numbers with lower mortality. Birds went from a 16-week growth period to reach 2.2 pounds in 1920 to 5 pounds in seven weeks by 2009.⁴³

Delmarva offered a favorable set of climatic geologic and demographic characteristics for poultry farming as well.⁴⁴ The temperate climate of the region reduced heating costs of enclosures, and the Coastal Plain's sandy soils allowed drainage and reduced diseases carried by water.⁴⁵ Additional advantages included knowledgeable egg farmers, cheap labor from the failing timber industry, and proximity to shipping and rail made getting the poultry to market faster.⁴⁶ By the mid-1950s, supermarkets and fast food chains such as Kentucky Fried Chicken demanded getting chicken to market faster and in higher numbers.⁴⁷ Increased population, faster processing, and vertical integration (from egg to bird to table by one company)⁴⁸ led to intensified, concentrated animal production such as the Hudson Farm example.

Animal feed operations concentrate animals to increase efficiency of supply. The poultry industry uses vertical integration where one company owns most (if not all) of the steps in the production process from egg to market.⁴⁹ Some companies expand to own grain and feed supply or have stakes in breeding and hatchery portions of the market.⁵⁰ The purpose of vertical integration in poultry, as with other industry processes, is to create uniformity in goals, production, and oversight and ultimately reduce costs of production.⁵¹ Integrators such as Perdue Farms, Inc., contract with family-owned business to grow the birds that are received from the integrator

archived at <http://perma.cc/L8ZZ-7SXP>.

⁴⁰ *Id.*

⁴¹ Adler & Lawler, *supra* note 37.

⁴² Kathy Thayer, Kathy Bonham, Nicole Hollingsworth, & Stacy Tate, *The History of the Delaware Chicken*, DELAWARE POULTRY CLUB, <http://thedelclub.webstarts.com/> (last visited Mar. 15, 2015), archived at <http://perma.cc/VZ2L-6NWE>.

⁴³ Carrie Hribar, *Understanding Concentrated Animal Feeding Operations and Their Impact on Communities*, ENVIRONMENTAL HEALTH SERVICE, CENTER FOR DISEASE CONTROL AND PREVENTION (Feb. 23, 2013), http://www.cdc.gov/nceh/ehs/docs/understanding_cafos_nalboh.pdf.

⁴⁴ Plowman, *supra* note 39.

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ Thayer et al., *supra* note 42.

⁴⁸ Plowman, *supra* note 39.

⁴⁹ POULTRY MEAT PROCESSING, 2 (Alan R. Sams ed., CRC Press 2001) [hereinafter SAMS].

⁵⁰ *Id.*

⁵¹ *Id.*

owned hatchery, and the integrator owns most, if not all other aspects of the production process.⁵²

D. Water Quality Impacts of AFOs

Environmental effects from concentrated livestock and poultry have been reported for decades. Animal production discharges include elevated concentration of hormones, heavy metals, antimicrobials, detergents, and disinfectants in the surrounding environment.⁵³ Concentration of chickens also increases manure (and subsequently litter) produced per acre. This is more usefully seen scientifically as a watershed-nutrient-balance problem, rather than as an ethical problem of blaming poultry producers for pollution.⁵⁴ Poultry concentration involves a massive relocation of nutrients in the form of corn, soybeans, and other feed from vast croplands (which are often located outside the Chesapeake Bay Watershed) to a relatively concentrated livestock production area. Chickens are extremely efficient (relative to other meat producers such as cattle and hogs) in producing meat from feed, but some feed becomes waste.⁵⁵

Poultry litter is manure mixed with wood shavings or sawdust, collected from the floor of poultry houses, and is typically composted then spread on crop fields for fertilizer. The litter is composted for several weeks before it is applied to remove bacteria and reduce nutrient concentration.⁵⁶ After composting, the litter is spread on agricultural fields where it is a valuable nutrient input for nearby crop production.⁵⁷ However, a nutrient imbalance can arise because the feed nutrients consumed on the Eastern Shore are derived from extensive croplands that are outside the region. Ideally, the nutrients (in the litter) would be returned as fertilizer to grow crops in the Midwest. Removal of nutrients from the Eastern Shore

⁵² *Vertical Integration: What it is- and Why it's Good for the Chicken Industry. . . and You*, THE NATIONAL CHICKEN COUNCIL, <http://www.nationalchickencouncil.org/industry-issues/vertical-integration/> (last visited Mar. 15, 2015), *archived at* <http://perma.cc/RW2Z-BMNU>.

⁵³ Hribar, *supra* note 43.

⁵⁴ *See id.*

⁵⁵ SAMS, *supra* note 49, at 275.

⁵⁶ *See generally* Milan Ihnat & Leta Fernandes, *Trace Elemental Characterization of Composted Poultry Manure*, 57 *BIORESOURCE TECH.* 143, 143-56 (1996); S. Mahimairaja et al., *Losses and Transformation of Nitrogen During Composting of Poultry Manure with Different Amendments: An Incubation Experiment*, 57 *BIORESOURCE TECH.* 265, 265-73 (1996); George Hochmuth et al., *Using Composted Poultry Manure (Litter) in Mulched Vegetable Production*, EDIS (2009), <http://edis.ifas.ufl.edu/pdf/files/SS/SS50600.pdf>.

⁵⁷ *Id.*

watersheds as finished poultry products is insufficient to return, fully, the nutrient balance of the watershed.⁵⁸

It is estimated that Delmarva had fifty thousand chickens in 1925, and that number increased to 602 million by 1998.⁵⁹ The sheer number of poultry grown and the use of fortified feed increased the use of feed from outside of the region, reduced the amount of feed grown within the region, and also limited the regional use of manure.⁶⁰ The net result of these forces is an excess of manure in Delmarva.⁶¹ Excess manure is managed in various ways such as ground application beyond crop-uptake need as a crop risk management strategy, trucking manure off-site or outside the watershed, and pelletization.⁶² Best management practices ("BMPs") such as vegetative buffers, litter management, and precipitation runoff control, can be used at the poultry facility or on fields where manure is spread to intercept nutrients and reduce nutrient concentration leaving the field.⁶³ However, even with the manure management strategies, excess nutrients are still problematic for waterways in areas where AFOs are present.⁶⁴

Watersheds with many AFOs (or high agricultural use in general) may experience water quality impairments such as decreased oxygen for aquatic species, toxic microorganisms, or bacteria concentrations that exceed standards due to high nutrient content and bacteria in manure or litter.⁶⁵ Eutrophication occurs when nutrients in excess of a water body's

⁵⁸ J.T. Sims, R. R. Simard, & B. C. Joern, *Phosphorus Loss in Agricultural Drainage: Historical Perspective and Current Research*, J. ENVTL. QUALITY 27, no. 2 (1998): 277–93; J. Thomas Sims, *Agricultural and Environmental Issues in the Management of Poultry Wastes: Recent Innovations and Long-term Challenges*. In ACS symposium series, vol. 668, pp. 72–90. Washington, DC: American Chemical Society (1974).

⁵⁹ *Id.*

⁶⁰ See Hribar, *supra* note 43, at 2.

⁶¹ See generally A. Sharpley et al., *Impacts of Animal Manure Management on Ground and Surface Water Quality*, in ANIMAL WASTE UTILIZATION: EFFECTIVE USE OF MANURE AS A SOIL RESOURCE 173 (J.L. Hatfield & B.A. Stewart eds., 1998); L.M. Ward & W. F. Ritter, *Options for Managing Broiler Manure Phosphorus on the Delmarva Peninsula Bridges*, in WORLD WATER & ENVIRONMENTAL RESOURCES CONGRESS 2003 (Paul Bizier & Paul DeBerry eds., 2003).

⁶² See Sharpley et al., *supra* note 61, at 214–15.

⁶³ See THERESIA LAVERGNE ET AL., LSU AGCENTER, POULTRY ENVIRONMENTAL BEST MANAGEMENT PRACTICES (BMPs) 8-28 (2011), available at <https://www.lsuagcenter.com/NR/rdonlyres/C7ADAF81-1D03-4FC5-9F04-9F890DEE60F5/81515/pub2806poultryBMPLOWRES1.pdf>.

⁶⁴ Hribar, *supra* note 43, at 3; Sims, *supra* note 58, at 289.

⁶⁵ Hribar, *supra* note 43, at 2; Robert Howarth et al., *Coupled Biogeochemical Cycles: Eutrophication and Hypoxia in Temperate Estuaries and Coastal Marine Ecosystems*, 9 FRONTIERS ECOLOGY & ENV'T 18–26 (2011); D.F. Boesch et al., *Chesapeake Bay Eutrophication:*

assimilative capacity provide fuel for primary production in the water column (mostly algae).⁶⁶ When the algae die, dissolved oxygen is consumed from the water column.⁶⁷ Fish, along with other aquatic organisms, die because they rely on dissolved oxygen to survive.⁶⁸ Submerged aquatic vegetation (“SAV”) provides habitat and also produces oxygen.⁶⁹ As the algae grow, light penetration through the water column is reduced, which reduces SAV growth and subsequently reduces habitat and oxygen production.⁷⁰ The decrease in SAV and dissolved oxygen both increase fish and other aquatic organism mortality.⁷¹ Nutrient excess can also encourage growth of toxic cyanobacteria and dinoflagellates (*Pfiesteria*) and increase drinking water filtration requirements.⁷² *Pfiesteria* is a toxic microorganism related to high phosphorous concentrations that invades fish and creates a potent neurotoxin that affects humans who have contact with the fish.⁷³ Recently, the toxic cyanobacteria bloom in Lake Erie near Toledo, Ohio, highlighted the extensive, negative impact of excess nutrients.⁷⁴ In addition, areas with AFOs can have bacteria levels that exceed primary contact recreation standards necessitating beach closures.⁷⁵

II. THE COMPARATIVE INSTITUTIONAL ANALYSIS METHOD

Institutional analyses are conducted in various ways and differ in the unit of analysis and what constitutes participation by important actors.⁷⁶ Institutional analysis nevertheless provides a framework for

Scientific Understanding, Ecosystem Restoration and Challenges for Agriculture, 30 J. ENVTL. QUALITY 303 (2001).

⁶⁶ Hribar, *supra* note 43, at 4–5.

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ *Id.*

⁷² See generally Joann M. Burkholder & Howard B. Glasgow, *History of Toxic Pfiesteria in North Carolina Estuaries from 1991 to the Present*, 51 BIOSCIENCE 827 (2001) (“Many toxic Pfiesteria outbreaks have plagued the Albemarle-Pamlico Estuarine System, including events both before and after the 1997 outbreaks in Chesapeake Bay.”).

⁷³ *Id.* at 839.

⁷⁴ Carl Zimmer, *Cyanobacteria Are Far from Just Toledo’s Problem*, N.Y. TIMES (Aug. 7, 2014), http://www.nytimes.com/2014/08/07/science/cyanobacteria-are-far-from-just-toledos-problem.html?_r=0, archived at <http://perma.cc/5NGV-YRCK>.

⁷⁵ *Id.*; Pamela Wood, *Summer Brings Waves of Water Testing for Bacteria in Anne Arundel*, BALTIMORE SUN (June 20, 2013), http://articles.baltimoresun.com/2013-06-20/news/bs-md-ar-beach-testing-20130620_1_water-testing-bacteria-beaches, archived at <http://perma.cc/3ZGZ-6JCM>.

⁷⁶ See Elinor Ostrom, *Institutional Rational Choice: An Assessment of the Institutional Analysis and Development Framework*, in THEORIES OF THE POLICY PROCESS 21 (2nd ed.

researchers to understand the “policy process by outlining a systematic approach for analyzing institutions that govern action and outcomes within collective action arrangements.”⁷⁷ Carr and others compare three methods for evaluating public and stakeholder participatory action in the European Water Framework Directive and the Clean Water Act.⁷⁸ Hardy and Koontz identify decentralized institutions as local decision making bodies that also necessitate involvement of the local residents and stakeholders.⁷⁹ Hardy and Koontz compare formal (laws and regulations) and informal (community exchange) institutional rules and the actions that result from government, citizen-centered, and mixed (government and citizen) participation to understand decision-making partnerships.⁸⁰ These two approaches help convey the variety of methods of institutional analysis, but this Article will follow the widely applied and cited method from Komesar.⁸¹ Komesar’s method uses a participation-centered approach to examine the performance of different resolution processes relative to important social goals, such as protection of property or promoting safety.⁸² Komesar, followed by Duke and Csoboth, focus on the goals of resource allocation efficiency and procedural fairness.⁸³

Komesar’s comparative institutional analysis (“CIA”) is an analysis of goal and institutional choices.⁸⁴ Komesar stresses that analyzing one institution alone will “tell us virtually nothing about these outcomes.”⁸⁵ The importance of comparing market, judicial, and political institutions helps examine what institutional choice best carries out society’s goals

2007); Berit Junker et al., *Objectives of Public Participation: Which Actors Should Be Involved in the Decision Making for River Restorations?* 43 WATER RESOURCES RES., no. 10, 2007, at 1; Vincent Luyet et al., *A Framework to Implement Stakeholder Participation in Environmental Projects*, 11 J. ENVTL. MGMT. 213–19 (2012).

⁷⁷ Sehl Mellouli et al., *Comparative Analysis of Technology Frameworks*, EGOVPOLINET SYNTHESIS REPORT OF KNOWLEDGE ASSETS, INCLUDING VISIONS (Mar. 3, 2014), available at http://www.policy-community.eu/results/annexes-to-d4.2/annex-ii.2-to-d4.2-comparative-analysis-of-technology-frameworks/at_download/file.

⁷⁸ G. Carr et al., *Evaluating Participation in Water Resource Management: A Review*, 48 WATER RESOURCES RES., no. 11., 2012, at 1.

⁷⁹ S.D. Hardy & T.M. Koontz, *Rules for Collaboration: Institutional Analysis of Group Membership and Levels of Action in Watershed Partnerships*, 37 POL'Y STUDIES J. 393, 394 (2009).

⁸⁰ *Id.*

⁸¹ See generally Daniel H. Cole, *The Varieties of Comparative Institutional Analysis*, 2013 WIS. L. REV. 383 (2012).

⁸² KOMESAR, *supra* note 10, at 5.

⁸³ See Duke & Csoboth, *supra* note 4, at 541, 551.

⁸⁴ KOMESAR, *supra* note 10, at 5.

⁸⁵ *Id.* at 4–5.

of efficiency, justice, and fairness.⁸⁶ Institutional participation in Komesar includes “consumers, producers, voters, lobbyists, and litigants.”⁸⁷ Accounting for the participating group’s actions and involvement determine how well the institutions function; additionally, the adjudicative and political process can be assessed in similar terms to the market process.⁸⁸ Komesar’s framework includes analysis of the costs and benefits of participation in the market, judicial, and political institutions.⁸⁹ A recent review showed that Komesar’s approach has made a significant, extensive impact on legal analysis.⁹⁰

Duke adapted Komesar’s approach to form a comparative resolution process that analyzes institutional performance in specific environmental conflicts, using the social goals of Coasean⁹¹ efficiency and fairness.⁹² Analysis of performance focuses on seven types of institutions (conflict resolution processes in reality) that process disputes involving environmental quality.⁹³ Duke’s method extends Komesar’s approach to focus on micro-level data and dovetails this with an extended version of John R. Commons’s⁹⁴ framing of market, managerial, and rationing transactions with the concept of environmental (or land-use) transactions.⁹⁵ The seven general processes for comparison in conflict resolution are: market, quasi-market, legislative, quasi-judicial, judicial, moral suasion, and alternative dispute resolution.⁹⁶ In Duke’s analysis institutions are rules or laws that guide the functioning of the resolution processes.⁹⁷ In application, the *Red Wolf Conflict* (“Red Wolf”),⁹⁸ compares conflict outcomes of the quasi-judicial and judicial process with the goals of procedural fairness and an operationalized substantive efficiency concept derived from Coase.⁹⁹ The *Red Wolf* analysis concluded that quasi-judicial resolution processes have a superior capacity to resolve conflicts with increased scientific

⁸⁶ *Id.* at 5.

⁸⁷ *Id.* at 7.

⁸⁸ *Id.*

⁸⁹ *Id.* at 8.

⁹⁰ See Gregory Shaffer, *Comparative Institutional Analysis and a New Legal Realism*, 2013 WIS. L. REV. 607, 607 (2012).

⁹¹ Ronald H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1, 1–2, 16, 44 (1960).

⁹² Duke, *supra* note 14, at 234, 248.

⁹³ Duke & Csoboth, *supra* note 4, at 550.

⁹⁴ John R. Commons, *Institutional Economics*, 21 AM. ECON. REV. 648, 653–54, 657 (1931).

⁹⁵ *Id.*; Duke, *supra* note 14, at 244–45.

⁹⁶ Duke & Csoboth, *supra* note 4, at 550.

⁹⁷ Duke, *supra* note 14, at 229–30.

⁹⁸ Duke & Csoboth, *supra* note 4, at 542.

⁹⁹ Coase, *supra* note 91, at 44.

complexity.¹⁰⁰ Similar to *Red Wolf*, the analysis of the *Waterkeeper v. Hudson* conflict herein examines the resolution processing between land-owners and environmental private parties. The judicial, quasi-judicial, legislative, and moral suasion resolution processes are compared using the metrics of procedural fairness and Coasean substantive efficiency.¹⁰¹

III. WATER QUALITY CONFLICT DATA

A. *Citizen Suit Provision*

The citizen suit provision established statutory standing for environmental groups to file suit against anyone “who is alleged to be in violation of . . . an effluent standard or limitation under this chapter.”¹⁰² The legislative process, through the Clean Water Act, began to allocate rights to parties in land-water nexus conflicts; however, this Article’s analysis will show that the rights allocation is incomplete in agriculture discharge problems and it is the unallocated rights that create conflict between parties.¹⁰³ Precedent is unclear in citizen suits, but it is clear Congress envisioned a limited reach, where citizen suits do not supplant but supplement state and federal enforcement actions.¹⁰⁴ The U.S. Environmental Protection Agency (EPA) has renewed focus on meeting goals to improve water quality, as demonstrated by the 2009 Executive Order¹⁰⁵ and the 2010 Chesapeake Bay total maximum daily load (the Bay-wide TMDL).¹⁰⁶ Recent litigation suggests pressure is building for EPA to regulate nonpoint sources as well as strengthen enforcement of agricultural point sources.¹⁰⁷

¹⁰⁰ Duke & Csoboth, *supra* note 4, at 542.

¹⁰¹ Coase, *supra* note 91, at 44.

¹⁰² Federal Water Pollution Control Act, 33 U.S.C. § 1365(a)(1) (1994).

¹⁰³ See *supra* Parts III.D.1 and III.D.2.

¹⁰⁴ Jonathan S. Campbell, *Has the Citizen Suit Provision of the Clean Water Act Exceeded its Supplemental Birth?*, 24 WM. & MARY ENVTL. L. & POLICY REV. 305, 343–44 (2000) (arguing that citizen suits that are allowed to proceed after a state consent decree is agreed upon “muddy the issues” of the regulatory and enforcement process, and that considering awarding court fees to the plaintiff citizens that spurred the settlement would recognize the intent of the statute provision).

¹⁰⁵ Exec. Order No. 13,508, Chesapeake Bay Protection and Restoration, 74 Fed. Reg. 23,099 (May 15, 2009).

¹⁰⁶ U.S. ENVTL. PROT. AGENCY, CHESAPEAKE BAY TOTAL MAXIMUM DAILY LOAD FOR NITROGEN ES-1 (2010), available at http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/FinalBayTMDL/BayTMDLExecutiveSummaryFINAL122910_final.pdf.

¹⁰⁷ The Clean Water Act of 1977, 33 U.S.C. §§ 1251 et seq. provides that, absent a permit and subject to certain limitations, the discharge of any pollutant by any person shall be

Several recent cases brought agricultural nonpoint pollution into judicial review. The United States Court of Appeals for the Second Circuit, in *Concerned Area Residents for the Environment v. Southview Farm*, found a New York dairy farm's manure spreading operations, typically considered a nonpoint source activity, to be a point source.¹⁰⁸ The court decided the operation was in association with a regulated concentrated animal feed operation (CAFO) and therefore was regulated under the CWA.¹⁰⁹ In *Pronsolino v. Nastri* the Ninth Circuit Appellate Court upheld the long-standing CWA interpretation that states must identify waters impaired solely by nonpoint sources and establish total maximum daily loads (TMDLs) for those waters.¹¹⁰ In 2011 a landmark decision was made unanimously in the Ninth Circuit Court of Appeals against forestry, lumber, and paper products associations.¹¹¹ The Ninth Circuit held in *Northwest Environmental Defense Center v. Brown (NEDC v. Brown)* that polluted runoff from logging roads—again typically considered a nonpoint source and also exempt from regulation in the CWA—that collects in ditches is not exempt under the CWA.¹¹² However, in March 2013 the U.S. Supreme Court reversed this ruling and found that national pollution discharge elimination system (NPDES) permits were not required.¹¹³ Justice Scalia in dissent stated that the majority opinion failed to give adequate clarity to logging as an industrial activity (industrial activities are regulated under NPDES).¹¹⁴ This case is important because it is one

unlawful. 33 U.S.C.S. § 1311(a). A pollutant includes solid waste, sewage, biological materials, and agricultural waste discharged into water. 33 U.S.C.S. § 1362(6). A “discharge” is “any addition of any pollutant to navigable waters from any point source.” 33 U.S.C.S. § 1362(12). The term “point source” includes “any discernible, confined and discrete conveyance, including but not limited to any concentrated animal feeding operation. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture. 33 U.S.C.S. § 1362(14). Under the Clean Water Act § 402, 33 U.S.C.S. § 1342(a) industrial, municipal, and concentrated animal feed operations (“CAFO”) point sources are regulated through the issuance of national pollution elimination discharge (“NPDES”) permits. § 1342. Although Sections 208 and 303 direct states to identify and control non point source pollution, under Sections 402 and 404 agricultural discharges (stormwater), not associated with a CAFO, are specifically exempt from regulation. 33 U.S.C.S. § 1362(14).

¹⁰⁸ *Concerned Area Residents for the Env't v. Southview Farm*, 34 F.3d 114 (2d Cir. 1994).

¹⁰⁹ *CARE*, 34 F.3d 114 (2d Cir. 1994).

¹¹⁰ *Pronsolino v. Nastri*, 291 F.3d 1123, 1125-26 (9th Cir. 2002).

¹¹¹ *Nw. Env'tl. Def. Center v. Brown (NEDC v. Brown)*, 640 F.3d 1063 (9th Cir. 2011).

¹¹² *Id.*

¹¹³ *Decker v. Nw. Env'tl. Def. Center*, 133 S. Ct. 1326 (2013).

¹¹⁴ 133 S. Ct. at 1344 (Scalia, J., dissenting).

(of several) that strongly argues that polluted runoff from diffuse sources which collects in pipes, ditches, and swales should be considered a point source. Like the claim in *NEDC v. Brown*, plaintiffs in the 2011 Maryland District case *Waterkeeper Alliance Inc. v. Hudson et al.* alleged Hudson was discharging illegally without an NPDES permit.¹¹⁵ The District Court of Maryland dismissed the plaintiffs' claim, but the implications of the judgment are important to consider in regard to citizen suit efficiency, fairness, and nonpoint source conflict resolution.

B. Hudson Case Study

Hudson is examined as a case study of the transactions that occur in the conflict resolution process to allocate rights. The timeline of the case is summarized as follows. The Hudson farm is located on the Eastern Shore of Maryland approximately 3.5 miles from the Pocomoke River. The Hudsons' operation is family owned and contains field crops, poultry, and beef cattle.¹¹⁶ In October 2009, the Waterkeeper Alliance and the Assateague Coastkeeper the (environmental party) flew over the Hudson farm, (poultry party) and photographed what was assumed to be a pile of poultry litter or manure near a ditch. The environmental party sampled water in the Franklin Branch of the Pocomoke River in October through December 2009, found elevated levels of nitrogen, phosphorous, and bacteria (pollution), then held a press conference and issued a press release.¹¹⁷ In anticipation that the pile was manure or litter and the poultry area of the farm was illegally discharging pollution from poultry litter, the environmental party filed notice of intent to sue based on a violation of the Clean Water Act in December 2009.¹¹⁸ The environmental party continued to sample the water in the Franklin Branch, found elevated pollution levels, and issued another press release in February 2010 claiming that the pile was "uncovered manure" next to a drainage ditch.¹¹⁹

¹¹⁵ *Waterkeeper Alliance, Inc. v. Alan & Kristin Hudson Farm (Hudson)*, Civil Action No. WMN 10-487 (D. MD. 2012).

¹¹⁶ *Id.* at *18. Perdue Farms, Inc., a poultry integrator that purchased Cornish hens from the Hudson farm, was initially named in the lawsuit, and subsequently dismissed under motion to dismiss. *Id.* at *1.

¹¹⁷ *Id.* at *4-5.

¹¹⁸ *Id.* at *4.

¹¹⁹ *Id.* at *4-5. The environmental party sampled the Franklin Branch through April 2010 and found elevated levels of nitrogen (Total Kjeldahl Nitrogen), Phosphorous (P), *Escherichia*

State of Maryland employees from three agencies, including the Department of Environment (“MDE”), Soil Conservation District, and Department of Agriculture, visited the Hudson farm for a regulatory inspection in December 2009.¹²⁰ This visit was in response to the intent to sue, and the state employees discovered that the pile, which the environmental party saw on their flight, was Class A bio-solids from the Ocean City Wastewater Treatment plant and not poultry litter.¹²¹ During the December 2009 inspection, MDE issued a \$4,000 fine to Hudson for “improper storage,” which an administrative judge later declined to impose.¹²² MDE visited the Hudson farm again on January 26, 2010, and sampled the ditches on the farm.¹²³ No fines were issued at this visit; however, one of the MDE samples revealed significantly elevated pollution levels in the ditch close to where the environmental party water samples were collected this visit.¹²⁴

On March 1, 2012, Maryland District Judge William Nickerson denied cross-motions for summary judgment and the case continued to a bench trial.¹²⁵ The trial proceeded with ten days of testimony, and closing arguments were heard November 30, 2012.¹²⁶ Judge Nickerson issued his opinion on December 20, 2012, and in his conclusions of law, he found the Waterkeepers did have standing based on their use (kayaking) of various branches of the Pocomoke River.¹²⁷ The opinion also stated that if the Hudson farm were the cause of high levels of bacteria and nutrients, then the plaintiff would be affected.¹²⁸ However, Nickerson did not find a violation of the CWA because the plaintiff failed to show by a preponderance of evidence that the high levels of nutrients and bacteria came only from the poultry operation.¹²⁹ During the trial, expert testimony revealed a

Coli (E. Coli, bacteria), and fecal coliforms (FC). *Hudson*, Civil Action No. WMN 10-487, at *4–5.

¹²⁰ *Id.* at *4.

¹²¹ *Id.* at 11. Class A biosolids are “exceptional quality” and have been treated to remove pathogens and metals. Farmers may spread biosolids on their fields for fertilizer. Other biosolid classes or spreading large quantities of biosolids may necessitate a state permit for use and spreading (Environmental Protection Agency), <http://water.epa.gov/polwaste/wastewater/treatment/biosolids/genqa.cfm>, archived at <http://perma.cc/2C9P-3HUH>.

¹²² *Hudson*, Civil Action No. WMN 10-487, at *4 n.6.

¹²³ *Id.* at *5-6.

¹²⁴ *Id.* at *1.

¹²⁵ *Id.*

¹²⁶ *Id.*

¹²⁷ *Id.* at *1, *15.

¹²⁸ *Hudson*, Civil Action No. WMN 10-487, at *15.

¹²⁹ *Id.* at *19.

more likely source was manure combined with precipitation runoff from the area where beef cattle grazed unconfined.¹³⁰ In dicta, Nickerson found there was "insufficient evidence to impose CWA liability on Perdue."¹³¹ However, Nickerson also stated in dicta that this does not mean integrators could not, under certain circumstances, be held liable for a CWA violation.¹³² Establishing this liability was the foremost goal (in addition to protecting water quality) of the environmental party because integrator liability would force a comprehensive change in the production of almost all U.S. poultry.¹³³

Conflict in this case existed because the poultry party pursued a high-intensity use of land-water resources, while the environmental party desired a low-intensity use. Prior to historical intensification of farming practices, low-intensity use prevailed.¹³⁴ Prior to the conflict there is no recognized difference in intensity of use.¹³⁵ When differences arise regarding use of the resource at stake, it is known as conflict activation.¹³⁶ A resource at stake is described as the resource that provides environmental services to both of the parties.¹³⁷ In this conflict the resource at stake is the water-land nexus where the high-intensity use of excess litter or manure spreading exceeds the capacity of the land and water to absorb and incorporate the excess. The excess causes external effects to the surrounding environment, but also lowers the cost of agricultural production. During the nonactivation period, an informal rights regime prevails, where the high-intensity user had a privilege to act as if they had property rights to the land-water resource.¹³⁸ The conflict arises because a party contests the privilege and, in informal rights regime, has no right to restrain the privileged party.¹³⁹ Following the CWA, a series

¹³⁰ *Id.* at *7.

¹³¹ *Id.* at *18.

¹³² *Id.*

¹³³ *Judge Nickerson Rules in Perdue/Hudson Clean Water Act Pollution Lawsuit*, ASSA-TEAGUE COASTAL TRUST, <http://www.actforbays.org/defendcleanwater/home.html>, archived at <http://perma.cc/MR/J9-XY9L>.

¹³⁴ UMD, *supra* note 30.

¹³⁵ See Duke, *supra* note 14, at 232-33; Duke & Csoboth, *supra* note 4, at 555.

¹³⁶ See Duke & Csoboth, *supra* note 4, at 553.

¹³⁷ See *id.*

¹³⁸ See Wesley Newcomb Hohfeld, *Fundamental Legal Conceptions as Applied in Judicial Reasoning*, 26 YALE L. J. 710, 755-56, 769 (1917); DANIEL W. BROMLEY, *ECONOMIC INTERESTS AND INSTITUTIONS* 213 (1989); DANIEL W. BROMLEY, *ENVIRONMENT AND ECONOMY: PROPERTY RIGHTS AND PUBLIC POLICY* 15 (1991) [hereinafter BROMLEY].

¹³⁹ See BROMLEY, *supra* note 138, at 15.

of legislative, quasi-judicial, and judicial decisions led to the assignment of conditional rights to the resource at stake.¹⁴⁰ Over time, the contested set (or bundle) of use rights continually narrows, as more formal rules are articulated and parties are granted rights or duties to observe the assigned rights.¹⁴¹ The judicial process in the *Hudson* case recognized established rights to the poultry party and placed the environmental party in the duty bearer's position.¹⁴² Some rights in this case could be considered conditional because Judge Nickerson's opinion implies that, simply because a violation was not found in this case, it does not mean this is true in all cases of agricultural operations.¹⁴³

Recent developments in concentrated animal feed operations (CAFO) regulation indicate that each party's set of conditional rights and duties are continuing to evolve, with the poultry parties, as well as other agricultural producers, bearing duties to the benefit of the environmental party through land-use and production restrictions.¹⁴⁴ In Maryland, all large, medium, and some small CAFOs have to apply for NPDES permits or state compliance (that they are exempt).¹⁴⁵ Maryland also has state regulations for feed operations that do not fit the CAFO categories (termed a MAFO).¹⁴⁶ Since 1998, nutrient management laws require management plans to protect water quality, and increasing plan-compliance remains a Maryland Department of Agriculture priority.¹⁴⁷ The Hudson farm was a CAFO by both EPA and MDE standards, but at the time of the suit the farm did not have an NPDES permit.¹⁴⁸ Regulations defined the Hudson farm as a CAFO, which means it is required to have an NPDES permit for the regulated areas.¹⁴⁹

¹⁴⁰ See Duke, *supra* note 14; Duke & Csoboth, *supra* note 4, at 553.

¹⁴¹ See Duke & Csoboth, *supra* note 4, at 553-54.

¹⁴² See Hohfeld, *supra* note 138, at 755-56, 769; BROMLEY, *supra* note 138, at 15.

¹⁴³ *Waterkeeper Alliance, Inc. v. Hudson*, no. WMN-10-487, 2012 WL 6651930, at *16-*17 (D. Md. Dec. 20, 2012).

¹⁴⁴ MARYLAND DEPT. OF THE ENVIRONMENT, AFO (2013), *available at* <http://www.mde.state.md.us/programs/Land/RecyclingandOperationsprogram/AFO/Pages/index.aspx>, *archived at* <http://perma.cc/4ZGU-KU5L>.

¹⁴⁵ *Id.*

¹⁴⁶ *Id.*

¹⁴⁷ MARYLAND DEPT. OF AGRICULTURE, NUTRIENT MANAGEMENT PROGRAM 2013 ANNUAL REPORT 2(2013), *available at* http://mda.maryland.gov/resource_conservation/counties/MDANMPAnnual2013.pdf.

¹⁴⁸ *Hudson*, 2012 WL 6651930, at *16.

¹⁴⁹ MARYLAND DEPT. OF THE ENVIRONMENT, *supra* note 144.

C. *Characterization of Parties*

To follow Komesar's participatory approach to comparative institutional analysis and understand how the conflict was processed in *Hudson*, it is necessary to characterize the parties and their ability to articulate and defend their interests in the conflict.¹⁵⁰ The drivers of participation costs include the party's wealth, numbers, concentration of interest, cohesiveness, stakes per capita, resolution, and participation costs; these criteria define the relative strength of the party's position in the conflict resolution process.¹⁵¹ Sophistication is defined herein by the first four categories (wealth, numbers, concentration of interest, cohesiveness).¹⁵² For example, if a party lacks organization, interests are not concentrated, and membership is large in number, then it may be difficult to gain sufficient monetary support that allows the party to present and argue interests coherently. Thus, they would be lacking in sophistication. The stakes per capita for each party identify the value of the resource at stake for each person in that party.¹⁵³ A resource at stake (as described above) is the resource that provides environmental services to both of the parties and in this conflict is the use of the water-land nexus.¹⁵⁴ If a party contains a great number of members, the stakes in the resource are spread among the individuals. The greater the number of members within a party, the greater the likelihood of heterogeneous interests and the potential for disparate stakes. If the stakes are low, it signals a weakness in the party and affects the ability to have the outcome (right) awarded in their favor.¹⁵⁵ Participation costs are the costs the parties incur to proceed in the resolution processes.¹⁵⁶ For example, the expenses of hiring a lawyer or experts are costs the party incurs to participate in the judicial process.

The two general types of parties in this conflict are the poultry producers and the environmentalists. Others outside of a formal organization (dormant members) may also have interests aligned with these parties.¹⁵⁷ The poultry producers are high-intensity users because they alter the natural state of the water-land resource. An implication of this behavior

¹⁵⁰ See KOMESAR, *supra* note 10; Duke, *supra* note 14, at 231; Duke & Csoboth, *supra* note 4, at 552.

¹⁵¹ See Duke & Csoboth, *supra* note 4, at 553.

¹⁵² See *id.* at 560 (giving an example of how this definition applies to a given situation).

¹⁵³ See *id.* at 533.

¹⁵⁴ See *id.*

¹⁵⁵ See *id.* at 577.

¹⁵⁶ See *id.* at 552.

¹⁵⁷ See Duke & Csoboth, *supra* note 4, at 559–60, 562 n.82.

is that the high-intensity users have, in effect, limited the use opportunities valued by the low-intensity users for the same resource. The second party is the environmentalists such as the Waterkeeper or the Atlantic Coastkeeper who value the low intensity use of the resource at stake. The impairment of water is caused by handling methods and land characteristics (ditching, soil loading, and storm water runoff), which allow fertilizer (manure or litter) to travel from the farm to the waterway. The conflict's resource at stake is therefore the nexus of land and water that is affected by the high-intensity use of land (manure or fertilizer input) which in turn effects water quality relative to intensity of use. Animal agriculture production decisions meet water bodies and have the potential via transportation mechanisms to impact naturally occurring nutrient balances in water bodies and in the Chesapeake Bay. That is not to say these natural levels must never be exceeded, but rather, that when they are, a conflict between low-intensity users and high-intensity users activates.¹⁵⁸ The characterization of the two parties and their participation costs are described below.

1. Poultry Party

The poultry party's estimated numbers, wealth, concentration of interest, cohesiveness, stakes per capita, resolution, and participation costs show the party is well positioned to participate in resolution processes. The Perdue Company, Inc. (Perdue) and Hudson farm are part of the broader U.S. poultry and egg industry, and in Maryland the broiler chickens are a billion dollar per year business.¹⁵⁹ The Delmarva Poultry Industry is part of the U.S. Poultry and Egg Association, an industry trade group whose members are producers and processors of poultry and eggs throughout 27 states and worldwide member companies.¹⁶⁰ There are approximately 1,700 broiler chicken farm families on the Delmarva Peninsula who produce 11 million chickens per week.¹⁶¹ These chickens are

¹⁵⁸ See *id.* at 541.

¹⁵⁹ *Broilers: Production and Value of Production by Year*, NATIONAL AGRICULTURAL STATISTICS SERVICE, (ND), http://www.nass.usda.gov/Charts_and_Maps/Poultry/brprv1.asp (last visited Mar. 15, 2015), archived at <http://perma.cc/2NEW-8K8F>; *Facts about Maryland's Meat and Chicken Industry*, DELMARVA POULTRY INDUSTRY, (ND) http://www.dpichicken.org/faq_facts/docs/factsmd2013.pdf.

¹⁶⁰ *About*, U.S. POULTRY & EGG ASS'N, <http://www.uspoultry.org/about/> (last visited Mar. 15, 2015), archived at <http://perma.cc/7PCA-5Z32>.

¹⁶¹ *Industry Tour: How the Broiler Chicken Industry Works*, DELMARVA POULTRY INDUSTRY, http://www.dpichicken.org/media/nr_view.cfm?id=353 (last visited Mar. 15, 2015), archived at <http://perma.cc/47MZ-NNUU>.

grown for four integrators (including Tyson and Perdue), which control much of the production process. For instance, the farmers are provided with materials (bedding), services (bird health care), and technical assistance.¹⁶² The poultry industry has extensive economic impacts beyond production, and it employs more than 14,000 Delmarva residents.¹⁶³ In 2012, the U.S. Poultry and Egg Association funded \$2 million in promotion, education, communication, and research effort.¹⁶⁴ The industry group does not list its annual income from membership, donations, and other support. This association represents the Delmarva Poultry Industry,¹⁶⁵ though other catalytic subgroups of the larger poultry and egg industry exist.¹⁶⁶

Concentration of interest and cohesiveness of the party are related in that the two parties named in the lawsuit (Hudson and Perdue) are part of the poultry party. In addition, there is a significant concentration of interests and cohesiveness in the high-intensity user party because their interests are aligned in producing poultry. It is the primary business, function, and intent of both the named parties and the poultry party at large.

Stakes (as described above) are the value of the resource at stake to the party, or the difference between their received value with and without the resource at stake.¹⁶⁷ The resource at stake in this conflict is the use of the specific water-land nexus on and near the Hudson farm. The various ways poultry litter is managed affects the costs of the poultry production business, and some techniques that lower the costs of production (high-intensity, large litter production) may also create external effects to the environment.¹⁶⁸ The poultry party's stakes per capita are described as moderate—meaning important but not the most important aspect of production—because the costs of managing the poultry litter may be low or high depending on the individual poultry uses that might be assigned

¹⁶² *Id.*

¹⁶³ *Id.*

¹⁶⁴ *About*, *supra* note 160.

¹⁶⁵ *Lobbying Spending Database Poultry & Eggs, 2013*, OPENSECRETS.ORG, <http://www.opensecrets.org/lobby/indusclient.php?id=A05&year=2013> (last visited Mar. 15, 2015), archived at <http://perma.cc/RP79-49R2>.

¹⁶⁶ Komesar, *supra* note 10. Catalytic subgroups as described by Komesar represent a concentrated group within a greater group that operates on behalf of the greater group. Concentrated interests of the catalytic subgroup may spur legal action on behalf of the greater group.

¹⁶⁷ *See* Duke, *supra* note 14, at 242.

¹⁶⁸ Rufus C. Young, Jr. & Stephen R. Onstot, *The Farm News: The National Strategy for Animal Feeding Operations and Other News*, Se11 A.L.I.-A.B.A. 639 (1999).

rights. Costs of production increase through regulation, which currently include nutrient management plans, installing best management practices, and permitting for CAFOs. It will be qualitatively argued below that the stakes for the poultry party are higher than the stakes for the environmental party.

In litigation, Perdue supplied Hudson with expert witnesses and lawyers that argued the case on the Hudson's behalf.¹⁶⁹ This is because a loss in the *Hudson* case could have ramifications for the poultry integrator.¹⁷⁰ The cost of litigation for Hudson and Perdue of this particular case can be estimated because Perdue requested \$3 million be covered by the Waterkeepers Alliance for the costs of the frivolous lawsuit.¹⁷¹ Judge Nickerson denied awarding court fees as (generally) the lawsuit was not "frivolous, unreasonable, or without foundation."¹⁷² If lobbying costs are considered an indication of participation costs in the legislative process, the poultry and egg industry spent \$840,000 in 2013 with a recent egg and poultry industry high of \$1.6 million in 2012.¹⁷³ A portion of this total could be attributed to concerted action by the poultry party.

2. Environmental Party

The environmental party's estimated numbers, wealth, concentration of interest, cohesiveness, stakes per capita, resolution, and participation costs show the party is not as well positioned to participate in the formal resolution process as is the poultry party. According to its website, Waterkeeper Alliance, Inc. is an organization focused on helping other watershed organizations fight for the right to clean water.¹⁷⁴ Member organizations, such as the Assateague Coastal Trust (ACT), receive support from the Waterkeeper Alliance to battle the common pollution issues that face many watersheds today.¹⁷⁵ The Waterkeeper Alliance states

¹⁶⁹ *Waterkeeper Alliance, Inc. v. Hudson*, no. WMN-10-487, 2012 WL 6651930, at *1, *7 (D. Md. Dec. 20, 2012).

¹⁷⁰ See Scott Edwards, *Big Poultry Needs to Clean Up After Itself*, CHESAPEAKE BAY ACTION PLAN, <http://www.bayactionplan.com/big-poultry-clean-up/> (last visited Mar. 15, 2015), archived at <http://perma.cc/JW8Q-SSK4>.

¹⁷¹ *Perdue, Farm Can't Recoup Pollution Suit Fees*, Associated Press, Aug. 28, 2013, <http://baltimore.cbslocal.com/2013/08/28/perdue-farm-cant-recoup-pollution-suit-fees/> (last visited Mar. 15, 2015), archived at <http://perma.cc/64MT-E8ST>.

¹⁷² *Id.*

¹⁷³ *Lobbying Spending Database Poultry & Eggs, 2013*, *supra* note 165.

¹⁷⁴ *Mission of the Waterkeeper Movement*, WATERKEEPER ALLIANCE, <http://waterkeeper.org/what-we-do/our-mission/> (last visited Mar. 15, 2015), archived at <http://perma.cc/K4LE-3Y5J>.

¹⁷⁵ *Id.*

that the public is the owner of waterways, and “pollution is theft.”¹⁷⁶ Further, when government fails, “it is the right and responsibility of citizens to enforce environmental laws and protect our right to clean water.”¹⁷⁷ ACT has more than 5000 members and works to protect the Delmarva Peninsula and the Atlantic Coastal Bays watershed through advocacy, conservation, and education.¹⁷⁸ ACT, a membership organization of the Waterkeeper Alliance, has a small staff with an executive director, titled the Assateague Coastkeeper, who is charged with patrolling and monitoring the Delmarva Peninsula watersheds.¹⁷⁹ The Waterkeeper Alliance has over 200 organizations in 23 countries on six continents.¹⁸⁰ The Waterkeeper Alliance 2012 audited financial report lists net assets at \$1,611,579, and the ACT Internal Revenue Service Form 990 lists net assets at \$256,331.¹⁸¹

There is relatively less concentration of interest and cohesiveness of the environmental party when compared to the poultry party. One mission of the Waterkeeper Alliance and ACT is to protect the waterways through active citizen involvement.¹⁸² However, these interests are not well aligned; the Waterkeeper Alliance, as the larger group, has a broader focus (e.g. global climate change and clean and safe energy) than the ACT because of its international and national focus.¹⁸³ In addition, this party would have: (1) active members; (2) members who value clean pollutant free water and may contribute but do not actively participate in the ACT (or Waterkeeper Alliance) activities; and (3) nonmembers who share many interests with these groups but do not participate. The latter group

¹⁷⁶ *You Have the Right to Clean Water*, WATERKEEPER ALLIANCE, <http://waterkeeper.org/know-your-rights/> (last visited Mar. 15, 2015), archived at <http://perma.cc/2NUU-9QKW>.

¹⁷⁷ *Id.*

¹⁷⁸ *What We Do*, ASSATEAGUE COASTAL TRUST, <http://www.assateaguecoastkeeper.org/> (last visited Mar. 15, 2015), archived at <http://perma.cc/9XZ4-RGNM>.

¹⁷⁹ *Assateague Coastkeeper*, ASSATEAGUE COASTAL TRUST, <http://www.actforbays.org/coastkeeper/index.html> (last visited Mar. 15, 2015), archived at <http://perma.cc/L3L3-XEEP>.

¹⁸⁰ Clark Canfield, *Waterkeeper Movement Thrives from Maine to Nepal*, PORTLAND PRESS HERALD, Sept. 29, 2013, available at <http://www.pressherald.com/2013/09/29/waterkeeper-movement-thrives-from-maine-to-nepal/>, archived at <http://perma.cc/2AE9-PHH2>.

¹⁸¹ *IRS 990 Form | Fiscal Year 2012*, WATERKEEPER ALLIANCE, available at <http://waterkeeper.org/cms/assets/uploads/2014/07/FY12%20990%20web.pdf>; *2012 IRS 990 Filing*, ASSATEAGUE COASTAL TRUST, available at <http://www.actforbays.org/WhoWeAre/Docs/990form2012.pdf>.

¹⁸² *See Staff Members*, WATERKEEPER ALLIANCE (last visited Mar. 15, 2015).

¹⁸³ *Advocacy Campaigns*, WATERKEEPER ALLIANCE, <http://waterkeeper.org/what-we-do/advocacy-campaigns> (last visited Mar. 15, 2015), archived at <http://perma.cc/92XX-EXD2>.

is likely to be very large and likely constitutes a dormant majority.¹⁸⁴ With a small paid staff, ACT is able to provide structure and action for its members relative to other watershed organizations who may not have paid staff. Being a member of the Waterkeeper Alliance focuses ACT's organization campaigns and goals and therefore provides cohesiveness to the party relative to other less organized environmental parties, such as smaller watershed groups. The diffusion of members' interests and small active core characterizes many environmental organizations and influences the impact the groups have on individual issues outcome.¹⁸⁵

3. Per Capita Costs and Benefits of Participation

The overall stakes per capita are the value of some degree of protected access to the resource at stake to each member within the respective parties.¹⁸⁶ This changes with every institutional change. The participants compare the potential benefits of change with the costs of participating in the resolution process.¹⁸⁷ That said, one party can often force another party to participate by unilaterally seeking resolution (such as suing).¹⁸⁸ There are differences in the calculation of stakes for the two parties. Value of the right for the poultry party is observed as private cost of more expensive management of the litter, which in turn affects nutrient and bacteria levels entering proximal water bodies. The environmental value derives from the right to impose these management costs on the poultry party and an improved use of low-intensity activities, if the water has less pollution loading. At a simple level, one compares the high-intensity use of the water-land nexus by Hudson to that of the kayaking of Waterkeepers and the groups they represent along with other low-intensity activities. In the bilateral world of one farm and a group of affected environmentalists, the value of the poultry stake is higher because they face real costs in changing management practices. However, there would be

¹⁸⁴ Wendy Wager, Note, *The Participation-Centered Model Meets Administrative Process*, 2013 WIS. L. REV. 689, 690-91.

¹⁸⁵ See Willett Kempton et al., *Local Environmental Groups: A Systematic Enumeration in Two Geographical Areas*, 66 RURAL SOCIOLOGY, no. 4 2001, at 557-78. Kempton et al. found a surprising number of environmental organizations—more than other researchers. The groups were diverse and politically focused with core members focusing on essentially the legislative and political process with a lack in ability to motivate the largely inactive local stakeholders.

¹⁸⁶ Duke, *supra* note 14.

¹⁸⁷ *Id.*

¹⁸⁸ *Id.*

almost no perceptible change in water quality from this one farm changing practices. Waterkeeper and ACT represent use values of environmentalists that are kayaking on the Pocomoke River. If all farms would be forced to bare expanded management costs, then water quality would indeed improve and the value of the environmentalists' stake in water use would expand to include activities such as swimming.¹⁸⁹ However, water quality would not be substantially improved by winning this one case against one farm. Therefore, the value of the right is lower for the environmental party as a whole. However, the conflict had broader implications than simply the activity of Hudson's farm, in isolation.

Resource allocation efficiency is evaluated with two states of the world that might arise from any institutional change, one where an expanded right resides with the environmental party and one where a competing right resides with the poultry farmer party. The Waterkeeper Alliance's Clean Water Defense and Pure Farms, Pure Waters campaigns list goals of strengthening regulatory and legal action and "eliminating the impacts of factory farms" (respectively).¹⁹⁰ These campaigns indicate there is high value in spending the group's resources promoting the removal of industrialized farms; nonetheless, diffuse membership dilutes the per capita stake of the expenditure. If the *Hudson* conflict was decided differently and (at the extreme) the environmental party obtained an injunction against Hudson, pollution entering the Chesapeake Bay would remain. That is, by winning this particular case, there would be no impact on pollution overall because conflict represents an incomplete portion of the impact of approximately 6,000 poultry houses in the Delmarva Peninsula (estimate from 1999).¹⁹¹ Further, if some poultry exited the industry, it would likely be replaced by other land uses that also contribute nutrients

¹⁸⁹ A wealth of research conducted over the past several decades has searched for the economic value of natural resources and ecological services. Recent literature (e.g., Bonnie L. Keeler, Stephen Polasky, Kate A. Brauman, Kris A. Johnson, Jacques C. Finlay, Ann O'Neill, Kent Kovacs, & Brent Dalzell, *Linking Water Quality and Well-Being for Improved Assessment and Valuation of Ecosystem Services*, PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES 109, no. 45 (2012): 18619–18624; George Van Houtven, John Powers, & Subhrendu K. Pattanayak, *Valuing Water Quality Improvements in the United States Using Meta-analysis: Is the Glass Half-Full or Half-Empty for National Policy Analysis?*, RESOURCE AND ENERGY ECONOMICS 29, no. 3 (2007): 206–228) describes the multiple difficulties in not only determining *what* to value but also magnitude of the value.

¹⁹⁰ *Campaigns*, WATERKEEPER ALLIANCE, INC., <http://waterkeeper.org/> (last visited Mar. 15, 2015), archived at <http://perma.cc/RQT5-5BYT>.

¹⁹¹ Peter S. Goodman, *An Unsavory Byproduct: Runoff and Pollution*, WASHINGTON POST, Aug. 1, 1999, <http://www.washingtonpost.com/wp-srv/local/daily/aug99/chicken1.htm> (last visited Mar. 15, 2015), archived at <http://perma.cc/4FDZ-576D>.

to the waterways. Therefore, the direct stakes of the active and dormant members of the environmental party are comparatively lower because not obtaining the right of injunction still allows some use of the resource. However, if the poultry party lost and the right given to the environmental party in the form of an injunction, the stakes (in the form of costs of production or being forced to cease operation) would readily change. That said, there is a potential for a precedent-setting outcome (if an injunction was granted) that could trigger gains in related water quality conflicts by enforcing the cost of water quality protection borne by the poultry party. This dynamic impact is difficult to estimate, and it helps explain why the Waterkeeper Alliance likely devoted so much effort to this conflict and why Perdue was named as a defendant.

The resolution and participation costs of the environmental party are estimated to be lower relative to those of the poultry party. The Waterkeeper Alliance was formed in the 1990s from the Hudson Riverkeeper watershed organization. Both groups concentrate on fighting water pollution through litigation.¹⁹² Unlike the poultry farmer party, the environmental group does not appear to have a specific industry or interest group that concentrates on lobbying alone.¹⁹³ The Assateague Coastkeeper and other paid staff of the Waterkeeper Alliance lobby as part of their job duties, and advocacy appears to be one of the top duties for the Assateague Coastkeeper.¹⁹⁴ The operational model for the Waterkeeper Alliance is to engage local law clinics, as occurred with the *Hudson* case. The University of Maryland's law clinic has been criticized for representing the Waterkeepers, not only because the case was ultimately assessed to be weak by the judge but also because the clinic is taxpayer-funded and yet was attacking an important state industry.¹⁹⁵ From the judicial opinion, one infers that the experts and argument-quality of the Waterkeeper were of lower quality than that of Hudson and Perdue.¹⁹⁶ In sum,

¹⁹² *Who We Are, Board of Directors*, <http://waterkeeper.org/who-we-are/board-of-directors/robert-f-kennedy-jr/> (last visited Mar. 15, 2015), *archived at* <http://perma.cc/L9MQ-U7Y3>.

¹⁹³ OPEN SECRETS.ORG, <http://www.opensecrets.org/> (last visited Mar. 15, 2015), *archived at* <http://perma.cc/4NMM-73BM>.

¹⁹⁴ ASSATEAGUE COASTKEEPER, *Assateague Coastal Trust*, <http://www.actforbays.org/coastkeeper/index.html> (last visited Mar. 15, 2015), *archived at* <http://perma.cc/6NZD-FQAE>.

¹⁹⁵ Walter Olson, *Ruling Discredits UM Law Clinic's Involvement, State-Funded Programs Should Not Go on Ideologically Driven Environmental Adventures like the Hudson Farm Case*, THE BALTIMORE SUN, December 27, 2012, http://articles.baltimoresun.com/2012-12-27/news/bs-ed-hudson-lawsuit-20121227_1_hudsons-waterkeeper-alliance-environmental-law (last visited Mar. 15, 2015), *archived at* <http://perma.cc/564P-RNVC>.

¹⁹⁶ *Hudson*, *supra* note 1. It can be inferred from Judge Nickerson's comments during presentation of the facts and opinion that the Waterkeeper Alliance argument, evidence,

the costs of the environmental group's participation in the conflict resolution process were lower compared with the poultry farmer's costs in part because the multibillion dollar poultry industry is able to provide better support through the judicial process than grassroots-volunteer organizations. This does not mean that "industry" should win over the "environment," just that the monetary status and cohesiveness of the poultry party provide better opportunities for positive outcome in the judicial process.

The poultry party is highly organized, concentrated, and sophisticated, with at least 14,000 members in Delmarva.¹⁹⁷ The cohesion derives from the vertically integrated nature of poultry production in the region, where a corporate integrator closely monitors the production process and inputs managed by the "grower" farmer. The stakes per capita are medium due to varying costs of production. The costs of participation in formal resolution are high but are spread over many well-organized groups, meaning that the average participation costs are low. Most formal participation would take place, due to the concentration of interests, with representatives such as lawyers, lobbyists, and experts.

The stakes per capita for the environmental party are comparatively low, as argued above. Member numbers for the party are not readily available, but this party likely contains a large dormant population. However, the effect of this particular case on the outcome of pollution reduction to the Chesapeake Bay is effectively zero because it ostensibly affects a single operation. If the judgment affected precedent, then the remaining 6,000 poultry houses might be considered and the stakes per capita would be higher, but the costs would also be higher in organizing the disparate environmental interests. The costs of participation in the narrow, one-farm conflict are low because there is a catalytic subgroup, but the sophistication is relatively high because of this catalytic subgroup.¹⁹⁸ Stakes per capita and factors described above are an important for consideration in the next section that analyzes institutional efficiency and fairness.

The summary of the party characteristics reveals that protracted, complex conflict resolution exposes the strength of the poultry party and the comparative limitations of the environmental party. The poultry party

and presentation of facts was substandard compared to Hudson's.

¹⁹⁷ *Look what the Chicken Industry Is Doing for Delmarva*, https://www.dpichicken.org/faq_facts/docs/Delmarva%20Chicken%20Production%20Facts%201969-2011.pdf (last visited Mar. 15, 2015).

¹⁹⁸ Komesar, *supra* note 10. As described in Komesar, the "catalytic subgroup" is a smaller group within a dormant majority that operates to activate the dormant members through collective action.

also has a higher valued use for the resource at stake—this is due largely to the direct stakes per capita, which are low for the environmental party. This, in turn, will affect the efficiency and fairness of the resolution processes further described below.

D. Transaction Outcome and Rights Allocation

Environmental transactions are instances where two parties challenge one another for presumptive or legal control over the resource at stake.¹⁹⁹ In this conflict, environmental transactions occur in market, legislative, and judicial resolution processes throughout the history of the dispute, over the course of which specific rights of the two parties are assigned and made more specific. During this period of dispute processing, control over the resource at stake has the potential to be reallocated. The transaction events move through general and specific resolution processes that determine the outcome and resultant resource rights allocation. General resolution processes are: market, quasi-market, judicial, quasi-judicial, legislative, moral suasion, and alternative dispute resolution (such as mediation or arbitration).²⁰⁰ Specific resolution processes are the constructed arenas where the transaction outcomes are determined, such as a given state court of first instance.²⁰¹ The specific resolution processes may occur at federal, state, and local levels and in legislative, quasi-judicial, and judicial bodies. The quasi-judicial bodies enact regulations following federal or state statute (laws) and have ability to impose fines and approve or decline project permits.

Environmental conflict originates in an informal (or presumptive) rights regime, where the high-intensity user of the resource acts with privilege and shifts costs via negative externalities at will to others (low intensity users).²⁰² The informal rights regime ends, and a formal rights regime begins, first with local ordinances, a state statute, and/or a federal statute, and then followed by administrative rules (i.e., nutrient management regulations, water quality standards, and pollution discharge permits) that restrict the rights of the high-intensity user (i.e., animal feed operations).²⁰³ The parties' interests conflict over the rights allocation, where each party wants the fullest set or bundle of rights to access the

¹⁹⁹ Duke & Csoboth, *supra* note 4.

²⁰⁰ *Id.*

²⁰¹ *Id.*

²⁰² *Id.*

²⁰³ *Id.*

resource at stake. The bundle of rights term is used to explain that property rights include multiple pieces, not just one right.²⁰⁴ The environmental party received rights under the CWA that are expressly granted (no unauthorized discharges to Waters of the United States are allowed). However, unallocated rights remain (nonpoint source) and the environmental groups seek to obtain rights through pursuing point source operations in litigation.

1. Informal Rights Regime

Environmental transactions allocate rights, progressively moving the rights regime from informality to ever more formality.²⁰⁵ In an informal (or presumptive) rights regime, formal institutions are not present to restrict explicitly or liberate rights.²⁰⁶ Nonactivation is a period of time when the resource at stake is not scarce, meaning the low-intensity use is maintained by default.²⁰⁷ In the *Hudson* conflict, the transactions begin with an informal rights regime and a prolonged period of nonactivation, but this arrangement was altered during the agricultural industrialization period with attendant water pollution. From the post-colonial era to the industrial era, growth and lack of municipal and regional infrastructure allowed sewage and other pollutants to be discharged directly to streams. Population growth and market regime encouraged increasing resource use through the 1800s (timbering and bog iron mining),²⁰⁸ which presumably created small quantities of pollution.

In early America, the privilege holders were landowners that used their land in ways that negatively affected water quality. Based on recent studies that show water quality degradation with deforestation and mining inference, complete timbering of swamp cedar and bog iron mining presumably negatively affected water quality.²⁰⁹ The conflict arises because

²⁰⁴ Daniel B. Klein & John Robinson, *Property: A Bundle of Rights? Prologue to the Property Symposium*, *ECONJOURNAL WATCH* 8(3): 193–204, Sept. 2011; Armen A. Alchian & Harold Demsetz, *The Property Right Paradigm*, *THE J. OF ECON. HISTORY* 33, no. 01, 16–27 (1973); Harold Demsetz, *Toward a Theory of Property Rights*, *LAW AND ECON.*, 341–53 1 (1967). For example, a landowner may have a stream on his property, but the right to use the stream as he wishes may be restricted by local, state, and federal law. The government also has the right (through statute) to collect tax on the property.

²⁰⁵ Duke & Csoboth, *supra* note 4.

²⁰⁶ Commons, *supra* note 94; Bromley, *supra* note 138.

²⁰⁷ Duke & Csoboth, *supra* note 4.

²⁰⁸ Sipple, *supra* note 15; Holden, *supra* note 15.

²⁰⁹ See generally IAN R. CALDER & D. R. MAIDMENT, *HYDROLOGIC EFFECTS OF LAND-USE CHANGE*, MCGRAW-HILL INC., 1992.

interests are in contrast between parties regarding resource use. Water quality degradation constitutes externalities, which occur when one party has the privilege to pollute and no right exists for the other party to stop the pollution. The costs of pollution are borne by society, specifically those who value the low-intensity use. In early America, institutions were not formally in place to process the conflict of increasing water pollution due to various natural resource (land) uses. Also, at this time, the relative value of agricultural and other extractive production likely exceeded the value of a clean environment for the early Americans. As such, during these informal rights regimes, there was likely little political pressure for legislation that altered the status quo to protect the environment and restrain landholders. Presumptive rights would thus persist until pressure grew by the increasing relative social value of water quality as part of the increasing scarcity of clean environments.

2. Formal Rights Regime

Through the first half of the 1900s, only modest institutional change occurred via statutes and regulations, which allocated particular rights and offered limited restrictions on landowners through zoning. It was in the early 1900s, that institutions truly constrained land use behavior that impacted water pollution. Throughout early America in the 1920s, zoning laws and ordinances were used to determine appropriate land uses, which allocated rights among private property owners.²¹⁰ In the Pocomoke Watershed and Worcester County, agriculture was a leading land use, and current zoning reflects high-relative-value agricultural land uses.²¹¹ Zoning ordinances in Worcester County were used to allocate rights to the high and low intensity users through the state and local legislative processes; certain industries were restricted to particular areas (i.e., zones) for early planning purposes.

The federal Water Pollution Control Act (WPCA, 1948) and amendments (CWA 1972, CWA 1987) allocated rights through the federal legislative process—the U.S. Congress.²¹² The WPCA and amendments

²¹⁰ Stuart Kaplow, P.A., *A Brief History of Zoning in Maryland*, (Aug. 2003), http://www.stuartkaplow.com/library3.cfm?article_id=94 (last visited Mar. 15, 2015), *archived at* <http://perma.cc/FPZ6-YYXS>. “There were early land use laws in this country and as early as 1692 Massachusetts towns relegated the location of slaughterhouses to upwind non-residential areas. Later precursors to modern zoning were fire districts, areas in certain cities where wooden buildings were prohibited.” Zoning as a comprehensive institutional restriction on land use came much later in New York 1916.

²¹¹ Maryland Department of Planning Land Use Map, <http://planning.maryland.gov> (last visited Mar. 15, 2015), *archived at* <http://perma.cc/68RD-HD7Z>.

²¹² The Clean Water Act 33 U.S.C. § 1251 et seq.

established a process that could be used to restrict the rights of landholders and provided conditional rights to environmental interests. The CWA began the formalization of rights, thereby removing the presumptive right from high-intensity users and began to require sharing of costs through technology improvements and decreasing emissions. The CWA also required the states to set standards and control pollution in waterways, and contained the provision for low intensity proponents (environmentalists) to identify pollution externalities and object to high-intensity use via quasi-judicial or judicial processes. The WPCA, amendments, and state statutes provided a process to liberate or restrict landowner's rights through the permitting process as described below.

It is well-known that the CWA exempted agricultural nonpoint source discharges directly, however, the EPA's concentrated animal feed operation rules (CAFO Rules 2003–2008) required states to require National Pollution Discharge Elimination System (NPDES) permits for CAFOs, and required land application of manure to be addressed.²¹³ Poultry (and other animals) that are confined and of a certain size (by animal unit or poultry house size) can be considered a CAFO based animal numbers and the configuration of the farmland.²¹⁴ In effect, the agricultural nonpoint source became a point source in need of an NPDES permit by definition when the operation is of a certain size and “. . . is designed, constructed, operated, or maintained, such that a discharge to surface waters of the State WILL occur” through ditches or pipes.²¹⁵ The CAFO rules and other Maryland statutes such as the Water Quality Improvement Act further constrained and allocated formal rights to the low-intensity party.²¹⁶ The state promulgated nutrient regulations that restricted farm landowners (high-intensity users) through requirements for litter handling, farm configuration (ditching piping, spreading) and farm discharge during weather events (storms). Again, the environmental party won some rights through the high-intensity users (poultry and other animal farms) altering their desired production process and bearing costs.

²¹³ Concentrated Animal Feeding Operations (CAFO)—Final Rule, U.S. EPA, <http://water.epa.gov/polwaste/npdes/afo/CAFO-Regulations.cfm#court> (last visited Mar. 15, 2015), *archived at* <http://perma.cc/6KSK-Y2UH>.

²¹⁴ Maryland Department of the Environment, AFO (CAFO/MAFO) Webpage, <http://www.mde.state.md.us> (last visited Mar. 15, 2015), *archived at* <http://perma.cc/B4TE-UY4W>.

²¹⁵ *Id.*

²¹⁶ Maryland Department of the Environment Water Quality Improvement Act—Nutrient Management, <http://www.mdot.maryland.gov/> (last visited Mar. 15, 2015), *archived at* <http://perma.cc/24LD-HAQB>.

Rights were defined for point sources with the enactment of the CWA; conversely, the CWA largely left nonpoint (field) agricultural sources of discharge unregulated. Indeed, following the CWA, the environmental party did not have well-defined rights specifically because CAFO thresholds exclude many operations and because nonpoint sources and agricultural storm water are excluded from regulation.²¹⁷ The latter two sources constitute a recognized majority of agriculture pollution entering the Chesapeake Bay.²¹⁸ In pursuit of the unallocated rights, the environmental party in the *Hudson* case exercised its express right designated in the citizen suit provision of the CWA.²¹⁹ To understand how the CWA and ensuing federal and state regulation do not create a fully formalized (Hohfeldian) rights regime (only conditional rights to the environmental parties), environmental transactions of *Hudson* are detailed below.²²⁰ The citizen suit provision enabled this conflict to reach judicial resolution.

IV. COMPARATIVE INSTITUTIONAL ANALYSIS

Moving from informal to formal rights regimes involves allocation of rights to the parties based on resolution processes through the creation of institutions. The process by which these rights were assigned is important in the comparative institutional analysis below, which will be completed in two steps. Each instance where allocation of rights is possible constitutes a transaction. The transaction outcomes assign rights and are used as in Duke (modifying the method of Komesar) to assess two goals: (1) the Coasean substantive efficiency of the rights allocation; and (2) the procedural fairness of the dispute processing.²²¹

A. *Procedural Fairness*

The assessment of procedural fairness is conducted by evaluating the representation of parties' interests in the conflict resolution process. The parties' characteristics described above are used to assess each party's ability to advocate its positions in the resolution process and point to strengths and weaknesses that affect individual transaction, and ultimately

²¹⁷ Clean Water Act, *supra* note 107.

²¹⁸ National Research Council, *Achieving Nutrient and Sediment Reduction Goals in the Chesapeake Bay: An Evaluation of Program Strategies and Implementation*, Washington, DC: The National Academies Press, 2011.

²¹⁹ Clean Water Act, *supra* note 12.

²²⁰ Hohfeld, *supra* note 138; BROMLEY, *supra* note 138.

²²¹ KOMESAR, *supra* note 10; Duke & Csoboth, *supra* note 4.

resolution process outcomes. In the water-land conflict and *Hudson* case, transaction outcomes and rights allocation in the legislative, moral suasion, quasi-judicial, and judicial resolution processes are examined and assessed for procedural fairness.

1. Legislative

Procedural fairness assessment of the legislative actions include the relevant federal and state statutes: CWA and Water Quality Improvement Act (Maryland nutrient management law). The legislative process creates the institutional structure by which disputants can articulate their interests and compete for formal rights. It also establishes some formal rights and duties such as the requirement that point sources follow NPDES procedures or farmers comply with basic nutrient management planning and implementation.

Prior to the initial water quality statutes, no formal process existed for the environmental party to articulate its interests with respect to environmental quality. Legislative resolution thereby provides a way for the environmentalists' voices to be heard without directly creating the outcome. In addition, the legislative process is a low-cost way, albeit indirect, for environmentalists with low per capita stakes to participate. Similarly, the poultry industry, like all low and medium per capita stakes parties that are source of water quality loadings, now have an ability to defend their practices from legislative constraints. So, the process of creating these statutes offered considerable procedural fairness. The interpretation of the CWA is that the nonpoint sources are largely exempt from control, while the point sources are subjected to a regulatory process. This outcome matches the interests of the two parties here, suggesting that both were able to articulate their interests without securing full rights over one another's uses of the resource at stake. Subsequent statutes, however, tended to increase the regulatory processes available, which tended to support the environmentalists' articulation of their interests. This suggests robust participation by environmentalists. In contrast, the fact that there still is little direct, rigorous statutory control over many nonpoint sources suggests that the poultry farmer party (and agricultural parties in general) also continued to participate fully in the legislative process in the years following the CWA.

2. Moral Suasion

Moral suasion is a resolution process usually used by an environmental group to place pressure on entities that it claims are harming the

environment. It is an informal process in that no formal institutions are created; instead, environmental parties persuade emitters to abate, voluntarily, some level of discharge. In this conflict, the environmental party issued press releases to raise negative profile of poultry party. Information used in the press releases—specifically, that the pile observed during the fly-over was poultry manure and a “mixture of human waste and poultry manure”—that was deemed incorrect in litigation²²² indicates the fundamental imbalance of participation in the moral suasion resolution process. Furthermore, Hudson and Perdue had little ability to correct or challenge the contentions made against their activity. In sum, moral suasion had procedures that did not generate fairness in this conflict. That said, moral suasion is not used because it is procedurally fair. It is not a public forum or other means where both parties participate and are heard. The Waterkeepers group likely saw moral suasion a way to raise awareness and achieve some conflict resolution without having to use formal conflict resolution procedures.

3. Quasi-Judicial

Quasi-judicial resolution processes involve major rules and more specific interactions between the poultry party and the environmental party through the Maryland Department of Environment (“MDE”) visits in December 2010 and January 2011. The poultry party is affected directly by federal and state CAFO/AFO/MAFO rules and regulations. The rule-making quasi-judicial resolution process is governed by institutional protections of procedural fairness within the Administrative Procedures Act (“APA”).²²³ The APA requires the rulemaking process include stakeholder and citizen input before rules are promulgated or to offer affected parties recourse through judicial review if rules are deemed in excess of the agencies’ authority.²²⁴ This key provision attempts to ensure that the voices of different interests are heard during the rule-making process. However, recent analysis suggests there may be serious impediments to

²²² *Hudson*, *supra* note 1, at 13. “After the discovery that the pile on the Hudson Farm was bio-solids, and not chicken manure as first alleged, Phillips and Waterkeepers continued to represent to the press and public that the pile contained a mixture of human waste and chicken manure . . . Phillips continued to state in press releases that the pile contained chicken manure, despite the fact that she had no evidence to support that representation.”

²²³ Administrative Procedure Act, 5 U.S.C. § 706 (2006).

²²⁴ *Id.*

full participation of affected stakeholders.²²⁵ Maryland state regulation has similar public notice and participation requirements in the permit process for CAFO/MAFOs.²²⁶

Indirectly, a host of agency decisions shape the agricultural industry and, in turn, affect the incentives for poultry farmers to select the size and management option on their farms. Formal rights regimes affect the location of processing and marketing facilities, management of the size and configuration of operation, and waste quantity and management. There is also a growing number of incentive-based programs to encourage agricultural operations to retire lands and adopt management practices that decrease nutrient loadings to water bodies. These institutions complicate the analysis of quasi-judicial resolution processing because they do not directly affect the resource at stake and some of these policies are voluntary.

In contrast to the legislative process's more general guidelines on how to assign rights, enforcement activity by MDE directly affected the resource at stake and led directly to the litigation. MDE visits to the defendant's farm were in response to the Waterkeeper's allegation of unpermitted release from improper poultry manure storage on the Hudson property. During MDE's first visit in December 2009, an inspection revealed that the pile was not manure but bio-solids from the Ocean City Wastewater Treatment Plant.²²⁷ The inspection found the poultry areas did not show evidence of discharge.²²⁸ A second visit by MDE on January 26, 2010 included water sampling to determine if the bio-solids pile contributed residual pollution to the water.²²⁹ Hudson was assessed a fine on the first visit for "improper storage," but an administrative judge declined to impose the fine.²³⁰ No fine or other violation was found on the second visit.²³¹ No discharge was observed from the poultry houses; however, the facts of the case suggest that cattle manure was in direct contact with the ditches on the farm.²³² Procedurally, the quasi-judicial process exhibited some fairness to the environmental party because the allegation of

²²⁵ Wendy Wagner, *30 Years of Comparative Institutional Analysis: A Celebration of Neil Komesar: The Participation-Centered Model Meets Administrative Process*, 2013 WIS. L. REV., 671-92, (2013).

²²⁶ MDE, *supra* note 216. Public notice, and potentially public hearings, are part of the Maryland permit process for CAFOs and MAFOs.

²²⁷ *Hudson*, *supra* note 1, at 11.

²²⁸ *Id.*

²²⁹ *Id.*

²³⁰ *Id.*

²³¹ *Id.*

²³² *Id.* at 16-20.

a regulation violation made by the Waterkeepers was investigated. However, from the perspective of Hudson, it may appear procedurally unfair to be targeted with an enforcement action based solely on the complaint of an external party and singled out for enforcement from the broader poultry farming population. Beyond the selectivity of the enforcement, no evidence could be located that the MDE overstepped regulatory authority when investigating and determining apparent or real violation of state or federal law. Waterkeepers allegation of discharge from the “pile” or discharge of “poultry manure” was thoroughly investigated. It is clear from findings of fact that high pollution levels were in water samples taken from the proximal stream by the MDE and the ACT; however, the MDE was responding to the allegation of the point source discharge from a pile or the houses, not the source related to the cattle in the fields.²³³

4. Judicial

There was only one judicial transaction in the *Hudson* conflict. The judicial process was similar to the quasi-judicial process in that the case focused on the violation reported by the Waterkeepers of discharge from poultry manure in waters of the United States. The citizen suit provision allowed the environmental party to access the judicial process directly without relying on quasi-judicial action. This ability to participate contrasts with the coerced participation by Hudson. Despite the ease with which they accessed the process, the environmental party seemed to have difficulty articulating its interests with a compelling argument. The reading of Findings of Fact and Conclusions of Law written by Judge Nickerson reveals that the Waterkeepers were pursuing the wrong source of pollution and were unable to provide a cohesive case.²³⁴ The industry support for the poultry party may have provided more expert support for the defense in as much as maintaining focus on the claim made.²³⁵

B. Substantive Efficiency

The transactions in the formal rights regime allocate rights relative to the resource at stake, which can be analyzed in terms of the goal

²³³ *Hudson*, *supra* note 1, at 16–19.

²³⁴ *Id.*

²³⁵ *The Hudsons' Lawsuit Update, Myth vs. Fact Save Farm Families* (October 2012) <http://www.savefarmfamilies.org/> (last visited Mar. 15, 2015), *archived at* <http://perma.cc/D7EX-V4FN>. This website offers the fact that the Hudsons were responsible for their own representation and Perdue did not provide legal support.

of substantive efficiency. Substantive efficiency will be determined using a Coasean analysis,²³⁶ whereby efficiency is enhanced when rights are allocated to the party that has the highest social value for the resource at stake.²³⁷ As argued above, the poultry party appears to have a higher value for the resource at stake because the resource at stake involved a minimal impact on overall water quality, as it was related only to the Hudson farm. Therefore, processes that tend to allocate rights to the poultry party will tend to produce substantive efficiency.

1. Legislative

The legislative resolution processes tended toward substantive efficiency. Though the statutes establish a process that might restrict industries and firms from unabated pollution, the statutes are not likely to end all activity in any industry. Moreover, statutes tend to put little restrictions on agriculture as a practice (unlike industrial or municipal point sources) and completely exempt nonpoint sources. In sum, the legislative resolution established processes that might potentially be used to benefit the environmental party, but, on balance, they did not entirely restrict the poultry party and thus tended toward efficiency.

2. Moral Suasion

The moral suasion resolution process in the *Hudson* case consisted of using provocative press releases. The press releases in the *Hudson* case were, obviously, to benefit the Waterkeeper interests. Although no rights were allocated in the process, it tended to work against the goal of substantive efficiency because it attempted to assign rights to the lowest-valued user. That said, moral suasion was incomplete. Many of the dormant stakeholders that the Waterkeeper Alliance may have been attempting to sway into action were not activated.

3. Quasi-Judicial

The quasi-judicial process assessed against the goal of substantive efficiency reveals whether the right resides with the highest valued user. In the case of MDE visits, some rights were conditionally assigned to the Waterkeepers when a fine was assessed to Hudson. However, a fine was

²³⁶ Coase, *supra* note 91.

²³⁷ Duke & Csoboth, *supra* note 4.

not imposed in a second inspection. Constraining the large industrial poultry operations defined as CAFOs within the CWA statutory limits tended to allocate rights to the lower-valued user. In sum, the quasi-judicial restrictions on the Hudson were slight, and the conditional rights allocated tended to benefit the poultry party. Therefore, the quasi-judicial process tended to generate substantive efficiency with respect to the resource at stake in the *Hudson* conflict.

4. Judicial

The judicial process assigned rights to Hudson, which resulted in achieving the goal of substantive efficiency. The court questioned the merit of the environmentalist argument, thereby raising the evidentiary bar for future cases. In effect, this protects farming operations from threat of poorly construed accusations and thereby allocates the right to unencumbered operations.

C. *Comparative Institutional Analysis Summary*

The parties' interests are incompatible because intensive agriculture wants to use the same water for discharges that environmentalists want free from excess nutrients. The environmentalists view this high-intensity land use, when manure is spread beyond the capacity of the land to absorb the nutrients, as an impingement on their right to clean water. Waterkeepers want the right to prevent environmental costs by using formal institutions to assign duties to high-intensity agriculture, such as concentrated animal feeding operations, preventing any high-intensity agricultural use that negatively affects water quality. Using the judicial process resulted in the outcome, finding that the Hudsons are conducting permissible operations under the current law.

Comparative institutional analysis of this conflict included comparison of the performance of each resolution process to social goals. The goal of fairness was best achieved in legislative resolution where both parties were represented by catalytic subgroups with access to the process. The quasi-judicial and judicial processes incompletely delivered procedural fairness, and moral suasion was unfair to the poultry party. The legislative, quasi-judicial, and judicial processes tended to be substantively efficient with rights allocated to the highest valued user. The moral suasion process did not result in rights assignment, but, if successful, would have been inefficient. Among the informal processes, prior to conflict activation, the market tended to be efficient but unfair, as the environmental

party did not have the ability to participate. Therefore, this analysis concludes that the legislative process was best positioned to achieve the goals of procedural fairness and substantive efficiency in resolving this particular conflict of discharges from a concentrated animal operation. This analysis should hold lessons for similar agricultural-environmental conflicts at the nexus of land and water.

IMPLICATIONS AND CONCLUSION

This comparative institutional analysis was performed to understand the relative performance of dispute processing following the CWA and ensuing resolution processes that allocate rights to parties involved in environmental conflict over high-intensity land use and water quality degradation. The comparative institutional analysis reveals the resolution process (market, legislative, moral suasion, quasi-judicial, or judicial) that performed the best in terms of the social goals of substantive efficiency and/or procedural fairness. Methods of analysis followed Komesar's participation-centered approach and Duke's transaction analysis at each stage of the conflict.²³⁸ Transaction outcomes and description of the poultry party and the environmental party positions revealed whether the goals of Coasean substantive efficiency and procedural fairness were achieved in each resolution process. If rights were assigned to the highest valued user, in this conflict the poultry party, the result was Coasean efficiency. If each party's position allowed for sophisticated, organized participation in the resolution process, then procedural fairness resulted.

The purpose of the analysis was to examine the resolution process of the environmental conflict issue of "Who bears the external cost of the high-intensity use of the resource at stake?"²³⁹ In the *Hudson* case, the environmental conflict was over intense land use that triggered a challenge by the Waterkeepers. The intent of examining this water-land conflict and case study was to determine if any one resolution process performed better than others when compared with the goals of efficiency and fairness. The legislative resolution process performed the best in terms of fairness and efficiency, but this result may be surprising and difficult to apply in future water-land nexus conflicts. Simply, legislative resolution performed the best but it never addresses, conclusively, nonpoint or other obvious sources such as restrictions on cattle in the field. The judicial and quasi-judicial processes revealed, clearly, that nutrients and bacteria were present in water near the farm, but the outcome validated Hudson's

²³⁸ KOMESAR, *supra* note 10; DUKE, *supra* note 14.

²³⁹ DUKE & CSOBOTH, *supra* note 4.

interests in remaining unrestrained. The judicial result was driven by the relative weaknesses of the environmental party argument and, in effect, recognized the higher social value of the poultry party.

The quasi-judicial processes implemented and enforced rules of the legislative process. The legislative process established the rules of future processes that remedy conflict between the incompatible interests of the two parties. In a previous comparative institutional analysis of environmental conflict, the judicial and quasi-judicial process were fair and efficient and yet the quasi-judicial process was better suited to handle scientific complexity inherent in a complex environmental conflict.²⁴⁰ However, the *Hudson* conflict can be considered “incompletely processed” due to the unpersuasively argued environmental interests, with the arguments framing and pursuing the wrong problem (poultry nutrient and bacteria source as pollutants rather than the actual sources). The case was important in the larger conflict of Chesapeake Bay, but is a poor example of individual conflict resolution. The resolution process resulted in substantive efficiency and procedural fairness but the result of the resolution process did not adequately address the conflict over the resource at stake. Simply assessing either the highest valued use through substantive efficiency or procedural fairness in one case does not address the deeper, larger conflict of recognizing the unallocated rights that are sought by the environmental party. The *Hudson* case is an example of the environmental party inadequately arguing for their interests in accordance with the institutions established by the legislative, quasi-judicial, and judicial resolution process.

The *Hudson* decision leaves the possibility that runoff from agricultural fields could be considered a violation of the CWA. Evidence that juries find agricultural sources (even “diffuse” sources) in violation of the CWA can be found in *CARE v. Southview*.²⁴¹ These cases indicate that the common law movement may be to place agricultural nonpoint source discharges under point source definitions where appropriate, or lead to a clear definition of more sources that clearly generate pollution and can be considered for CWA violation. The path forward for nonpoint sources may be an extension of existing statutory language to include more practices, rather than regulate nonpoint sources under new amendments to law.²⁴² Other paths suggested in the past are more regulatory flexibility

²⁴⁰ *Id.*

²⁴¹ *CARE*, 34 F.3d 114.

²⁴² Terence J. Centner, *Nutrient Pollution from Land Applications of Manure: Discerning a Remedy for Pollution*, 21 STAN. L. & POL'Y REV. 213 (2010).

in instituting the CWA goals and crafting legislation to insulate outcomes from political bias.²⁴³

To move toward resolving the conflict of intensive land use and water quality externality of CAFOs, the quasi-judicial institution should be the best suited to settle disputes through scientifically based application of law. The quasi-judicial institution is moving toward tighter regulation in agriculture and, in the future, Hudson will operate under a NPDES permit. However, the regulators, as with many permit restrictions on discharges, will be limited by the ability to monitor completely the CAFOs and enforce the permit conditions. Sorisio argued that a solution to lax enforcement in the nutrient management regulation by the Department of Agriculture demonstrates the power of enforcement should be with the Department of Environment.²⁴⁴ Some impediments to judicial and quasi-judicial processes were highlighted in this case study and are found in tort cases as well.²⁴⁵ The costs of information for the environmental groups is an important consideration as they prepare their litigation or complaint. Wagner summarizes that even the “‘worst’ regulatory litigation” have value in that they can lower the cost of information for potential future cases by revealing information that may have previously been unobtainable by opposing parties.²⁴⁶ Unfortunately—as pointed out—the Waterkeeper maintained status with erroneous information in pursuit to the only source that was regulated on the Hudson farm, the poultry operation.

In the event another catalytic sub-group pursues litigation, they will (hopefully) be guided by Judge Nickerson’s opinion and should frame their legal and scientific pursuit of rights better. The conflict may be better resolved in the local legislative institution where zoning or other regulation changes mitigate intensive agriculture’s influence on water bodies by requiring buffers. In certain situations, the conflict may be resolved in a market structure where incentives to reduce intensive land use provide farm benefit as well as water quality benefit. These incentives are currently being explored and developed within quasi-judicial institutions and could be structured to provide conflict resolution through market transactions.

²⁴³ David Zaring, *Agriculture, Nonpoint Source Pollution, and Regulatory Control: The Clean Water Act’s Bleak Present and Future*, 20 HARV. ENVTL. L. REV. 515 (1996).

²⁴⁴ Paul L. Sorisio, *Poultry, Waste, and Pollution: The Lack of Enforcement of Maryland’s Water Quality Improvement Act*, 62 MD. L. REV. 1054 (2003).

²⁴⁵ Wendy Wagner, *When All Else Fails: Regulating Risky Products Through Tort Litigation*, 95 GEO. L. J. 693 (2007).

²⁴⁶ *Id.* at 307.