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Achieving Total Compensation for Injuries to Coastal and Marine Resources: The Evolution of Current Valuation and Compensation Methodologies

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Achieving Total Compensation for Injuries to Coastal and Marine Resources

The Evolution of Current Valuation and Compensation Methodologies

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Spring 1992
V. FEDERAL STATUTORY DAMAGES REMEDIES FOR COASTAL RESOURCE INJURIES

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I. INTRODUCTION

America is fortunate to have extensive coastal and marine resources. However, these resources have been subjected to serious assault by human activities. Coastal development continues to take place at a rapid rate and the cumulative effects of this growth on coastal estuaries have yet to be fully realized. Coastal wetlands are known to be essential nurseries for many fisheries and the habitat for numerous animal species. They also function as natural waste removal systems in improving water quality. However, the stresses of development and agriculture have led to major losses of wetland acreage.

Prior to the enactment of recent environmental statutes, common law actions provided minimal protection from environmental pollution. The right of action for nuisance was the primary legal method to deter and redress pollution problems. Actions for trespass, negligence, and strict liability were also used to protect the environment and to achieve compensation for natural resource injuries. These actions

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1 See WILLIAM K. REILLY, Getting Tough on Coastal Pollution, EPA J., Sept.-Oct. 1989, at 8. Such activities as ocean dumping, sewage, non-point pollution, recreational debris, oil spills, and other hazardous wastes are typical pollution problems. Id.

2 See TUDOR T. DAVIES, The Coastal Environment: Estuaries. EPA J. Sept.-Oct. 1989, at 15, 17. Recognition of this fact led the federal government to establish, in 1987, the National Estuary Program to begin comprehensive research and planning for these vulnerable coastal areas. This Act expands the Environmental Protection Agency's previous focus on clean water alone. Id.

3 See Executive Office of the President, U. S., Doc. ENVIRONMENTAL TRENDS, 1, 97 (1989) As many as one half of the saltwater fish and shell fish harvested domestically as well as many fresh water game fish are dependent on tidal wetlands. One third of the North American bird species are found in wetland habitats. Id.

4 DAVIES, supra note 2, at 101.
may still be used in certain instances as the basis of a lawsuit to enjoin a pollution problem or to gain compensation for damages.\(^5\)

Congressional recognition of the need to preserve, protect and manage coastal areas was first legislatively authorized in the Coastal Zone Management Act of 1972 (CZMA).\(^6\) The CZMA incorporates elements of the common law public trust doctrine which had previously been used to preserve certain rights of the public to coastal access and uses.

Liability statutes have now been enacted which provide damage remedies for coastal resource injuries. The Clean Water Act of 1977 (CWA) specifically targets oil pollution of the nation's waters.\(^7\) The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and The Superfund Amendments and Re-Authorization Act of 1986 (SARA) were enacted to reduce the amount of hazardous wastes and toxins in the environment.\(^8\) The 1990 Oil Pollution Act (OPA), passed during the environmental momentum resulting from the Exxon Valdez spill, is expected to have far reaching liability and resource damages provisions.\(^9\) These Acts address the need to control coastal activities and assess compensation for injured or destroyed resources. In the event of a coastal environmental crisis, these laws now provide damage assessment methods for valuation of natural resource injuries. These Acts define the context within which

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coastal and marine resource managers and planners must attempt to achieve recovery of monetary damages, and restoration of the coastal environment.

Economists have developed numerous theories to calculate the total value of natural resources. These methods have been developed and applied over the last two decades. They continue to be refined through application and critique. Resource economists monetarily quantify the values which humans attach to coastal and marine resources. These valuation theories are the subject of much controversy in natural resource damage litigation. An understanding of the evolution of these damage provisions from the early common law actions to the current statutory remedies is essential to those involved in coastal planning, management and litigation. This paper reviews these economic theories and the legal framework in which they are applied.
II. COMMON LAW ENVIRONMENTAL ACTIONS

The common law of the United States of America consists of usages and customs which through case law have been recognized and enforced by the courts. A tort is a wrongful act which injures another and for which a civil right of action exists to redress the wrong. In environmental law, the most important common law tort actions are in nuisance, trespass, negligence and strict liability. In recent years, the "toxic tort" action has frequently been used to gain compensation for environmental injuries.

Individual cases based on these theories were not sufficient to stem the increasing flow of pollution in coastal areas. Therefore, both federal and state statutes have been passed to more uniformly control such activities. However, it is important to understand these common law theories which continue to be used in conjunction with statutory remedies to seek restoration of and compensation for natural resource injuries.


2 See JANET S. KOLE AND LARRY D. ESPEL, EDS. ENVIRONMENTAL LITIGATION, American Bar Association. Chicago: II. (1991). "Toxic Tort Litigation: Theories of Liability and Damages". RICHMAN, HERSHEL J., ALAN KLEIN AND JANET S. KOLE. at 90. These authors note that regulatory agencies which produce statistical data and reports in the course of carrying out their regulatory responsibilities, have aided litigants by providing an enormous amount of information which is useful in these suits. Id.
A. PUBLIC AND PRIVATE NUISANCE ACTIONS

It has been stated that the nuisance case is the foundation upon which environmental law is based. Nuisances are wrongful actions which cause injury to the person or property of others. The essence of the nuisance action is that it is an attempt to limit unreasonable activities which interfere with the use and enjoyment of the property of the complaining party.

Nuisances have also been described as "...that class of wrongs that arise from the unreasonable, unwarrantable, or unlawful use by a person of his own property, either real or personal, or from his own improper, indecent, or unlawful personal conduct, working an obstruction of or injury to the right of another or of the public and producing such material annoyance, inconvenience, discomfort, or hurt, that the law will presume resulting damage."

Two types of nuisance actions are judicially recognized. A private nuisance is an unjustifiable action which unreasonably effects the private property rights of

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4 Id.

another. A public nuisance is an action which effects a right which is common to the general public.

Public nuisances are those activities which are harmful to the general public and as such they are now often proscribed by misdemeanor criminal statutes. These statutes embody the common law public nuisance concept that the police power of the state authorizes proscription of certain activities which are injurious to the public good. Activities which interfere with the "health, safety, peace, comfort or convenience of the general community" are typically the subject of such criminal

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6 Restatement (Second) of Torts 821D-Private Nuisance: A private nuisance is a nontrespassory invasion of another's interest in the private use and enjoyment of land; and, 821E-Who Can Recover for Private Nuisance: For a private nuisance there is liability only to those who have property rights and privileges in respect to the use and enjoyment of the land affected, including (a) possessors of the land, (b) owners of easements and profits in the land, and (c) owners of nonpossessory estates in the land that are detrimentally affected by interferences with its use and enjoyment.

7 SCHNAPF, supra note 3, at 6-2. Restatement (Second) of Torts 821B-Public Nuisance: (1) A public nuisance is an unreasonable interference with a right common to the general public. (2) Circumstances that may sustain a holding that an interference with a public right is unreasonable include the following: (a) whether the conduct involves a significant interference with the public health, the public safety, the public peace, the public comfort or the public convenience, or (b) whether the conduct is proscribed by a statute, ordinance or administrative regulation, or (c) whether the conduct is of a continuing nature or has produced a permanent or long-lasting effect, and, as the actor knows or has reason to know, has a significant effect upon the public right; and, 821C-Who Can Recover for Public Nuisance: (1) In order to recover damages in an individual action for a public nuisance, one must have suffered harm of a kind different from that suffered by other members of the public exercising the right common to the general public that was the subject of interference. (2) In order to maintain a proceeding to enjoin to abate a public nuisance, one must (a) have the right to recover damages, as indicated in Subsection (1), or (b) have authority as a public official or public agency to represent the state or a political subdivision in the matter, or (c) have standing to sue as a representative of the general public, as a citizen in a citizen’s action or as a member of a class in a class action.

An example of a public nuisance would be contamination of public water resources by industrial toxins and wastes. Except in special situations, the proper party to pursue a public nuisance action is a public official such as a district attorney or town solicitor.

A private action for nuisance is a very different type of common law action from one for a public nuisance. The private nuisance action is based on an interference with an individual's or specific group of individual's rights in and use of their private property. In these cases, the rights of each of the parties to the full enjoyment of their property must be weighed and balanced. In most private nuisance actions it is necessary to show that the interference with the property rights of the complaining party was substantial. 10

In a Massachusetts case concerning toxic contamination of municipal wells, the complaining parties alleged that even though the right to clean water was a common right, they had been privately injured when they contracted leukemia as a result of the contamination. They claimed that their special injuries gave them standing in order to sue. The court held that in order to maintain such a cause of action as a result of a public nuisance, it was necessary to prove their "special and peculiar" injuries resulting from the nuisance. The plaintiffs were successful in this case. 11

10 SCHNAPF, supra note 3, at 6-2. Restatement (Second) of Torts 821-F- Significant Harm: There is liability for a nuisance only to those to whom it causes significant harm, of a kind that would be suffered by a normal person in the community or by property in normal condition and used for a normal purpose.
This case demonstrates the difficulty which may be faced by private citizens or environmentalists who try to use public nuisance actions to stop pollution of common natural resources. If the right which is being interfered with is a common one, then usually the proper party is a public official. However, in such cases, it is often private individuals or organizations who wish to bring the pollution to an end. The burden of proof which they must meet as to their "special and peculiar injuries" caused by the pollution is in many cases insurmountable.

Early environmental litigation based on such nuisance claims met with many defenses. The defendants were often successful in raising contributory negligence or failure to assert a timely claim to defeat the complaints against them.\textsuperscript{12} Further, the proper party to bring an action against a public nuisance was often an elected official who could face tremendous political pressures not to litigate such cases.\textsuperscript{13} Recently public nuisance actions have been more successful and in some cases, restoration of damaged land has been required.\textsuperscript{14}

An example of a fact situation in which restoration was ordered took place in Illinois. City and county officials brought a public nuisance suit to enjoin a hazardous chemical waste disposal company from continuing its operation because the site was above an abandoned coal mine which was subsiding. The plaintiffs alleged that the subsidence would cause underground water contamination. Further, the odors and dust from the site were also alleged to constitute a public nuisance. The court found

\textsuperscript{13} Id. at 11.
\textsuperscript{14} SKILLEN, Supplement 1991 supra note 12, at 2.
that the waste disposal site was a public nuisance and that the company could be enjoined from further operations. The court also held that "exhumation of the materials and reclamation of the site is the best and safest alternative."\(^{15}\)

Damages in nuisance cases in which the offensive activity is permanent are usually measured by the depreciation in market value of the realty.\(^{16}\) Some courts also allow for other economic losses incurred as a result of the nuisance. In some jurisdictions it is not possible to receive damages in the amount of the diminution in market value and also obtain an injunction forcing the cessation of the nuisance.\(^{17}\) If the nuisance is impermanent, the measure of damages may include:

1) the depreciation in the rental or use value during the existence of the nuisance  
2) special damages; which may include restoration and repair  
3) damages for personal injuries, and emotional and/or mental distress,  
4) punitive damages \(^{18}\)

Nuisance actions are valuable weapons in the environmentalists' arsenal. However, in many cases it is very difficult to prove that the polluting activity is solely responsible for the injuries alleged by the plaintiffs. This is especially true in cases involving coastal natural resources in which the task of sorting out one source of pollution from another may be Herculean. Despite these drawbacks, these actions continue to be used to supplement statutory remedies.

\(^{15}\) See *Village of Wilsonville v. SCA Services, Inc.* 426 N.E. ed 824, at 841 (Ill. 1981).


\(^{17}\) *Id.* at 145.

\(^{18}\) *Id.*
B. ACTIONS FOR TRESPASS

In environmental cases, the common law actions for trespass and private nuisance are often jointly pursued by the complaining party. This is a result of the fact that in many cases both theories may apply. For example, if stream sedimentation as a result of continuous erosion or excavation caused by a riparian owner interferes with the right to clean water of a neighbor and deposits silt on his property, then both causes of action would be appropriate.19

Traditionally at common law, every unauthorized entry upon another person's property would justify an action in trespass. Over time, this changed in that it became necessary to also prove that the intrusion was intentional and that it interfered with the complaining party's right to peaceful possession of their property.20

At present, an action for environmental trespass to realty may lie based on the intrusion of a thing onto the property of another.21 When particles, such as dust or soot, or underground liquid contaminants are caused to or are permitted to cross into the property of another, the courts have held that a trespass has occurred.22 However, it is required that the trespass actually occur on the land of the complaining party and not solely exist in the air column above it.23

19 KOLE, supra note 2, at 95.
20 SKILLERN, supra note 12, at 13.
21 Restatement (Second) of Torts 158.- Liability for Intentional Intrusions on Land: One is subject to liability to another for trespass, irrespective of whether he thereby causes harm to any legally protected interest of the other, if he intentionally (a) enters land in the possession of the other, or causes a thing or a third person to do so, or (b) remains on the land, or (c) fails to remove from the land a thing which he is under a duty to remove.
22 ARBUCKLE, supra note 1, at 17.
23 YANNACONE, supra note 5, at 82.
Pollution trespass cases are made more difficult by the necessity of proving a clear connection between the unauthorized entry and the alleged harm and as with nuisance actions, if more than one source for the pollutant exists, it may be impossible to successfully maintain a trespass action because of this requirement to precisely prove the exact causative party.24

If the exact causal link can be established, then the trespasser is required to compensate for the full amount of damages to the property. Different states have various damages measurements, however, they usually include:

1) the reduction in market value
2) the value of the loss of rental income or use of the land
3) the cost of restoration.25

The courts generally do not allow restoration costs which exceed the loss of market value as this would give the complaining party a double recovery. However, it is possible to seek punitive damages when the causative conduct is particularly offensive. Further, the courts are empowered to enjoin additional trespasses.26

C. NEGLIGENCE ACTIONS

Environmental harm may result from the actions or omissions of a defendant which fail to meet with the standard of care expected of a reasonable person.27 The

24 SKILLERN, supra note 12, at 13.
25 SCHNAPP, supra note 3, at 6-4.
26 Id.
27 ARBUCKLE, supra note 1, at 18. Restatement (Second) of Torts 282-Negligence defined:
In the Restatement of this Subject, negligence is conduct which falls below the standard established by law for the protection of others against unreasonable risk of harm. It does not include conduct recklessly disregardful of an interest of others; 283-Conduct of a Reasonable Man: The Standard: Unless the actor is a child, the standard of conduct to which he must conform to avoid being
act or omission to act must be the actual cause of the injury to a person or to property in order to be actionable negligence. Further, the negligent act must be the proximate cause of the resultant damages. This element requires that there is no intervening act by another which interrupts the sequence of events set in motion by the negligent party.

One of the essential elements of an action in negligence is that the complaining party must have been owed a duty of due care which is breached by the offending party. Many jurisdictions hold that if the action is in violation of a statute created to prevent such harm that the breach of duty is established and the act amounts to negligence per se.

The doctrine of res ipsa loquitur is also used to establish that a breach of this duty has occurred. Three conditions are required to be present in order to apply this doctrine:

1) The injury or harm would not have happened but for the alleged negligence;
2) The injury or harm was the result of the use of an instrumentality which was solely controlled by the alleged negligent party.

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28 KALO, supra note 8, at 552.
29 SCHNAPF, supra note 3, at 6-4.
30 KOLE, supra note 2, at 91.
31 SCHNAPF, supra note 3, at 6-5.
3) The conduct of the injured party did not contribute to the negligent injury.\textsuperscript{32}

This doctrine may be applied in environmental cases when an instrumentality such as a single point source pollutant is involved, however, it would not be appropriate where many pollution sources are involved because of the necessity of proving that the defendant had sole control of the instrumentality.\textsuperscript{33}

The most common defenses raised by defendants in negligence cases are:
1) That the contributory negligence of the injured party bars recovery of damages. This theory is recognized in a minority of jurisdictions.
2) That the comparative negligence of the injured party should reduce their recovery by the same percentage as their actions contributed to the harm. The majority of jurisdictions recognize this equitable doctrine.
3) That an intervening cause, which happens subsequent to the alleged negligent act was the real proximate cause of the injury; however, the defense is not applicable if the intervening act was foreseeable.
4) That the injured party knew of and assumed the risk of the situation. If successful in proving this defense, the plaintiff would be barred from any recovery.\textsuperscript{34}

One of the major difficulties with environmental actions based on negligence is that it is difficult to establish a generally accepted standard of care which pollution producers owe to possible plaintiffs. The burden of proving that such a duty exists and was owed to the injured party and was breached is formidable in environmental litigation.\textsuperscript{35}

In environmental actions based on negligence, the measurement of damages to real property is dependent upon the type and duration of the injury inflicted. If the

\textsuperscript{32} Id.
\textsuperscript{33} ARBUCKLE, supra note 1, at 20.
\textsuperscript{34} ARBUCKLE, supra note 1, at 20,22.
\textsuperscript{35} KALO, supra note 8, at 552.
injury is temporary, and if the property can be restored to its original condition, then
the measurement of damages is the cost of restoration and/or repair. However, the
cost of restoration may not exceed the market value of the property in its original
condition. Further, the cost of restoration may not exceed the value of the diminution
in market value of the property before and after the harm, which is the proper
measurement of damages in cases in which the injuries are permanent or
irreparable.36

In a North Carolina negligence case arising out of an environmental injury,
the court confirmed this traditional damage valuation. The plaintiffs complained that
the defendant's negligence in grading and paving a road caused siltation and altered a
pond on the plaintiff's property. The court held that this was an impermanent injury
and as such, the proper measure of damages was the cost of repair and restoration
rather than the diminution in value of the plaintiff's property.37

D. STRICT LIABILITY

At common law, strict liability applied to activities which were extremely
hazardous and dangerous. These activities also usually entailed an unnatural use of
land or property.38 The early cases addressed such events as altered water courses or

36 See C.J.S. Damages Section 84 (a), at 924.
38 KOLE, supra note 2, at 92. Restatement (Second) of Torts 519-General Principle: (1)
One who carries on an abnormally dangerous activity is subject to liability for harm to the person,
land or chattels of another resulting from the activity, although he has exercised the utmost care to
prevent the harm. (2) This strict liability is limited to the kind of harm, the possibility of which makes
the activity abnormally dangerous.
explosive blasting which caused ensuing damages to neighboring properties. It was not necessary to prove intent or negligence on the part of the offending party in order for strict liability to attach. Rather, the theory was based on the belief that if a dangerous activity was engaged in for profit, then the commercial enterprise should bear the cost of any resultant harm.

Six factors were considered by the courts in determining whether an activity was abnormally dangerous and therefore subject to strict liability:

1) Did the activity entail a high degree of risk of harm?
2) Was it foreseeable that the damages resulting from the activities would be substantial?
3) Was it impossible to eliminate the substantial risk?
4) Was the activity unusual or uncommon?
5) Was the activity taking place in an inappropriate place?
6) Were the benefits to society less than the potential costs of the harm?

If these inquiries elicited an affirmative response, then the party responsible for the activity would be held strictly liable for the ensuing damages. The amount of the damages would then be calculated by the same methods used in negligence cases.

Many jurisdictions now have judicial precedents or statutes which create strict liability for dangerous activities. Some examples of environmentally harmful activities to which strict liability may attach are the use of, handling of, transporting

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39 SKILLERN, supra note 12, at 14.
40 SCHNAPF, supra note 3, at 6-7.
41 ARBUCKLE, supra note 1, at 21.
42 SCHNAPF, supra note 3, at 6-8. See Restatement (Second) of Torts 520.
43 SCHNAPF, supra note 3, at 6-8.
44 SKILLERN, supra note 12, at 14.
of, or disposal of, hazardous and toxic chemicals and wastes. These commercial enterprises provide a useful service to society however, they are necessarily extremely dangerous and therefore must bear the costs of the harm they create.

F. SUMMARY

The transition from common law to statutory remedies for natural resource injuries began in the early 1970's. Prior to that time the common law actions in nuisance, trespass, negligence and strict liability were used predominantly by individuals seeking redress for injuries to their private property rights. At that time, the environmental movement began to raise the awareness of the public at large to the growing pollution problems which were facing the nation. The common law remedies were inadequate to confront the quickly growing cumulative effects of pollution. It was very expensive and time consuming to attempt to turn back the tide of environmental degradation through the courts on a case by case basis. Individual victories in pollution cases were insufficient to compensate the general public for the social costs which pollution was creating.

The public's growing awareness of the cumulative injuries occurring to the environment and their dissatisfaction with the legislative vacuum controlling pollution eventually led to Congressional action. Initially, federal statutes were passed to provide for preservation and management of coastal resources. Subsequent

45 Kole, supra note 2, at 93.
46 Arbuckle, supra note 1, at 21.
47 Skillern, supra note 12, at 18.
legislation included liability provisions to provide for compensation for and restoration of coastal resources. These statutes were the result of the public consensus that the government should protect its rights in the coastal region. This belief that the public was entitled to such protection had its roots in the common law public trust doctrine.
III. THE PUBLIC TRUST DOCTRINE AND THE COASTAL ZONE MANAGEMENT ACT OF 1972

A. THE PUBLIC TRUST DOCTRINE

Under English common law, the title to lands over which the tide rose and fell was held by the King in trust for the public to preserve their rights of navigation and fishing. This doctrine had its origins in the Roman concept that the seas were incapable of possession and control and therefore were freely usable by all. English common law expanded this concept to protect the navigability of waterways and assure that this transport system could not be infringed upon by riparian owners. Riparian owners could claim the adjacent submerged lands but were unable to use these in a way which would interfere with navigation.¹

In American common law, the public trust doctrine was also used to protect the right of the public to navigation, commerce and fishing in coastal areas and on inland rivers and waterways. One of the earliest US cases which upheld the public trust doctrine was Illinois Central Railroad Company vs. Illinois.² In this case, the Illinois legislature attempted to grant title to submerged lands in the Chicago harbor to the railroad. As a result of adverse public sentiment, a newly elected state legislature subsequently sued to determine title. The case went to the US Supreme Court which held that the trust which the state held on behalf of the public required the state to manage and control the property. The opinion stated in part:

² 146 US 387, 13 S.Ct. 110 (1892).
"...The control of the State for the purposes of the trust can never be lost, except as to such parcels as are used in promoting the interest of the public therein, or can be disposed of without any substantial impairment of the public interest in the land and waters remaining. The State can no more abdicate its trust over property in which the whole people are interested, like navigable waters and soils under them, so as to leave them entirely under the use and control of private parties, except in the instance of parcels mentioned for the improvement of the navigation and use of the waters, or when parcels can be disposed of without impairment of the public interest in what remains, than it can abdicate its police powers in the administration of the government and the preservation of the peace. The soil under navigable waters being held by the people of the State in trust for the common use and as a portion of their inherent sovereignty, any act of legislation concerning their use affects the public welfare."

The public trust doctrine has been expanded in some states to include tidal areas adjacent to non navigable waters. Other states have expanded the protected rights of the public to include hunting, bathing, swimming, anchoring and conservation. Beach access suits have also been successful based on arguments arising from the public trust doctrine.

Individual cases such as those above have used the public trust doctrine to expand the rights of the public in the coastal region. One of the primary duties under the public trust doctrine of the sovereign, and, later of the states, was to protect and manage these coastal resources in trust for the general public. This concept was eventually embodied in the Coastal Zone Management Act of 1972.

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3 13 S. Ct. 110. at 118,120.
5 KALO, supra note 1, at 119.
B. THE COASTAL ZONE MANAGEMENT ACT (CZMA)

The continuing degradation of the nation's coastal resources was finally acknowledged by the Congress and in 1972 the Coastal Zone Management Act (CZMA) was passed. This was not a statute providing for a damages remedy for injury to such resources. However, it was the first step towards such statutory compensation schemes. The CZMA of 1972 provided protection for the public of its right to use coastal resources and reinforced the public trust doctrine by legislatively recognizing the value and importance of these resources.

This legislation was intended to encourage the states to create coastal management programs which would further the national policy to "preserve, protect, develop and where possible, to restore and enhance" the resources of the coastal zone. It was necessary for state programs to meet nine minimum performance standards in order to be approved and receive funding. Once approved, state

9 16 U.S.C. § 1452 (2) (1988). The performance standards were: (A) the protection of natural resources, including wetlands, floodplains, estuaries, beaches, dunes, barrier islands, coral reefs, and fish and wildlife and their habitat, within the coastal zone; (B) the management of coastal development to minimize the loss of life and property caused by improper development in flood-prone, storm surge, geological hazard and erosion-prone areas and in areas of subsidence and saltwater intrusion, and by the destruction of natural protective features such as beaches, dunes, wetlands, and barrier islands; (C) priority consideration being given to coastal-dependent uses and orderly processes for siting major facilities related to national defense, energy, fisheries development, recreation, ports and transportation, and the location, to the maximum extent practicable, of new commercial and industrial developments in or adjacent to areas where such development already exists; (D) public access to the coasts for recreation purposes; (E) assistance in the redevelopment of deteriorating urban waterfronts and ports, and sensitive preservation and restoration of historic, cultural, and aesthetic coastal features; (F) the coordination and simplification of procedures in order to ensure expedited governmental decision-making for the management of coastal resources; (G) continuous consultation and coordination with, and giving of adequate consideration to the views of affected Federal agencies; (H) the giving of timely and effective notification of, and opportunities for public and local government participation in coastal management decision-making; and, (I) assistance to support comprehensive planning, conservation,
programs were empowered through the federal consistency provisions of the CZMA to require that federal agency actions which would directly affect the state's coastal zone be consistent with the state program.\textsuperscript{10} However, in certain cases the Secretary of Commerce, who administers the CZMA through the National Oceanic and Atmospheric Administration (NOAA), has the power to reverse a finding of inconsistency.\textsuperscript{11}

The CZMA has been re-authorized numerous times since its passage in 1972. Most recently this occurred in the Coastal Zone Act Re-authorization Amendments of 1990.\textsuperscript{12} This re-authorization strengthens the federal consistency provisions to include previously excluded activities such as pre-lease activities for outer continental shelf oil and gas leases.\textsuperscript{13} The amendments also recognize that coastal water quality is continuing to deteriorate and requires funded states to prepare a Coastal Nonpoint Source Pollution Control Program.\textsuperscript{14} The 1990 CZMA Amendments also create an enhancement grants program to encourage states to make

\textsuperscript{14} 16 U.S.C.A. § 1455 (6)(a)(1) (West Supp. 1991) These programs will update those required under the Clean Water Act. Further, these amendments authorize the administration of the United States Environmental Protection Agency and the Secretary of Commerce to review the inland boundaries of the state coastal zone in order to assess whether the boundary is far enough inland to reach the sources of pollution which impact the state's coastal zones. 16 U.S.C.A. 1455 (b)(c)(1) (West Supp. 1991).
improvements in their programs in one or more of eight problem areas. Special funds are set aside for qualifying programs. The amendments also authorize the establishment of a Coastal Zone Management Fund to support special coastal projects particularly those which would use the public trust doctrine to implement their programs.

The original Coastal Zone Management Act did not provide for coastal and marine resource damage valuation. However, it did create a national management program which through co-operation with participating coastal state programs continues to protect and preserve these resources. The importance of Congressional recognition of the value of these resources cannot be overstated. This act initiated a management program which continues to attempt to assess and preserve coastal and marine resources. Subsequent legislation, discussed in the following sections.


(1) Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands. (2) Preventing or significantly reducing threats to life and destruction of property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise and Great Lakes level rise. (3) Attaining increased opportunities for public access, taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value. (4) Reducing marine debris entering the Nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris. (5) Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources. (6) Preparing and implementing special area management plans for important coastal areas. (7) Planning for the use of ocean resources. (8) Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities, and Government facilities and energy-related activities and Government activities which may be of greater than local significance. Id. at 52228.


continued this initiative and provided methods of economic valuation and compensation for injuries to these resources. The CZMA laid the groundwork for the regulatory acts requiring valuation which followed.
IV. ECONOMIC THEORIES FOR DAMAGES VALUATION OF NATURAL RESOURCE INJURIES

A. THEORY DEVELOPMENT

1. Common Law Damages for Injuries to Real Property--Environmental injuries to coastal and marine resources continued to occur subsequent to the passage of the Coastal Zone Management Act (CZMA). Resource economists were called upon to assist in valuing natural resources when environmental injuries occurred. Throughout the 1970's and 80's and into the current decade, their theories for valuation of coastal resources expanded the narrow and simplistic common law theory of damages for injuries to real property. At common law, injuries to real property consisted primarily of the following:

1) If the injury was permanent, the damages were the difference between the market value of the property before and after the injury.

2) If the injury was temporary, the damages were the value of the loss of rental income or use of the land and/or the cost of restoration, if it was less than the difference in the value of the property and before and after the injury; further, the cost of restoration was not to exceed the value of the land.

Double recovery of damages was prohibited at common law. Double recovery would, for example, have taken place if a landowner received payment for the permanent depreciation of the property and also for the cost of restoration, or for the decreased rental value.¹

¹ See 25 C.I.S. Damages Section 84(a) at 920-926; Section 84 (b) 928,929.
These common law real property damages provisions were based on the market value of the land and the loss of profits (or rentals) which the land could produce. The rentals or profits were the "services" which the land provided.

2. Utility Values—Traditionally, economic valuation of natural resources was based primarily on the demand for the services which the resource provided. Examples of services provided by coastal resources are consumptive recreation activities such as sportfishing and hunting; and, non-consumptive recreational activities such as bird watching and boating. Other services provided by coastal resources are preservation, commercial fishing, waste treatment, commercial development, transportation, and extractive activities (e.g., minerals, oil). Much of the demand in coastal areas for these services arises from open access uses by the general public. These public uses pose a difficulty for valuation because they are often not clearly market related. If it is an open access use, there may be no charge for the activity, hence, no market for the use. Recreational uses and preservation are public uses for which the demand is for the resource itself. The demand is for the place itself as opposed to a product of the resource.

Private uses of coastal resources, such as commercial fishing and development, differ from public uses in that they use the resource to produce a final product which will be tradeable in the marketplace such as fish and condominiums. Therefore, a monetary indication or market price of their economic value exists.

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3 Id.
4 Id. at 13.
5 Id.
6 Id. at 13.
such cases the demand for the resource itself is derived from the demand for the good in its final form.\(^7\)

Public and private uses are categorized as consumptive or non-consumptive.\(^8\) In some cases the use value or utility value of a publicly used natural resource can be derived from comparable private property values. Often it is helpful to compare the diminution of values following injuries to a public resource and comparable private property.\(^9\) Utility values are similar to the common law damages valuation in that they are based upon a service or product of the resource or a use for which a value is easily establishable in the marketplace. There are a number of behavioral market related methods to monetarily assess utility values. The hedonic method and the travel cost approach are examples of such approaches. These methods and others will be discussed below.

3. **Existence Values**--Utility values do not satisfactorily reflect the total worth of natural resources.\(^10\) Many resources have value beyond their value as used by humans.\(^11\) If this were not true, national parks might be more profitably farmed for timber and national seashores might be converted to development for profit. The existence value of a natural resource is based on the demand which the public has for preservation of natural resources. It has been found through economic surveys and studies that many resources have an existence value which exceeds their utility or service value. Membership dues in environmental organizations such as the Audobon

\(^7\) *Id.*


\(^9\) *Id.* at 282.

\(^10\) *Id.* at 284.

\(^11\) *Id.* at 287.
Society, the Sierra Club and Greenpeace are often cited to as a monetary measurement of the public's demand for preservation. Frank B. Cross, in his 1989 article, "Natural Resource Damage Valuation", proposed that there were three types of existence values:

1) Option value--the value a person places on retaining the option of visiting or seeing a natural resource.
2) Vicarious value--the value that a person places on knowing that a natural resource exists even if they know that they will never visit it.
3) Intertemporal value--the value a person places on preserving natural resources for future generations.

Studies have found that option and existence value are substantial and may account for more than half of the environmental benefits of natural resource in some cases.

4. Intrinsic Value--Existence value is a product of human aesthetics. Intrinsic value is defined as the value which is inherent in natural resources beyond and independent from the value placed on them by humans. However, the acknowledgment that natural resources have an intrinsic value which is independent of human values makes claims for damages very difficult. One difficulty with recovery of damages for intrinsic value is that monetary "value" is defined by human beings and our legislation and is necessarily related to our value system. Those who

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12 Id. at 288.
13 Id. at 285, 286.
14 Id. at 287, 288.
15 Id. at 293.
16 Id. at 294.
17 Id. at 296.
ascribe great intrinsic value to natural resources seem to do so from an ethical rather than an economic viewpoint. Their contention is that the planet and its resources are beyond monetary valuation and that to attempt to reduce the miracle of creation to capitalistic formulas is impossible.18

B. METHODS OF VALUATION

1. Contingent Valuation Method—The Contingent Valuation Method was developed to provide a mechanism for valuing public nonmarket goods. Nonmarket goods are those which are not traded in a recordable market place. Public access natural resources such as national parks or coastal areas are subject to this type of economic valuation. This theory assumes that individuals can respond to questions of value concerning nonmarket goods by indicating their willingness to pay for such goods in a hypothetical market transaction.19 In these surveys, the respondents are expected to reveal their preferences which are contingent on certain quantities and values of goods. In these surveys, questions are posed, such as: "How much would you pay to preserve the nesting areas of sea turtles?" Responses are observed and tabulated to create a demand curve for such resources. There are primarily two types of questions used in contingent valuation surveys.

1) In the first type, the level of a the good is changed by increments, (e.g. 100% pure water; partially polluted water; very polluted water) and the person being surveyed indicates

18 Id. at 294.
by bidding the maximum amount which they are willing to pay for each level.

2) In the second type of question, the person being surveyed may be asked what the minimum amount is that they would be willing to accept for changes in the goods.

3) The third type of questioning requires a "yes" or "no" response to changes in the good available at set prices. This is called the contingent choice method.

The contingent valuation method is very flexible and useful in ascertaining the nonuse values of resources.

Bishop and Heberlein stated in their 1990 article, "The Contingent Valuation Method," that in order to provide usable information, these surveys must contain:

1) Population definition--traditionally only effected user groups were questioned. However, at present, the population of study groups is being broadened to include those who may not be expected to use the resource but may express their opinions as to existence and intrinsic values.

2) Adequate product definition--such that the respondent has a clear understanding of the issue involved.

3) Payment method definition--the respondent must have a clear understanding of the payment proposed; it is best if the payment is as realistic and neutral as possible.

The questions which are proposed must be carefully designed so that the respondent is not biased by the survey itself. The weaknesses of the Contingent Valuation method are:

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20 Id. at 99.
21 Id. at 99,100.
1) **Mechanism design effects**--these would include biases which arise out of the structure of the survey which may influence the response.

2) **Intentional untruthful responses**--these are difficult responses to eliminate, especially if the respondent perceives that their self interest will be served by an untruthful response.

3) **Unintentional non truthful responses**--These are economically non-rational responses which arise in some cases from misperception.

Many contingent valuation surveys reflect another factor which may be inherent to the process. Often these surveys reveal that individuals are willing to accept much more compensation for a public good than they would be willing to pay to replace the good. This result is contrary to the utility theory which would predict that the same amounts would be found using either question since the public good is the same.

Although there are numerous vulnerabilities in the contingent valuation method, it remains a valuable and flexible tool for measuring the value of nonmarket public goods. These response biases are being reduced as survey techniques improve. Coastal and marine resources are appropriate subjects of the contingent valuation method in that they are, in many cases, nonmarket public goods which may have an existence value beyond their utility value. This additional value is arguably

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24 Id.

25 Id. at 527.


27 Id. at 127.
the proper subject of "willingness to accept" questions in contingent valuation surveys.28 The contingent valuation method has been used to measure the value of changes in the environment such as clean air and clean water, and aesthetic goods, such as scenic views, and activities such as preservation of habitats and protection of endangered species.29 Activities and goals such as these are "use" values. Nonuse values are measurable only through this hypothetical market methodology. The major problem that confronts resource economists who support the use of contingent valuation is that the difficulty of eliciting, valid, truthful responses depends in part on human behavior which is understandably variable and subjective.

2. The Travel Cost Method--The travel cost approach was developed as a method to measure the monetary worth of recreation sites.30 Often, these sites did not charge a fee or charged only a nominal one. Therefore, when it became necessary to assess the real value of such resources, a valuation technique was required. This information was used to make decisions such as which sites to improve or close.31 The basic idea of the travel cost method is that it is possible to measure the value of a site to visitors by the amount that they are willing to pay to visit the site. The actual number of visitors from different distances is observed and the value of their travel

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29 O'FIARA , supra note 19, at 100.

30 See MAYNARD M. HUFSCHMIDT ET AL. ENVIRONMENT, NATURAL SYSTEMS AND DEVELOPMENT: AN ECONOMIC VALUATION GUIDE. Environmental Quality Valuation from the Benefit Side. 1983 at 216.

31 Id.
costs and number of visits per capita from each zone are mathematically determined to produce a trip demand curve.\textsuperscript{32}

Concentric circles are drawn from the recreation site and each zone thus created is considered separately for this valuation method. It is assumed that costs within any particular zone to the recreation site are very similar.\textsuperscript{33} A second step in this method produces the aggregate demand curve which predicts the amount of all recreational visitors who would visit at different prices.\textsuperscript{34} One of the problems with this method is that some accommodation must be made for the fact that long distance travelers expend more travel time, which is valuable, and therefore their cost is greater than that based on distance alone.\textsuperscript{35} The greatest strength of this method is that it is based on actual observations of human behavior. One of the other positive aspects of the travel cost method of valuation is that it has been used since the 1940’s and the actual task of gathering the on site information is not very difficult. In fact, surveys often simply record the license plates of the visitors to obtain the raw data for their valuations.

The travel cost method does have some critical drawbacks. This method measures the number of visitors to a recreational site and is considered a "use" value method. It does not capture the nonuse values and may, therefore, undervalue natural resources. Further, the travel cost method only measures the utility value to those who are monetarily capable of visiting the site. This method does not reflect the value

\textsuperscript{32} ANDERSON, supra note 26, at 92.
\textsuperscript{33} Id.
\textsuperscript{34} ANDERSON, supra note 26, at 95.
\textsuperscript{35} Id. at 96.
of the resource to those who are not financially able to visit the area. However, the travel cost approach is a well accepted tool for valuation because it is based on observed behavior.

3. The Hedonic Price Method--The hedonic price method of valuing environmental goods is based on the presumption that the value of property is effected by the quality of the environment. It is assumed that the satisfaction provided by environmental good is reduced by pollution and is reflected in the fair market value of real estate. Likewise, if a home has an excellent water view or fronts on coastal waters, it would be reasonable to assume that the value of such property would be significantly more than that of its inland neighbors. The hedonic price method is based on the assumption that you can infer demand for environmental goods and their values by comparing actual real estate market prices. This methodology has been used primarily to value the expected benefits of improvements in environmental quality. This property value method of valuation requires the following assumptions:

1) That an entire urban area be treated as a single market for housing,
2) That the market is in or near equilibrium.

Assuming the above, then the price of a house can be taken to be a function of its structural characteristics, the neighborhood, and the environmental quality.

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36 CROSS, supra note 8, at 310,313.
37 OFIARA, supra note 19, at 104.
38 Id. at 106.
39 Id.
40 ANDERSON, supra note 26, at 105.
41 HUFSCHMIDT ET AL., supra note 30, at 197.
42 Id.
All of the above variables are inserted into a formula which can then reduce each of the variables to its market price. In this manner, the environmental characteristic can be isolated and a monetary figure can be determined for each level of the good. This regression model has been used to value the effect of such environmental factors as air quality, noise, water pollution, shoreline access, proximity to nuclear accidents, and the threat of earthquakes on the value of residential housing.43

Some studies have been completed which calculate the negative effects of pollution. One study of PCB contamination of the harbor at New Bedford, Massachusetts showed that market values were lower in the more polluted areas. Property values were 9.5%-15% lower in the polluted areas than those for comparable homes in the areas where the water was cleaner.44 However, most hedonic studies reflect the effect on market prices of environmental improvements.

The strength of the hedonic price method is that it is based on actual market transactions. This method requires an enormous amount of data concerning the area under study in order to be truly reflective of the actual values of environmental amenities. The hedonic price method uses private property market transactions to value environmental goods. The value of this methodology to damage assessment in open access coastal areas is that public losses can be estimated by the changes in the value of private property.45

43 OFLARA, supra note 19, at 108.
44 OFLARA, supra note 19, at 106, citing R. MENDELSOHN, ASSESSMENT OF DAMAGES BY PCB CONTAMINATION TO NEW BEDFORD HARBOR AMENITIES USING RESIDENTIAL PROPERTY VALUES. Prepared for Ocean Assessment Division. NOAA. Rockville: MD. (1986).
45 YANG, supra note 2, at 46.
4. Cost-Benefit Analysis--When the government undertakes a project which will effect the environment, it is important that the project be analyzed in such a way to assess all of the possible negative and positive effects of the project. Cost-benefit analysis is used to evaluate public projects. This type of analysis is most valuable when it covers a time period which is long enough to include the entire time that the benefits of a project will continue and that the costs were incurred. The most commonly used technique for comparing investment alternatives requires computation of the net present value of benefits and costs. These figures are arrived at by discounting the future costs and benefits to a present value. The value of a unit of cost or of a benefit is assumed to be more at present than it would be in the future. This is referred to as the time preference of consumption. In order to arrive at an accurate cost-benefit figure when reviewing an environmental project, it is necessary to go beyond a financial analysis which would include only the costs and benefits to investors. It is more appropriate to perform an economic analysis which would include societal costs.

Pollution abatement, habitat restoration, and lost watershed protection are typical environmental externalities with inherent social costs and should be incorporated in an economic analysis of any project which would cause water

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47 Id. at 46.
48 Id. at 41.
49 Id. at 42.
pollution. One of the challenges for environmental cost-benefit analysis is to value the entire economic worth of natural resources. This requires inclusion of the current use and nonuse values as well as the less clear intrinsic values of the environment. Computations which include intrinsic values and indirect use values are necessary to accurately arrive at the total value of natural resources.

Cost-benefit economic valuation of wetlands has been criticized because there is a lack of complete understanding about many of the processes which take place in wetlands and which may comprise benefits. A monolithic approach to wetlands functions and services has also been criticized because the particular locale and physical characteristics of each wetland area make modeling and standard valuation very difficult. Damages to commercial and sport fisheries have resulted from over exploitation of wetlands and ecological changes have occurred in wetlands as a result of man-made pollution and natural competition. Fishery rehabilitation projects to correct such problems have been the subject of cost-benefit analysis. The costs of such fishery rehabilitation programs often result from regulatory reduction of effort.

51 Id. at 16.
53 Id. at 344.
55 Id. at 231.
56 RICHARD C. BISHOP ET AL., "Benefit-Cost Analysis of Fishery Rehabilitation Projects: A Great Lakes Case study." Ocean & Shoreline Management 13. (1990) at 253. Probabilities of events and outcomes were utilized in the Great Lakes Fishery Rehabilitation project to provide possible benefit calculations. Id. at 258.
on the fishery, management programs for research, and enforcement. The benefits to be expected from such a program could be estimated by experts. It is difficult to ascertain the total value of recreational benefits which might arise from such projects. However, it is necessary to incorporate these values if an accurate result is to be reached.

Cost-benefit analysis of environmental projects requires that monetary amounts be assigned to present and future resource values. One of the obvious vulnerabilities of this method in environmental cases is that these values which must be assigned may or may not include the total existence and intrinsic values of the resource. The outcome of the analysis would be directly influenced by such resource valuation choices.

Decisions as to restoration projects are particularly vulnerable to this valuation process. If the government only includes use values in its benefit side total, then the total value of a restored resource will not be factored into the process. If, however, the government includes the nonuse existence and intrinsic values it may well be that the benefits of the restoration project would outweigh the costs and the project would be approved and completed.

5. Summary--In the period since the environmental awakening of the 1970's, economic valuation theories have evolved to provide techniques which are capable of measuring the total value of natural resources. The common law market-related

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57 *Id.* at 254.
58 *Id.* at 255.
59 *Id.* at 260.
60 JOHN A. DIXON AND ANTON D. MEISTER, supra note 33, at 42.
damage remedies have now been expanded to include the nonmarket and nonuse existence and intrinsic values of resources.

These techniques are now being incorporated into the damage remedies of the environmental liability statutes which were enacted to achieve compensation from responsible parties when natural resource injuries occur. These statutes and the litigation which has helped shape these valuation methodologies are changing the monetary values which we assign to our coastal resources.
V. FEDERAL STATUTORY DAMAGES REMEDIES FOR COASTAL RESOURCE INJURIES

A. THE DEVELOPMENT OF RECENT ENVIRONMENTAL STATUTES

Environmental degradation continued to increase, this particularly effected coastal and marine resources, which led to the creation by Congress of statutory remedies for these injuries. These laws create liability and compensation schemes. One of the most important thrusts of these statutes is that they require clean-up of and total compensation for coastal and marine resource injuries by the responsible party. The compensation methodologies provided by these statutes have now changed from a valuation approach which focused primarily on the market related and service values of the resources, to a broader valuation methodology which will now include the nonuse values of these resources.

B. THE CLEAN WATER ACT OF 1977

1. History of Legislation--The first of the more recent statutes to provide for liability for water pollution was the Clean Water Act which was enacted in 1977. It was composed of amendments to the Federal Water Pollution Control Act of 1948. This Act was intended to provide a regulatory framework to "restore and maintain the chemical, physical and biological integrity of the nation's waters." Liability for the costs of removal of spilled oil and other hazardous substances was

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2 Id. at 1251.
waste sites. CERCLA provided remedies for payment of damages for injuries to public access natural resources from releases of hazardous substances. The Act is applicable to many coastal and marine resources. The Act was amended and re-authorized in 1986. CERCLA, as enacted, expanded the common law theory of damages. In CERCLA, the measure of damages Congress anticipated for environmental injuries went beyond a market value concept of natural resource valuation. On the contrary, the Act seemingly authorized restoration cost as the correct measure of damages.

Upon CERCLA's enactment, the Department of the Interior (DOI) was authorized to propose regulations to guide damage assessments of injuries to natural resources. These regulations were initially codified and promulgated in 1986 and

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11 See Puerto Rico v. SS Zoe Colocotron, 628 F. Id. 652, 672-73 (1st Cir.1980), cert. denied 450 U.S. 912 (1981). In this case, a Panamanian oil tanker ran aground on a reef 3.5 miles south of Puerto Rico. The tanker then released more than 5,000 tons of crude oil in an attempt to free the ship. The resulting spill was over four miles long and came ashore in an area of beaches and mangrove forests. The plaintiffs' assessment of the replacement cost of damaged resources was rejected in part because there was no showing that the government actually intended to restore the environment. However, the Court did state that the proper measure of damages would be the costs which could reasonably be expected to restore or rehabilitate the environment. See Yang supra note 9 at 145, 146. See HEIDI WENDEL, Restoration as the Economically Efficient Remedy for Damage to Publicly Owned Natural Resources. 91 Columbia L. Rev. 430-455. (1991).

12 HOPE, supra note 9, at 199.

13 See 42 U.S.C. § 9607 (f)(1) (1988). This section reads as follows: Sums recovered by a State as trustee under this subsection shall be available for use only to restore, replace, or acquire the equivalent of such natural resources by the State. The measure of damages in any action under subparagraph (C) of subsection (a) of this section shall not be limited by the sums which can be used to restore or replace such resources.
revised in 1988.\textsuperscript{14} The DOI regulations, however, reverted to the common law measurement of damages and limited recovery to the lesser of the cost of restoring natural resources or the value of the loss of services provided by the resource.\textsuperscript{15}

2. Type A and Type B Assessments--The CERCLA regulations proposed by the DOI provided for two types of damage assessments. Type A Assessments were to be used for minor incidents. Type B Assessments were to be used for major incidents which would require substantial field observations.\textsuperscript{16} The regulations provided that if an assessment was made using the process set out by the DOI, then the results were presumed to be correct.\textsuperscript{17} This rebuttable presumption imposed a very high burden of proof on offenders who challenged the assessment results.\textsuperscript{18}

A computerized model for Type A Assessment of damages to coastal and marine environments was prepared by consultants and approved by DOI.\textsuperscript{19} The Type

\textsuperscript{14} See 43. C.F.R. § 11.10-11.93 (1991)
\textsuperscript{15} See DAVID MCKAY, CERCLA'S Natural Resource Damage Provisions: A Comprehensive and Innovative Approach to Protecting the Environment. 45. WASH. & LEE L. REV. 1417,1441,1442. (1988). The author points out that the result of this methodology would be that the value of damages assessed in environmental cases may not be sufficient to restore a resource if the services provided by the resource were of little social value; the ecological value of the resource may in such cases be more than the social/service value and yet remain uncompensated. \textit{Id.}
\textsuperscript{17} Id. at 513. See 43 C.F.R. § 11.91 (c) (1991).
\textsuperscript{18} GRIGULUNAS & OPALUCH, \textit{supra} note 16, at 513.
\textsuperscript{19} GRIGULUNAS & OPALUCH, \textit{supra} note 16, at 518. The Natural Resources Damage Assessment Model for Coastal and Marine Environments (NRDA/CME) encompasses the physical fates, biological effects and economic damages for minor incidents. \textit{Id.}
A Assessment rules and model were upheld by the courts in 1989. The economic damages model for Type A Assessments compares the change in use values of the natural resource before and after an incident. It is based on the reduction in services provided by the resource. Both consumptive and non-consumptive use values are included.

Type B Assessment regulations required that the market price method or appraisal method be used to measure lost use values. However, if it was determined that neither of these methods were appropriate for the resource in question, then the assessment could use non-traditional methods of valuation such as travel-cost, hedonic price, and contingent valuation, among others to value the damages to the resource.

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20 See Colorado v. US Dept. Of Interior, 880 F 2d 481, DC Circuit (1989). The court held that the model was valid, however, it remanded the case for DOI to modify the model to incorporate restoration costs and non use values as well as to update use values.

21 GRIGULUNAS AND OPALUCH, supra note 16, at 524,525.

22 43 C.F.R. § 11.83 (c)(1), (c)(2)(1991) (c) Marketed resource methodologies. (1) A determination shall be made as to whether the market for the resource is reasonably competitive. Unless the authorized official determines that the market for the resource is not reasonably competitive, the diminution in the market price of the resource shall be used to estimate the damages to the injured resource. This methodology shall be referred to as the market price methodology. (2) When the authorized official determines that the market price methodology is not appropriate, the appraisal methodology shall be used if sufficient information exists. Damages should be measured, to the extent possible, in accordance with the applicable sections of the "Uniform Appraisal Standards for Federal Land Acquisition" (Uniform Appraisal Standards), Interagency Land Acquisition Conference, Washington, DC, 1973 (Incorporated by reference, see § 11.18). The measure of damages under this appraisal methodology shall be the difference between the with- and with-out injury appraisal value determined by the comparable sales approach as described in the Uniform Appraisal Standards.

23 43 C.F.R. § 11.83 (d) (1991).Nonmarketed natural resource methodologies. (1) Only when the authorized official has determined that neither the market price nor the appraisal methodology is appropriate shall the methodologies listed in this section or those that meet the acceptance criterion in paragraph (d)(7) of this section be used to estimate a diminution of use value for the purposes of this part. (2) If the lost resource is an input to a production process, which has as an output a product with a well-defined market price, the factor income methodology can be used. This methodology should be used to estimate the economic rent associated with the use of a resource.
3. **The Ohio Case**—The Type B Assessment regulations were challenged in the 1989 case of *Ohio v. U.S. Department of Interior*. In this case, ten states, three environmental organizations, a chemical industry trade association, a manufacturing company and a utility company sought review of the regulations promulgated by the DOI under CERCLA. The states and environmental petitioners alleged that the regulations undervalued the damages which were recoverable for spills that injured natural resources. The industrial petitioners claimed that the regulations permitted damage recoveries which were overstated and unjustifiable. The court held that the regulations requiring that the lesser of the cost of restoration

in the production process and is sometimes referred to as the "reverse value added" method. The factor income methodology should be used to measure the in-place value of the resource. (3) The travel cost methodology may be used to estimate a value for the use of a specific area. An individual's incremental travel costs to an area are used as a proxy for the price of the services of that area. Damages to the area are the difference between the value of the area with- and without a discharge-or-release. When regional travel cost models exist, they should be used if appropriate. (4) Hedonic pricing methodologies may be used to estimate the value of a resource. These methodologies can be used to determine the value of non-marketed resources by an analysis of private market choices. The demand for nonmarketed natural resources is thereby estimated indirectly by an analysis of commodities that are traded in a market. (5)(i) The contingent valuation methodology includes all techniques that set up hypothetical markets to elicit an individual's economic valuation of a natural resource. This methodology can determine use values and explicitly determine option and existence values. (ii) The use of the contingent valuation methodology to explicitly estimate option and existence values should be used only if the authorized official determines that no use values can be determined. (6) Unit values are preassigned dollar values for various types of non-marketed recreational or other experiences by the public. Where feasible, regional unit values and unit values that closely resemble the recreational or other experience lost should be used. (7) Other nonmarketed resource methodologies that measure use values in accordance with willingness to pay, in a cost-effective manner, are acceptable methodologies to estimate damages under this part.

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24 See *Ohio v. U.S. Department of Interior*. 880 F. 2d 432 DC Cir. (1989). See also Denis Swords, *Ohio v. United States Department of the Interior: A Contingent Step Forward for Environmentalists*. 51 La. L. Rev. 1369, 1370 (1991). The author concludes that the court's decision in Ohio was in error, particularly as to the instructions on remand to the DOI to include non use values to be determined by the contingent valuation method.
or lost-use value be assessed in Type B major incidents was contrary to the intent of CERCLA. The Court stated in part that:

"...Congress established a distinct preference for restoration costs as the measure of recovery in natural resource cases. This is not to say that DOI may not establish some class of cases where other considerations—i.e., infeasibility of restoration or grossly disproportionate cost to use value—warrant a different standard. We hold the "lesser of" rule based on comparing costs alone, however, to be an invalid determinant of whether or not to deviate from Congress' preference."

The DOI was ordered to revise the regulations to conform with the court's ruling that restoration costs were the best measure of natural resource damages and to eliminate the specific hierarchy of methodologies for valuing lost use which had been required by the regulations.

4. Review of Newly Proposed Rules—The proposed revisions of the DOI regulations concerning Type B Assessments clearly state that the costs of restoration of the natural resources is the preferred measure of damages. The new rules allow the trustee to propose alternatives for "restoration, rehabilitation, replacement and/or acquisition of equivalent" actions to be taken under CERCLA. The value of lost services during the period of restoration will also be recoverable.

26 880 F. 2d 432, at 459.
28 Id. at 19755.
29 Id.
30 Id.
This revision changes the "lesser of" rule which would have compared the lost use values to the restoration costs.\(^{31}\)

The revision of the regulations expands the kinds of uses or services of the resources which should be included in the measurement of damages.\(^{32}\) The DOI rules originally provided for recovery of nonuse values only if no direct uses of the resource could be found.\(^{33}\) Further, the hierarchy of economic valuation methodologies is to be deleted in the new rules.\(^{34}\) Following the Court's guidance, the new rule would allow the use of any reliable methodology.\(^{35}\)

The new rules have been drafted to ensure that the full value of the resource will be captured in the damage recovery.\(^{36}\) However, if a competitive market exists for the resource, the DOI still gives precedence to the market price methodology.\(^{37}\) The proposed regulations recognize that even when a competitive market exists, the market price methodology may not encompass the total value of the resource. If nonuse values also exist, then the new DOI regulations call for the contingent valuation method to be used to monetarize such injuries.\(^{38}\) The new rules continue to allow the use of travel cost and hedonic price, economic valuation methods, among others, to calculate lost use values.\(^{39}\) Following the courts ruling, the new DOI rules state that

\(^{31}\) Id. at 19756.
\(^{32}\) Id.
\(^{33}\) Id.
\(^{34}\) Id. (to be codified at 43 C.F.R. § 11.83).
\(^{35}\) Id.
\(^{36}\) Id.
\(^{37}\) Id.
\(^{38}\) Id.
\(^{39}\) Id. at 19759.
Option Values and Existence Values are to be recoverable under CERCLA. These non-use values and the previously included use values will together be designated as the "compensable value" of the resource in the new rules. The definition of compensable value is:

"...the amount of money required to compensate the public for the loss in services provided by the injured resources between the time of the discharge or release and the time the resources and the services those resources provided are fully restored to their baseline condition. The compensable value includes the value of lost public use of the services provided by the injured resources, plus lost nonuse values such as option, existence, and bequest values. Compensable value is measured by changes in consumer surplus, economic rent, and any fees or other payments collectable by the government or Indian tribe for a private party's use of the natural resource; and any economic rent accruing to a private party because the government or Indian tribe does not charge a fee or price for the use of the resource. Compensable value does not include any losses related to secondary economic impacts caused by the discharge or release."

These revisions have the effect of broadening the scope of damages recoverable in natural resource incidents which are controlled by CERCLA. The various economic valuation methodologies discussed above have to some extent been legitimized by the deletion of the methodology hierarchy. It is reasonable to assume that the costs incurred by violators of CERCLA will be substantially increased as the result of these changes. It was originally anticipated that the new rules would be

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40 Id. at 19760.
41 Id. at 19772 [to be codified at 43 C.F.R. § 11.83 (c)(1)].
42 Id.
promulgated as of March or April 1992. However, due to the January 1992 Presidential moratorium on all new regulations which also requires a cost-benefit analysis of any new regulatory schemes, it is now more likely that the new rules may not be promulgated until September 1992.

D. THE OIL POLLUTION ACT OF 1990

1. History of Legislation--The *Exxon Valdez*, an oil tanker, ran aground on the Bligh Reef in Prince William Sound, Alaska, on March 24, 1989. The resulting spill of 11.2 million gallons of crude oil was the largest spill in United States history. This spill caused massive wildlife mortality. Study plans for restoration implementation projects indicate that harm to the ecosystem is continuing and that habitats for both land and marine species remain damaged.

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43 Telephone Interview with David Rosenberger (an author of the proposed CERCLA regulations), employed by the United States Department of Interior, Office of Environmental Affairs, Washington, DC. (February 28, 1992).

44 Telephone Interview with Mary Morton, Regulatory Specialist, United States Department of Interior, Office of Environmental Affairs, Washington, DC. (April 30, 1992).


46 See NOAA, *Summary of Injuries to Natural Resources as a Result of the Exxon Valdez Oil Spill* 56 Fed. Reg. 14690-91. April 11. 1991. The following are mortality estimates provided by Exxon: 1) 3,500-5,500 Sea otters 2) 200 harbor seals 3) 13 killer whales 4) 260,000 to 580,000 birds 5) 144 Bald eagles (carcasses found), estimated that several times this number actually died 6) 2000 sea ducks (carcasses found) 7) Fisheries studies are ongoing as mortality in many hatcheries was very high, as much as 50 to 70% in some streams.

The litigation which arose from this incident ended in October of 1991 with the United States and Alaska settling their claims against Exxon for the sum of $900 million dollars; clean-up costs borne by Exxon were 2.1 billion through August of 1991.\(^{48}\)

The *Exxon Valdez* event spurred Congressional action on oil spill legislation.\(^{49}\) The Oil Pollution and Control Act of 1990 (OPA) was signed into law on August 18, 1990.\(^{50}\) This new Act establishes:

1) A plan for prompt response to spills\(^{51}\)
2) A clean up/damage fund (up to $ 1 billion)\(^{52}\)
3) Liability and compensation provisions.\(^{53}\)


\(^{50}\) The Act was passed by a unanimous vote. See THOMAS J. WAGNER, *The Oil Pollution Act of 1990: An Analysis*, 21 J.MAR. L. AND COM. Oct. 1990. 569. The author is critical of the OPA. In his opinion it should have preempted state liability laws and incorporated international conventions concerning oil spills. *Id.* at 587.

\(^{51}\) See PAUL EDELMAN, *The Oil Pollution Act of 1990*, 8 PACE ENVTL. L. REV.1, 17-18. A spill response plan is now in place which stresses prevention. It is required that tank vessels take part in the Coast Guard Vessel Traffic Service (VTS). Under the CWA, a National Contingency Plan for oil spills had been created, however, the *Exxon Valdez* spill showed this plan to be inadequate. Further, the OPA requires the oil industry to prepare oil spill response plans to be submitted within 30 months of the passage of the Act. To accommodate this requirement, the industry created the Marine Spill Response Corporation. This organization will fund five regional centers and twenty-three staging areas to respond to spills. *Id.* at 19.

\(^{52}\) *Id.* at 15.

\(^{53}\) See 33 U.S.C.A. § 2704 (a), (1)-(4) (West Supp. 1991). The new liability and compensation provisions place a limitation of $ 10 million on liability for removal costs for tanker vessels greater than three thousand gross tons. For smaller tanker vessels the liability maximum is $ 2 million. for other vessels the limitation liability is set at $ 600 per gross ton or $ 500 thousand dollars, whichever is greater. Offshore facilities have a maximum liability of $ 75 million; onshore
4) Vessel operation safety standards.\textsuperscript{54}
5) Requirements for double hulls.\textsuperscript{55}

The OPA was enacted by Congress to provide for more comprehensive prevention, response, and removal capabilities than had existed under the varied federal laws in existence at the time of the Exxon Valdez spill.\textsuperscript{56} That crisis highlighted the glaring inadequacies of the patchwork of laws which would take effect in the event of catastrophic oil releases.\textsuperscript{57} This attempt by Congress to assure that responsible parties would be held monetarily accountable for their actions which caused environmental harm included specific recognition that natural resources were valuable and that full compensation for injuries to them would be required.\textsuperscript{58} This compensation is to be assessed and valued according to regulations which are to be promulgated by NOAA pursuant to the OPA.\textsuperscript{59}


\textsuperscript{55} OPA amended the Title 46 Shipping Regulations to provide for more stringent construction standards and for the gradual transition to double-hulled tankers. See 46 U.S.C.A. § 3701-3718. (West Supp. 1991).


\textsuperscript{57} Id.

\textsuperscript{58} Id. at 736.

\textsuperscript{59} Id. at 737.
2. Provisions for Natural Resources Damage Assessment and Valuation in Oil Pollution Act of 1990.—The OPA provides for damages to be recovered from responsible parties when natural resources are injured.\(^6\) The measurement of natural resource damages is:

(A) the cost of restoring, rehabilitating, replacing, or acquiring the equivalent of, the damaged natural resources;
(B) the diminution in value of those natural resources pending restoration; plus
(C) the reasonable cost of assessing those damages.\(^6\)

The Act provides for the appointment of a trustee to pursue the damages.\(^6\) It is specifically stated in the Act that double recovery for environmental injuries is prohibited.\(^6\)

Regulations which will provide a framework for damage assessment under OPA are to be promulgated on or before August 18, 1992.\(^6\) The Act also provides that any determination or assessment of damages to natural resources which is made

\(^{6}\) 33 U.S.C.A. § 2701 (20)(West Supp. 1991) defines natural resources as "land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of the exclusive economic zone), any State or local government or Indian tribe, or any foreign government". Liability may attach for injured natural resources; those damages are listed under 33 U.S.C.A. § 2702 (b)(2)(A) as follows: Damages for injury to, destruction of, loss of, or loss of use of, natural resources, including the reasonable costs of assessing the damage, which shall be recoverable by a United States trustee, a State trustee, an Indian tribe trustee, or a foreign trustee.

\(^{61}\) Id. § 2706 (d)(1)(A)-(C) (West Supp. 1991).

\(^{62}\) Id. § 2706 (b) and (c) (West Supp. 1991).

\(^{63}\) Id. § 2706 (d)(3) (West Supp. 1991). is as follows: There shall be no double recovery under this chapter for natural resource damages, including with respect to the costs of damage assessment or restoration, rehabilitation, replacement, or acquisition for the same incident and natural resource.

\(^{64}\) 33 U.S.C.A. § 2706 (e)(1) (West Supp. 1991). The Under Secretary of Commerce for Oceans and Atmosphere, is charged with the responsibility for creating these regulations. The Administrator of the Environmental Protection Agency and the Director of the U.S. Fish and Wildlife Service and the heads of other affected agencies are to be involved in this process. Id.
in accordance with those regulations shall have the force and effect of a rebuttable presumption on behalf of the trustee in any administrative or judicial proceeding under the Act.\textsuperscript{65} Under CERCLA, the trustee was also granted a rebuttable presumption which was contingent upon the trustee following the assessment model provided for in the regulations promulgated by the DOI.\textsuperscript{66}

The methods of valuation to be used in the OPA damage assessment regulations are expected to be consistent, as far as possible, with those of the DOI under CERCLA.\textsuperscript{67} However, Congress did not intend that the new NOAA regulations be limited by the methodologies of CERCLA.\textsuperscript{68} On the contrary, the new OPA regulations are to improve upon the DOI methodologies and not be restricted by them.\textsuperscript{69} This congressional intent is made clear in the following quote from the Senate Report concerning the bill:

"This bill as amended is intended to be consistent with the recent unanimous decisions of the U.S. Court of Appeals for the District of Columbia Circuit in \textit{State of Ohio v. Interior}, No. 86-1529, and in \textit{State of Colorado v. Interior}, No. 87-1265, reversing the Interior Department's narrow market value and use value based approach to assessing damages (that had been used, for example, to put a $15 price tag on fur seals), and upholding the rules' advanced valuation provision. However, in requiring NOAA to issue new regulations, it is intended that NOAA adopt advanced techniques to assess damages consistent with the above-described measurement of damages. NOAA's rules will be applicable to all oil spills covered by the regulations."
Act, and should streamline trustees' tasks in assessing and recovering full damages. The techniques need not be limited to state-of-the-art computer models (as included in Interior's rules), but may include, for example, tables estimating restoration, replacement, and lost use of other values of the lost or injured resources. The existing Interior Department rules, as amended by the court's decisions, may be used with a rebuttable presumption in the interim. The bill prohibits double recovery of damages, but is not intended to preclude state and federal trustees from conducting parallel assessments, although it is our intent that all trustees work together to minimize duplication of effort. The bill makes it clear that forests are more than board feet of lumber, and that seals and sea otters are more than just commodities traded on the market. It would clarify that in the wake of spills like the Exxon Valdez, all reasonable demonstrable natural resource damages caused by a spill are paid by the responsible parties, rather than borne by the public.\textsuperscript{70}

Particularly in so far as the CERCLA Type A Assessment computer model program is concerned, Congress anticipated in the OPA that NOAA will be more creative in assessing monetary damages for environmental injuries.\textsuperscript{71}, Until the NOAA regulations are promulgated, however, the DOI regulations are to be followed by trustees in oil spill assessments.\textsuperscript{72}

In order to receive public comments on the proposed regulations, NOAA has held hearings in numerous locations.\textsuperscript{73} Comments have been received from

\textsuperscript{70} Id.
\textsuperscript{71} Id.
\textsuperscript{72} Id.
environmentalists, economists and industry representatives.\textsuperscript{74} At this time it is anticipated that the rules will be published by August 1992.\textsuperscript{75}

The anticipated natural resource damage assessment and valuation provisions of the OPA will culminate a Congressional process which now recognizes that coastal and marine resources have values which are greater than those which could be calculated by using utility values alone. This Act heralds an era of total compensation for resource injuries. This comprehensive valuation is necessary in order to require full compensation for abusive uses of and accidental injuries to the coastal and marine environment.

\textsuperscript{74} See telephone interview, supra note 67.
\textsuperscript{75} See telephone interview, supra note 67.
VI. CONCLUSION

At common law, environmental injuries could be redressed through actions for public and private nuisance, for trespass, in negligence and for strict liability. If successful, minimal compensation was received for damages to real property. These damages were strictly related to the change in market value and the lost services of the property.

In the last two decades, environmental law has been a very active and dynamic area of study. Natural resource damage assessment and valuation has recently been in a process of rapid change and growth. There has been increasing public and Congressional awareness of the need to make those who injure natural resources fully accountable for their deeds. This accountability has grown in definition to include compensation for the total values humans associate with resources.

This process began with the Coastal Zone Management Act (CZMA) of 1972 which was not a liability statute, however, it embodied Congressional recognition of the importance of preservation and management of coastal and marine resources. The Clean Water Act (CWA) of 1977 focused on liability for oil related injuries to these resources. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 and Superfund Amendments and Re-Authorization Act (SARA) of 1986 established the economic regulations which are now used to assess monetary damages for injuries to natural resources. This momentum continued when the courts further clarified the necessity for full compensation in the Ohio case.
It is anticipated that the Oil Pollution Act (OPA) of 1990 will create a regulatory scheme which will require that violators be held fully responsible for the total value of the resources they harm.

An assessment of the total value of natural resources begins with the products of and services of the resources. However, it is now recognized that natural resources have enormous values over and above their utility values. The new regulations which require that violators be held accountable for nonuse values including option, existence, and intrinsic values of natural resources may in fact multiply many times their liability exposure. The monetary valuation of these liabilities is being improved upon by creative economic theories such as contingent valuation, the travel cost method, the Hedonic valuation method, and by cost-benefit analyses which include all societal costs.

Coastal and marine resources are finite natural resources which are under tremendous population and growth pressures. In both market and nonmarket methodologies, ocean related resources are rapidly increasing in value. Through the new natural resource damage regulations the costs of doing business in these areas may now begin to fully reflect the societal costs of the uses and abuses of the environment. Resource economists can evaluate the worth that our society places on natural resources. Congressional approval of their methodologies is clearly evidenced in recent legislation.

Those involved in coastal and marine management and planning now have Congressional consent and authority to require full compensation for injuries to natural resources. It is now the responsibility of those involved in coastal
management to use these valuation methodologies to require total compensation when environmental events injure the finite coastal resources of this country.
BOOKS


PERIODICALS


Citizen News-Record, A Park Newspaper. (Aberdeen, NC) "Policy may Jeopardize Wetlands" Associated Press. August 11, 1991. 1,2 <A>


Jaworski, Carole. (Rhode Island Sea Grant Program) "Close Call! The Narragansett Bay Oil Spill". NOR'EASTER. Fall 1989. 16-21.


PUBLISHED REPORTS AND PROCEEDINGS


USDI/Federal Water Pollution Control Administration. The National Estuarine Pollution Study VOL. II. A Report to the Congress. November. 1969.


