

GOVERNMENT LIABILITY AND CLIMATE CHANGE: SELECTED ISSUES FOR WETLAND AND FLOODPLAIN MANAGERS



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PREFACE

This paper is one of several by the author to help government wetland and floodplain managers understand their potential legal liability for failing to consider climate change in their programs or for incorporating strengthened flood loss reduction standards reflecting climate change in their zoning, building codes, subdivision and other regulations.

This paper more specifically addresses the following legal issues:

1. Could wetland and floodplain managers be liable for failing to consider climate change in their policies where such failure increases flood damages to other properties (e.g., accelerated loss of beaches and dunes, erosion, over-topping of levees, breaching of dams, loss of wetland protection and restoration areas which provide flood storage, etc.)? If so, under what legal theories and under what circumstances?
2. Are governments potentially liable for tightly regulating development in flood hazard areas with flooding caused by or worsened by climate change? Would such regulations “take” private property without payment of just compensation?
3. If governments are potentially liable in either situation, how can they reduce potential liability?

The paper draws upon papers and webinars by the author and others:

Jon Kusler, Esq. and Virginia Burkett (1999), *Climate Change in Wetland Areas, Part I: Potential Wetland Impacts and Interactions*, Association of State Wetland Managers, and the National Wetlands Research Center (USGS).

Jon Kusler, Esq. and Virginia Burkett (1999), *Climate Change in Wetland Areas, Part II: Carbon Cycle Implications*, Association of State Wetland Managers and the National Wetlands Research Center, USGS (1999).

Jon Kusler, Esq. and Virginia Burkett (1999). *Wetlands and Climate Change - Scientific Approaches and Management Options*, National Wetlands Research Center, USGS, Environmental Law Institute, Volume 21, Number 2 (March-April 1999).

A portion of the material contained in the paper which follows was developed by the author as part of a larger book: Jon Kusler, *Government Liability for Flood Hazards* (2016)

For other books, papers, and reports addressing government liability for failing to take into account climate change see Jennifer Klein, (2015) *Potential Liability of Governments for Failure to Prepare for Climate Change*, Columbia Law School; Willis Hon (2013) *5th Circuit Reverses Itself on Hurricane Katrina Liability Lawsuit*

For an excellent and comprehensive list and analysis of court cases addressing climate change litigation see the Columbia Law School Sabin Center for Climate Change website.

<http://web.law.columbia.edu/climate-change/resources/climate-change-laws-world>

See also an excellent recent book: Michael Gerrard (ed.), (2016) *Global Climate Change and U.S. Law*, American Bar Association

For other papers concerning government liability for increasing flooding prepared by the author or by the author and the Association of State Floodplain Managers and The Association of State Wetland Managers see Jon Kusler, Esq. and Ed Thomas, Esq., *NAI and the Courts: Protecting the Property Rights of All Updated* (2008); Jon Kusler, Esq., *A Comparative Look at Public Liability for Flood Hazard Mitigation* (2009); Jon Kusler, Esq., *Professional Liability for Construction in Flood Hazard Areas* (2007). Jon Kusler & Sam Riley Medlock, *Flood Risk in the Courts: Reducing Government Liability While Encouraging Government Responsibility* (2012). These are available as “legal papers” on the Association of State Floodplain Managers web site: <http://www.floods.org/index.asp?menuID=301&firstlevelmenuID=188&siteID=1>.

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Editorial assistance by Sharon Weaver and Marla Stelk is also much appreciated. And, so is overall project guidance by friend and colleague Jeanne Christie, Executive Director of the Association of State Wetland Managers.

The paper should not be considered “legal advice” because case law, statutes and regulations vary from state to state. For specific legal advice you should contact a lawyer in your jurisdiction.

Cover Photo by: Jeanne Christie, ASWM

SUMMARY, RECOMMENDATIONS

There is broad scientific consensus that climate change is occurring. Most scientists agree that this change will, in some instances, cause substantial increases in sea level, ground water levels and the levels of inland lakes, rivers and streams and other inland water bodies. They broadly agree that this will increase not only the depth of flooding on both public and private lands but also the duration of flooding and associated erosion. Governments may increase flood damages by failing to anticipate climate change (e.g., failing to elevate houses) in their programs and policies.

No court has yet held a governmental unit liable for damages for failure to reflect climate change in its programs or policies with resulting increased flood damages. However courts have widely held governments liable in cases involving more traditional flooding and erosion for increasing flood damages on upstream, downstream or adjacent lands. And, successful suits with climate-change elements or based primarily on climate change where flooding and damages caused by government actions or inactions are increased or would not ordinarily occur may be expected in the coming years. This is particularly true where scientific studies quantify climate change and increases in the frequency and intensity of flooding and where flooding and flood damages due to climate change are combined with flooding from more traditional flooding and erosion.

To reduce flood damages from climate change, governments can strengthen their floodplain regulations including revised floodplain maps, increased flood proofing elevations, and broadened floodways and coastal high velocity zones. However, some of these regulations will likely be challenged by private landowners as a taking of private property without payment of just compensation. Based upon the broad support courts to date have given to more traditional floodplain regulations and the growing scientific consensus concerning climate change, courts are likely to uphold such climate-change related regulations.

Looking to the future, climate-related natural hazards will be increasingly quantified, foreseeable and predictable with improved computer models and global and regional monitoring. As this occurs, governments may be held liable for flooding in areas which have not previously flooded and/or for exacerbating existing flood problems. Governments need to be particularly careful with their policies for areas behind dikes, dams, and levees where catastrophic losses may occur if design frequencies are exceeded and the legal doctrine of “strict liability” may apply.

All levels of government may be sued under common law “tort” or Constitution theories for causing or exacerbating climate-related flood problems but local governments are particularly vulnerable as they design and operate storm water systems and undertake other activities (construction of dams, levees, fills, ditches, culverts, highway construction) where they may increase flooding and erosion on some private lands while reducing it on others. Their failure to take climate change into account may be considered by a court to be “unreasonable” and “negligent” conduct, particularly where there is a high concentration of risk factors.

To reduce potential liability based upon claims of negligence (“unreasonable” conduct) or other legal theories (“nuisance”, “trespass”, “taking”, etc.) governments should reflect climate change in their policies and programs and take measures to address climate change of the sort suggested in the text below and Box 1. These actions would not only reduce the potential for successful climate change-related suits but also the potential for litigation based on more traditional types of flooding and erosion. They could do so with confidence that courts will uphold floodplain regulations reflecting climate change although courts in a small number of cases have held more traditional floodplain regulations which deny all economic use of land a taking of private property without payment of just compensation. Governments can take a variety of measures suggested below to reduce the potential for courts to hold that tight regulations adopted to reduce climate change-related flooding and flood damages are a taking.

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INCREASES IN FLOOD DAMAGES DUE TO CLIMATE CHANGE

Increasing Flood Hazards

On September 27, 2013 The International Panel on Climate Change (IPCC) released a summary of its fifth assessment report on climate change¹. The summary concludes that

Warming of the climate system is unequivocal, and since the 1950's, many of the observed changes are unprecedented over decades to millennia.

....

Human influence on the climate system is clear. This is evident from the increasing greenhouse gas concentrations in the atmosphere, positive radiation forcing, observed warming, and understanding of the climate system.

....

It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century. There is a 95% probability that human action is the dominant cause of climate change. This represents an increase in certainty from 90% in the previous report.

....

Continued emissions of greenhouse gases will cause further warming and changes in all components of the climate system.

This summary report predicts that there will be a probable temperature rise by 2100 of 1.4 to 4 degrees C, increases in heat waves are very likely to occur more frequently and last longer, and sea level rise will very likely occur faster than between 1971 and 2010. Recent predictions have increased these estimates due, in part, to the melting of the West Antarctic Ice Sheet. See <http://www.nbcnews.com/science/environment/west-antarctic-ice-sheets-collapse-triggers-sea-level-warning-n103221>

The IPCC predicts that climate change will result in a rise in sea level between 0.6 and 2 feet (0.18 to 0.59 meters) by the end of this century.² Other estimates are much higher.³ There has

¹The International Panel on Climate Change (IPCC)'s Fifth Assessment Report On Climate Change released in part on September 27, 2013.

²See IPCC, 2007: Climate Change 2007: Impacts, Adaptation and Vulnerability . Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E. (eds.)]. Cambridge University Press, Cambridge, United Kingdom, 1000 pp.

³See footnotes 1 and 2 above. See also Pilkey, Orrin and Keith Pilkey, Global Climate Change: A Primer (2011); Pilkey, Orrin and Rob Young The Rising Sea (2009). Orrin Pilkey has written in an article originally published in News and Observer (Durham) which states that:

Western Carolina University's Rob Young and I have argued that seas will rise at least 3 feet in this century and that, for coastal management purposes, a rise of 7 feet (2 meters) should be utilized for planning major infrastructure. While some question our recommendation, consider that:

- A blue ribbon panel of scientists from Miami, the U.S. city considered most vulnerable to sea level rise (in terms of property damage) , predicted that the sea will rise a minimum of 3 to 5 feet by 2100.

already been an increase in the number of severe precipitation events over many areas. A United Nations report suggests that by the end of the century severe heat events will increase by a factor of ten.⁴ The IPCC has predicted that higher temperatures are expected to raise sea level by expanding ocean water, melting mountain glaciers and small ice caps, and causing portions of Greenland and the Antarctic ice sheets to melt. Increasing temperatures tend to increase evaporation which leads to more precipitation. As average global temperatures have risen, average global precipitation has also increased. According to the IPCC⁵, there has been an increase in the number of severe precipitation events over many areas during the past century, as well as an increase since the 1970s in the prevalence of droughts, especially in the tropics and subtropics. More specifically, the IPCC Chapter 1 concludes that: “It is likely that the frequency of heavy precipitation will increase in the 21st century over many areas of the globe.” It further concludes that “(T)he risk of severe harm and loss due to climate change-related hazards and various vulnerabilities is particularly high in low-lying coastal zones.” Ibid.

Climate change will likely cause flooding in locations where no flooding has occurred before. For example, storm surge and wave inundation may occur in areas newly subject to sea level rise. In other circumstances, climate change will exacerbate flooding, erosion, landslides, and other natural hazards that are already occurring. As a contributing factor, it will also add to the areal extent, depth, and velocity of flooding.

Climate change will cause some inland areas of the U.S. such as the Southwest to become drier while other areas such as the Southeast will become wetter.⁶ Seasonal changes in precipitation are also expected such as increased winter rain and runoff in the mountains of the West and summer rain and runoff in the same areas. The frequency and intensity of hurricanes and coastal storms will likely also increase.

A study reported in the February 17, 2011 issue of *Nature*⁷ magazine found that heavy precipitation in recent years is due at least in part to the increase of manmade greenhouse gases

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- A similar panel of scientists in Rhode Island predicts a minimal 3 to 5 foot rise for that state.
 - A Washington State report assumes a sea level rise along the shores of Puget Sound of a bit more than 4 feet.
 - A report to the state of California assumes a 4 foot rise along the California coast.
 - The Dutch, who take sea level rise more seriously than anyone, assume for the purposes of design of dikes and storm gates that sea level will rise 2.5 feet by 2050.

See also IPCC, Summary for Policymakers, Section C. Current Knowledge About Future Impacts – Magnitudes of Impact in IPCC AR4 WG2 2007 provides that “ Partial deglaciation of the Greenland ice sheet, and possibly the West Antarctic ice sheet, could contribute 4 to 6 m (13 to 20 ft) or more to sea level rise.”

⁴See IPCC, Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation, Summary for Policy Makers. IPCC 2011. The report concluded that: “Based upon A1B and A2 emission scenarios, a 1-20 year hottest day is likely to become a 1-2 year event by the end of the 21st Century in most regions....”

⁵See <http://www.epa.gov/climatechange/science/recentpsc.html>.

⁶NOAA's National Climatic Data Center has compiled precipitation data which show that over the contiguous U.S., total annual precipitation have increased at an average rate of 6.1 percent per century since 1900, although there was considerable regional variability. The greatest increases came in the East North Central climate region (11.6 percent per century) and the South (11.1 percent). Hawaii was the only region to show a decrease (-9.25 percent).

⁷See Min, S.K et Al. *Nature* 470, 378-381 (2011).

in the atmosphere. In this study, a team of scientists from Scotland and Canada used computers to analyze the causes behind the rise in storms and heavy snowfall over the past fifty years. They found that the likelihood of extreme precipitation on any given day rose by 7% between 1951 and 1999—the years addressed by the study. This increase exceeds the bounds of normal variability. This increase is explained if greenhouse gas emissions and climate change are taken into account. Climatologists have predicted an increase in extreme weather events as greenhouse gas concentrations in the atmosphere increase. Warmer air can carry more water vapor and a warmer planet should therefore see heavier rain and other precipitation. Another article in *Nature* suggests that for every 1 C in warming, scientists expect a 2-3% increase in total global precipitation.⁸

In the same issue of *Nature* the results of a study of the severe rains that flooded England and Wales in 2000 was published.⁹ Researchers looked at the climate as it existed in 2000 in comparison with hypothetical climates as they would have existed if human beings had not added greenhouse gases into the atmosphere. The article concluded that the chances of a major flood happening at that time were roughly doubled by the rise in greenhouse gases.

The U.S. Supreme Court held, in a landmark case, *Massachusetts v. EPA*,¹⁰ that EPA had the statutory authority and responsibility to regulate greenhouse gases which are causing or contributing to climate change. The Court recognized in a factually-specific decision the following harms associated with climate change¹¹:

The harms associated with climate change are serious and well recognized. Indeed, the NRC Report itself — which EPA regards as an "objective and independent assessment of the relevant science," 68 Fed. Reg. 52930 — identifies a number of environmental changes that have already inflicted significant harms, including "the global retreat of mountain glaciers, reduction in snow-cover extent, the earlier spring melting of ice on rivers and lakes, [and] the accelerated rate of rise of sea levels during the 20th century relative to the past few thousand years. . . ." NRC Report 16.

Petitioners allege that this only hints at the environmental damage yet to come. According to the climate scientist Michael MacCracken, "qualified scientific experts involved in climate change research" have reached a "strong consensus" that global warming threatens (among other things) a precipitate rise in sea levels by the end of the century, MacCracken Decl. ¶ 5, Stdg. App. 207, "severe and irreversible changes to natural ecosystems," *id.*, ¶ 5(d), at 209, a "significant reduction in water storage in winter snowpack in mountainous regions with direct and important economic consequences," *ibid.*, and an increase in the spread of disease, *id.*, ¶ 28, at 218-219. He also observes that rising ocean temperatures may contribute to the ferocity of hurricanes. *Id.*, ¶¶ 23-25, at 216-217.[fn18]

⁸Allen, R. et.al. *Nature*, 470 , 344-345 (2011).

⁹Pall, P. et. al *Nature*, 470, 382-385 (2011).

¹⁰549 U.S. 497 (S. Ct., 2007).

¹¹549 U.S. 497, 521 (S. Ct., 2007).

With increased hazards, and continued and intensified occupation of floodplains will come additional flooding and flood damages to private and public property. This will likely result in law suits based upon a variety of legal theories discussed below. To reduce climate-related flood hazards it is also likely that an increasing number of states and local governments will adopt or revise their floodplain regulations to reflect climate change such as revised flood maps, regulatory flood elevations, and freeboard requirements, as well as increased floodways and velocity zones. However, some floodplain and wetland landowners will likely challenge regulations as a taking of private property without payment of just compensation.

Government Inaction

Despite the prospect of worsening flooding and erosion problems due to climate change, only a small portion of the governmental units in the United States are, apparently, reflecting climate change in their policies and activities. For example, few are revising their flood inundation maps or establishing new flood protection elevations. Such omissions could result in increased flooding and flood damages due to the inadequate flood proofing elevations, inadequate design, construction, and maintenance of flood control structures (e.g., dikes, dams, levees, groins, sea walls); inadequate design and construction of highways (e.g., bridge apertures and culverts); inadequate management of public lands (e.g., flash flooding where campers may be using public lands); and in a variety of other contexts. The likelihood of successful suits increases as the scientific support for human-induced climate change and resulting flood losses increases and the climate-related risks are quantified. See discussion below.

Apart from climate change-related flooding and erosion, courts are increasingly holding governments liable for flood damages caused by more traditional flooding under common law (e.g., nuisance, negligence) theories and, to a lesser extent, under Constitutional legal theories (e.g., “inverse condemnation”). These suits will likely continue but with the addition of climate change as one causative or contributing factor to the increased flooding and erosion. Over time, climate change will likely become an increasingly important risk factor.

Taking climate change into account in establishing flood loss protection standards will require partially changed flood assessment methods. Floodplain regulatory and management agencies have, to a considerable extent, based their flood calculations on historic flood and rainfall data. Taking climate change into account will require new assumptions and more reliance on model projections than historical records. Because flood hazard management agencies have difficulty in accurately predicting the magnitude and location of climate changes does not mean that they cannot predict “probabilities” and “ranges” of likely increases. And, there may be a variety of “low risk” options for simultaneously addressing climate change and achieving other objectives such as providing urban greenways and recreation areas as well as reducing flood losses in a particular circumstance.

Government liability for failing to take into account flood damages may be based upon the common law tort theories briefly discussed below such as negligence (i.e. “unreasonable conduct”), public and private nuisance, strict liability, trespass, negligence, denial of lateral support, and violation of riparian rights. Such suits may also be based, in some circumstances, upon claims of government taking of private property without payment of just compensation.

Measures which governmental units could take to reduce potential liability for flood and erosion damages caused or exacerbated by climate change are discussed in the summary and recommendations above, concluding remarks, and Box 1 below. These measures will also reduce more traditional flood and erosion-related flood damages and flood-related litigation.

Contexts in Which Individuals Damaged By Flooding May Sue Governments if Governments Fail to Consider Climate Change in Their Programs and Policies

Floods continue to cause severe damages in the U.S. and abroad despite efforts to reduce such losses through flood control works, adoption of regulations, and other measures. A comparatively small flood in Colorado in 2013 caused more than 3 billion dollars in damages. The "Great Flood" along the Mississippi in 1993 and its tributaries caused damages estimated at 15-20 billion dollars.¹² Hurricane Katrina in 2005 killed more than 900¹³ and caused damages which have been estimated to approach \$200 billion dollars.¹⁴ According to NOAA losses from Super Storm Sandy in 2012 cost 67 billion dollars making it the 2nd costliest storm in US history. When flood plain landowners are damaged by flooding or erosion they quite often sue governments in more traditional flooding or erosion contexts based upon common law or Constitutional legal theories claiming that the governments increased flooding and flood damages to their properties. Landowners may also question the reasonableness and adequacy of the design, operation, and maintenance of dikes, dams, levees, drainage channels, and culverts and other flood loss reduction measures.

Successful common law (tort) liability suits based upon traditional flooding and erosion have become increasingly expensive to governments. For example, in 2003 the California Court of Appeals upheld a damage award against the State of California for flood damages. See *Paterno vs. State of California*.¹⁵ The settlement total in this suit was \$464 million dollars. Much larger amounts of money are at stake in the law suits filed by private landowners and local governments in Louisiana and the neighboring states of Florida, Alabama, and Mississippi after Hurricane Katrina struck the Gulf on August 29, 2005. Suits had been filed on behalf of approximately 250,000 people seeking over \$278 billion in damages from the federal government alone.¹⁶

¹²See <http://mo.water.usgs.gov/Reports/1993-Flood/>

¹³See http://www.msnbc.msn.com/id/11281267/ns/us_news-katrina_the_long_road_back

¹⁴See <http://pubs.usgs.gov/fs/2006/3026/2006-3026.pdf>

¹⁵113 Cal.App.4th 998 (Calif., 2003).

¹⁶See generally, Houck, O. "The Three Katrinas: Hard Cases Make New Law, National Wetland Newsletter, July-August, 2010; Brougher, C & K. Alexander, CRS Report to Congress, Federal Liability for Hurricane Katrina-Related Flood Damage, Congressional Research Service, Washington, D.C. (2008); Thomas, E., 2007, Recovery Following Hurricane Katrina: Will Litigation and Uncertainty Today Make for an Improved Tomorrow? Vol 29, no. 5, National Wetlands Newsletter, Environmental Law Institute, Washington, D.C.; Brougher, C., Flood Damage Related to Army Corps of Engineers Projects: Selected Legal Issues, Congressional Research Service (June 7, 2011). In *Re Katrina Canal Breaches Consolidated Litigation*, 05-4182 Section C.A.No.05-4182.

Courts have already held governments liable in many situations under common law and Constitutional legal theories (e.g., “taking without payment of just compensation”) for causing or exacerbating flood or drainage problems. These suits will likely continue but with the addition, over time, of climate change as one causative factor for flooding and erosion losses.

Some more specific contexts in which landowners damaged by climate change-related flooding or erosion may sue governments for such flood damages include:

--Increased flood and erosion damages resulting from government issuance of building permits for development in coastal and inland climate-related flood areas. Landowners may sue governments for issuing permits (building codes, zoning, subdivision controls) which fail to consider increased flood hazards due to climate change.

For examples of cases holding governments liable for issuing building permits or other permits which increased flood damages on their properties in more traditional flooding contexts see, e.g., *Hurst v. U.S.*,¹⁷ in which a federal district court held the Corps of Engineers liable for issuing a Section 404 permit for construction of jetties in the White River. The jetties were not constructed as called for in the permit and blocked flows in the river. As a result, a landowner was seriously flooded. The Corps knew that Hurst was violating the permit issued to him and the Corps violated its own regulations by failing to issue an order prohibiting any further work by Hurst on the project despite many requests by the landowner who was damaged. The district court initially held that the landowner could not sue the Corps pursuant to the Federal Tort Claims Act. On appeal the Eighth Circuit reversed the dismissal and remanded the case for findings on the claim that the Corps caused Hurst’s damages by negligently failing to issue a prohibitory order. See *Hurst v. United States*.¹⁸ On remand to the district court, the court of appeals observed that “the Corps’ regulations governing issuance of permits for projects in navigable waterways also indicates that the Corps should be concerned with minimizing the risks of flooding on surrounding property.”¹⁹ The court found that²⁰:

Because the Hursts were included in the class of persons meant to be offered some protection from flooding under the federal regulations governing the Corps, the Corps’ failure to enforce its own regulations amounts to negligence per se under South Dakota law.

For other cases holding governmental units liable for issuing permits or approving subdivisions which increase flooding on other property see, for example, the following: *Eschete v. City of New Orleans*²¹ (City could be held liable for approving subdivision which overtaxed drainage system and caused flooding.); *City of Keller v. Wilson*²² (City was liable for approving subdivisions based upon city’s drainage plan but then failing to acquire 2.8 acres to implement

¹⁷739 F. Supp. 1377 (D., 1990).

¹⁸882 F.2d 306 (8th Cir., 1989).

¹⁹*Id.* at 1380.

²⁰*Id.* at 1381, 1382.

²¹245 So.2d 383 (La., 1971).

²²86 S.W.3d 693 (Tex., 2002).

the plan. This case was partially reversed and remanded by *City of Keller v. Wilson*²³; *Harris Cty. F. Con. V. Adam*,²⁴ (Harris County Flood Control District was potentially liable for approval of a highway project (Beltway 8) which flooded private property.); *Kite v. City of Westworth Village*²⁵ (A “taking” without payment of just compensation potentially occurred where city approved a plat resulting in a diversion of water from its natural course and resulting damage.); *Pennebaker v. Parish of Jefferson*²⁶, (Parish could be held liable for increased flooding by allowing street improvements, building construction and street drainage without taking steps to prevent flooding.); *Sheffet v. County of Los Angeles*,²⁷ (County was liable when it approved subdivision and accepted dedication of road facilities which resulted in flood and erosion damages.); *Frustuck v. City of Fairfax*,²⁸ (City was liable in inverse condemnation for having approved subdivisions and accepted drainage easements and having diverted increased waters onto private property.); *Yue v. City of Auburn*,²⁹ (City was potentially liable for approving subdivision which increased impervious surfaces without upgrading downstream stormwater facilities to convey increased flows.).

--Deaths and injuries due to flash flooding on public lands. Flash floods will likely occur more frequently in some areas of the U.S. as the intensity and perhaps the frequency of thunderstorms, hurricanes, and coastal storms increases. Members of the public may be injured or killed while utilizing public lands³⁰ for hiking, camping, and other recreation. They may sue public land managers for failing to provide adequate flood warnings and for failing to develop adequate hazard mitigation plans. Governments may be liable, like other landowners, in situations where the public or private employees are injured by natural hazards while using public lands such as public forests, parks, wilderness areas, recreation areas, lakes, streams, ocean waters, beaches, reservoirs, wetlands, and other waters or water-related lands. Governments may also be liable for natural hazard injuries to the public or government employees in public buildings such as post offices, museums, schools, courthouses, libraries, campgrounds, marinas, publicly owned housing, industrial parks, or other publicly owned or leased properties. In addition, governments may be liable to others for renting, leasing or selling lands subject to natural hazards. Liability for failing to anticipate flash flooding to date has been based primarily upon the theory of negligence.

For examples of cases holding the federal government liable for flood-related deaths from flash flooding on public lands see, e.g., *Coates v. United States*.³¹ In this case three campers were killed at Aspenglen Campground in Rocky Mountain National Park when Lawn Lake dam burst on July 15, 1982. The National Park Service attempted to warn campers of the impending flood.

²³168 S.W.3d 802 (Tex., 2005); *City Keller v. Wilson*, 2-00-183-CV (Tex., App. 2007).

²⁴56 S.W.3d 665 (Tex., 2001).

²⁵853 S.W.2d 200 (Tex., 1993).

²⁶383 So.2d 484 (La., 1980).

²⁷84 Cal. Rptr. 11 (Cal., 1970).

²⁸28 Cal. Rptr. 357 (Cal., 1963).

²⁹4 Cal. Rptr.2d 653 (Cal., 1992).

³⁰Private landowners lands may also be subject to suit if they open their lands to the public, particularly if they charge a fee for such use.

³¹612 F. Supp. 592, 596 (D. Ill, 1985).

But, the three failed to respond and were killed by the rapidly rising waters. The heirs of the three sued the National Park Service claiming inadequate warnings and negligence. A federal district court held the National Park Service liable for not providing adequate warnings. The court also held that the Service had failed to develop an adequate plan for warning and evacuating people in the Park “in the event a crisis arose.” See also *Ducey v. United States*,³² (Park Service possibly liable for failing to warn of or guard against flash flooding.).

--Permanent flood and erosion damages caused by coastal sea level rise. Rising sea levels combined with increased hurricanes and coastal storms will likely increase the depth and velocity of flooding on a more or less permanent basis in some contexts and the severity of flooding and erosion in other contexts with resulting increased damage to coastal structures and infrastructure. Landowners could sue governments arguing that governments have acted unreasonably in issuing permits and for failing to address climate change in the design of groins and seawalls and other coastal flood protection measures. Growing scientific agreement concerning the magnitude of sea level rise due to climate change and identification of areas which will be inundated will help provide the factual basis for such suits. Several organizations such as the U.S. Geological Survey in cooperation with NOAA and other state and federal agencies are now preparing such maps.

In addition to these contexts in which landowners may sue communities and states for increasing flood and/or erosion damages, landowners may also challenge tightened floodplain regulations as an unconstitutional “taking” of private property without payment of just compensation. See discussion below. Strengthened hazard regulations may take the form of zoning regulations, subdivision controls, building codes, sanitary codes, and other special codes adopted at state, or (primarily) local levels. See discussion below pertaining to the Constitutionality of floodplain regulations reflecting climate change and related flood and erosion issues.

LITIGATION THEORIES

Landowners may sue governments for failing to consider climate change in their programs and policies pursuant to a number of statutes offering nonmonetary remedies such as the Endangered Species Act (see Appendix B). Private landowners damaged by flooding may also file law suits for damages claiming that governments have increased climate-related flooding and flood damages based upon a number of other legal theories including but not limited to those described below.³³ This list is not exhaustive. For example, there is no discussion of “fraud” because fraud is discussed at some length in a law review article by Jennifer Klein, “Potential Liability of Governments for Failure to Prepare for Climate Change”, Columbia Law School (2013). For more information the reader is referred to this article.

³²713 F.2d 504 (9th Cir., 1983).

³³See, also, Justin R. Pidot, *Global Warming in the Courts: An Overview of Current Litigation and Common Legal Issues*, *Geo. Envtl. L. & Pol’y Inst.* 16 (2006), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1695720

“Private” and “Public” Nuisances

In some circumstances, governments may be sued based upon common law nuisance if they increase flood or erosion hazards on other lands by activities on their own lands. Nuisances may be either ‘private’ or ‘public’. With either type, at common law, no landowner has a right to use his or her land in a manner that substantially interferes, in a physical sense, with the use and enjoyment of other lands. See, e.g., *Sandifer Motor, Inc. v. City of Rodland Park*³⁴ (Flooding due to city dumping debris into ravine which blocked sewer system was a nuisance.) Public or private nuisance pertains to interference with right to use of land and is therefore more restricted than “negligence”. It is the unreasonable, unwarranted, or unlawful use of one's property in a manner that substantially interferes with the enjoyment or use of another individual's property, without an actual trespass or physical invasion of the land. "Reasonable" conduct is usually no defense against a nuisance suit although reasonableness may affect the type of relief available. For a discussion of the federal common law of nuisance as applied to climate change see *Connecticut v. American Electric Power Company, Inc.*,³⁵ above.

Examples of government activities which may increase natural hazards in climate change contexts and may be subject to public or private nuisance suits include but are not limited to the construction, operation, and maintenance of channelization works, dikes, dams, levees, culverts, bridges, highways, groins, and sea walls.

“Public” Nuisances

One category of nuisance cases involve claims by a variety of parties that government polluters have made meaningful contributions to atmospheric gases and the resulting changes in climate constitute a “ public” nuisance³⁶ under state and/or federal common law. A public nuisance represents an "unreasonable" interference with a public right, and “an active - or, at least, an imminent threat of injury”.³⁷ Public nuisance is a broad and amorphous legal theory. Courts to date have provided some dicta support for climate-related public nuisance suits although there have been no successful judgments. See for example, *Comer v. Murphy Oil, USA*³⁸ (5th Cir., 2009) in which the plaintiffs alleged that Comer and other defendants producing fossil fuels released greenhouse gases that contributed to climate change which, in turn, added to the ferocity of Hurricane Katrina causing damages to plaintiff's property. The suit was brought under the legal theories of public and private nuisance, trespass, negligence, unjust enrichment, fraudulent misrepresentation, and civil conspiracy. This suit survived preliminary legal challenges but was

³⁴628 P.2d 239 (Kan., 1981).

³⁵82 F.3d 309 (2d Cir., 2009). This decision was overturned in 131 S. Ct. 2527 (S.Ct., 2011). Nevertheless, the case is included here because it contains a useful discussion of nuisance law.

³⁶A public nuisance interferes with the public as a class, not merely one person or a group of citizens. Abate, Randall S., *Public Nuisance Suits for the Climate Justice Movement: The Right Thing and the Right Time*, 85(2) *Wash. L. Rev.* 197 (2010); Alex, Ken, *A Period of Consequences: Global Warming as Public Nuisance*, 26 *A Stan. Envtl. L. J.* 77 (2007).

³⁷See generally, *New England Legal Found. v. Costle*, 666 F.2d 30, 33 (2d Cir., 1981).

³⁸585 F.3d 855 (5th Cir. 2009).

dismissed because one of the judges “recused” himself (disqualify or remove oneself as a judge over a particular proceeding) and the court, therefore, lacked a quorum.

Courts in other climate-related cases have rejected public nuisance arguments. For example, a federal district court in *Native Village of Kivalina v. Exxon Mobil Corporation*³⁹ dismissed a public nuisance law suit by the native village of Kivalina against utility, oil, and energy companies claiming that Exxon’s emissions contributed to global warming which caused melting of Arctic sea ice which, in turn, flooded the native village. In *Connecticut v. American Electric Power Company, Inc.*,⁴⁰ eight states, the City of New York and a number of private land trusts sued as a public nuisance utility companies for causing global warming and a variety of damages. The 2nd Circuit court of appeals held that the state and land trusts had “standing” to sue. The court held that the plaintiffs could bring suit under a claim of “the federal common law of nuisance.” It also held that the case could not be dismissed on the ground of a political question doctrine. The court⁴¹ held that four of TVA’s plants constituted a public nuisance and ordered TVA to install or retrofit “scrubbers” at the four plants. This decision was appealed to the U.S. Supreme Court in *Connecticut v. American Electric Power Company, Inc.*⁴² The Supreme Court reversed the lower court and held that plaintiffs could not sue polluters under the federal common law of nuisance because Congress had adopted the Clean Air Act which preempted federal common law. The Court held that EPA’s actions pursuant to the Act displace any common law right to seek abatement of carbon dioxide emissions from fossil-fuel powered power plants. However, the court did not decide whether the federal Clean Air Act preempted state suits pursuant to state common law theories of nuisance, trespass, or other legal theories. Courts are reluctant “to enjoin as a public nuisance activities which have been considered and specifically authorized by the government.”⁴³

“Private” Nuisances

Private nuisances are conceptually and legally similar to public nuisances except that private nuisances involve private parties as defendants or as both plaintiffs and defendants. Such suits differ in a number of other ways from “public nuisance” suits of the sort described above and have greater likelihood of surviving legal challenges for several reasons. First, there is broad precedent for successful private common law nuisance suits in flooding contexts in which private landowners claim that governmental units have created a nuisance by failing to adequately consider more traditional flood hazards in their activities and this has increased flood damages. Second, private nuisance suits between governments and private landowners based upon negligence or other common law theories are typically less nebulous than suits based upon “public nuisance” discussed above and less susceptible to arguments that broad issues of public policy are involved and these issues should be addressed in a legislative forum. Third, in most

³⁹663 F.Supp.2d 863 (D., Cal. 2009).

⁴⁰582 F.3d 309 (2d Cir., 2009).

⁴¹Id.

⁴²131 S. Ct. 2527 (S.Ct., 2011).

⁴³See, e.g., *State of North Carolina v. Tennessee Valley Authority*, 615 F.3d 291, 309 (4th Cir., 2010).

instances, failure to consider climate change will be only one additive factor in a flood or erosion damage suit based upon state common law pertaining to flooding.

Negligence (“Unreasonable” Conduct)

Governments and, more broadly, both public and private landowners have long had a duty to exercise "reasonable care" in their actions in order to avoid injury to others. See generally *The Law of Torts*, 5th ed. (1984) at p. 169.⁴⁴ Unlike nuisance and trespass which involve damages to land, negligence is broader and applies to many types of activities including but not limited to damages to land.

Negligence results from the creation of an unreasonable risk of injury to others. In determining whether a risk is unreasonable, both the seriousness and likelihood of the harm are relevant. The standard of conduct is that of a "reasonable man" in the circumstances. In a negligence-based flood liability suit, landowners need to show that governments have a duty to undertake or avoid actions which increase flood damages; that increased flooding has occurred; that they have been damaged; and that the damages have been caused by government action or inaction.

Negligence provides a broad basis for flood-related suits, potentially including climate-related suits. It has become the primary legal theory upon which public liability for traditional flood hazards has rested for inadequate construction and maintenance of hazard reduction measures such as flood control structures, improperly prepared and issued warnings, inadequate processing of permits, and inadequate inspections.

There have apparently been no successful negligence suits to date based upon the arguments that governments are liable for damages for failing to take into account climate change in their flood programs with resulting increases in flood damages beyond those naturally occurring. However, successful suits seem quite possible in the future for the reasons set forth below.

A variety of factors are relevant to the "reasonableness" of government conduct in a specific circumstance. Some of these include:

--The severity of the potential harm posed by a particular activity. Where severe harm may result from an act or activity, a "reasonable man" must exercise great care. See *Blueflame Gas, Inc. v. Van Hoose*⁴⁵, in which the court stated “(t)hat the greater the risk, the greater the amount of care required to avoid injury to others.” With an ultrahazardous activity, the degree of care required may be so great that it approaches strict liability. For example, flash flooding due to climate change will pose severe harm in some circumstances such as the failure of a dam or overtopping of a levee.

⁴⁴See generally *The Law of Torts*, 5th ed. (1984) at p. 169.

⁴⁵679 P.2d 579, 587 (Col., 1984).

--**Knowledge of the danger.** A reasonable man is responsible for injuries or damages which he or she knows or should know. See, e.g., *Whitaker v. Bossier City*⁴⁶ (City not liable for small hole in area subject to city easement because city had no actual or constructive notice of hole.). Courts often find negligence where a landowner is aware of a dangerous condition. It is hard to imagine public employees or consultants working with flood-related programs with no knowledge of climate change although they may not have highly specific knowledge with regard to the severity of climate-related flooding at specific sites.

--**Foreseeability of the harm.** A "reasonable man" is responsible for injuries or damages which are or could be reasonably foreseen. See *Scully v. Middleton*.⁴⁷ To constitute negligence, the act must be one which a reasonably careful person would foresee posing an appreciable risk of harm to others. The test is not only whether he or she did in fact foresee the harm but whether he or she should have foreseen it, given all the circumstances. For example, the direct warning of a dangerous condition such as the cell phone report from a driver on a public road that a bridge has been washed out provides foreseeability with regard to the need for placement of barricades. But, so may a flood map or other sources of information.

The foreseeability of natural hazards has been dramatically increased in the last two decades not only by documentation of past events but through development of various prediction models for floods, earthquakes, volcanoes, hurricanes, and virtually all other hazards. Courts do not require that events be specifically predictable (e.g., date, place) to be "foreseeable". It is enough that the event could have been anticipated in a more general sense. For example, in *Barr v. Game, Fish and Parks*,⁴⁸ the Colorado Court of Appeals rejected an "act of God" defense for flooding, erosion and silt deposition damage caused by construction of a dam with an inadequate spillway by the Colorado Game, Fish and Parks Commission. The court held that a "maximum probable storm, by definition, is both maximum and probable". The Court of Appeals agreed (*Id.*, at 344) with the lower court which had concluded:

(W)ith modern meteorological techniques, a maximum probable storm is predictable and maximum probable flood is foreseeable. Thus being both predictable and foreseeable to the defendant in the design and construction of the dam, the defense of act of God is not available to them. In short, the flood which occurred in June of 1965 could not be classified as an act of God.

The court concluded that the dam should have been designed to meet the requirements of the maximum probable flood—about 200,000 cubic feet per second at this point of the stream.

Trespass

At common law, landowners may also bring trespass actions for certain types of public and private physical invasions of private property such as flooding or drainage. See e.g., *Hadfield v. Oakland County Drain Com'r.*⁴⁹ There are several different types of "trespass". However, a

⁴⁶813 So.2d 1269 (La., 2002).

⁴⁷751 S.W.2d 5 (Ark., 1988).

⁴⁸497 P.2d 340 (Col., 1972).

⁴⁹422 N.W.2d 205 (Mich., 1988).

discussion of the law of trespass is beyond the scope of this paper. Principal activities which may be subject to trespass suits in climate-related contexts are similar to those which may be subject to “nuisance suits. See above.

Violation of Riparian Rights

At common law, riparian landowners enjoy a variety of special rights incidental to the ownership of riparian lands. These rights or "privileges" include fishing, swimming, and construction of piers. Riparian rights must be exercised "reasonably" in relationship to the reciprocal riparian rights of other riparian landowners. Courts have held that construction of levees, dams, etc. by one government or private riparian landowner which increases flood damages on other riparian lands are a violation of riparian rights.⁵⁰ Failure to reasonably take into account increases in flooding due to climate change may also, arguably, constitute a violation of riparian rights.

The Law of Surface Waters

Under the rule of "reasonable use" (or some variation of it) for “surface” waters adopted by courts in most states, landowners may not, at common law, block the flow of diffused surface waters, substantially increase that flow, or channel that flow to a point other than the point of natural discharge. Courts have usually applied the rule of reasonable use to governmental units as well as private landowners. But there are some differences. For example, a Minnesota court held that a community could not claim “reasonable use” as a defense to a “taking claim”.⁵¹

Strict Liability

Courts, in most states, have held that landowners and governments are "strictly liable" for the collapse of dams or levees because impoundment of water, following an early English ruling, has often been considered an "ultra-hazardous" activity and subject to “strict” liability. Private and public landowners are liable for damages from ultra-hazardous activities even when no negligence is involved. Landowners damaged by climate change-related flooding and erosion from the collapse of a dam or levee could argue that rules of strict liability apply to such damages or, at a minimum, that failure to adequately anticipate such flooding is negligence.

Denial of Lateral Support

At common law, the owner of land has a duty to provide "lateral support" to adjacent lands and any digging, trenching, grading, or other activity which removes naturally occurring lateral support must be done at one's peril. Erosion caused by climate change in the construction or maintenance of roads, bridges, buildings, and other public works may deny lateral support to adjacent lands causing land failures (landslides, mudslides, erosion, and building collapse).⁵²

⁵⁰See *Lawden v. Bosler*, 163 P.2d 957 (Okla., 1945).

⁵¹See *Wilson v. Ramacher*, 352 N.W.2d 389 (Minn., 1984).

⁵²See, e.g., *Blake Construction Co. v. United States*, 585 F.2d 998 (Ct. Cl., 1978) (U.S. government liable for subsidence due to excavation next to existing buildings.)

Statutory Liability

Some states have adopted statutes which create separate statutory grounds for flood and erosion-related law suits. For example, the Texas Water Code, article 7589a (Act of 1927) makes it unlawful for any person to divert the natural flow of waters or to impound surface waters in a manner that damages the property of others.⁵³ These statutes could, at least in part, form the basis for law suits claiming that governments have exacerbated or failed to anticipate climate-related flood damages.

Inverse Condemnation ("Taking" Without Payment of Just Compensation) Due to Flooding of Private Lands

Landowners are not limited to common law legal theories in suing governments for increasing flooding and erosion on their private lands. Courts increasingly hold governments liable for direct physical interference with private lands due to flooding, mudflows, landslides, or other physical interferences based upon a theory of "taking" of property without payment of just compensation. See discussion below. For example, see *Ingram v. City of Redondo Beach*⁵⁴, in which the court held that collapse of an earthen retaining wall maintained by the city with resulting flooding was basis for an inverse condemnation suit. Inverse condemnation actions for damage or destruction of private property due to increased natural hazards caused by government activities have been recognized in many states.⁵⁵

CLIMATE CHANGE AND UNCOMPENSATED "TAKING" OF PRIVATE PROPERTY

As discussed earlier, landowners in climate-related suits may not only sue governments for increasing flooding and flood damages to their private property based upon various common law legal theories but in some instances for tightly regulating private property without payment of just compensation. The 5th and 14th amendments to the U.S. Constitution and similar provisions in state constitutions require that governments pay "just compensation" if they "take" private property. Landowners may claim a taking in both regulatory and nonregulatory contexts. We will briefly consider both contexts.

Increased Flooding and Erosion Damages as a Taking of Private Property in Non Regulatory Contexts

As discussed above, governments may "take" private property by increasing flood or erosion hazards and damages in a broad range of flood-related non regulatory contexts such as fill and grading, construction of bridges, installation of culverts, construction of dams and levees, and

⁵³See, e.g., *Miller v. Letzerich*, 49 S.W.2d 404 (Tex., 1932).

⁵⁴119 Cal. Rptr. 688 (Cal., 1975).

⁵⁵See, e.g., *Wilson v. Ramacher*, 352 N.W.2d 389 (Minn., 1984) (flooding); *McClure v. Town of Mesilla*, 601 P.2d 80 (N.M., 1979) (operation of drain pipe).

construction of sea walls, groins and jetties. Increased flooding, erosion, mudslides, and landslides may be expected with an increase in precipitation and the intensity and magnitude of storms in some areas such as the Northeast and Southeast. As a result, what are now considered once in 100 year storms will occur more frequently and the flood depths and velocities of floods which do occur may exceed the design capacity of levees, dams, and stormwater systems. Winter flooding may also be increased in the northern states as more winter precipitation occurs as rain rather than snow. Landowners may argue that governments have acted unreasonably if governments have failed to consider changed conditions in designing, constructing, maintaining and operating flood control structures, issuing permits, or constructing or operating flood warning systems.

Courts, with very limited exceptions, find a taking if private property is physically appropriated, damaged, destroyed or otherwise physically used for public purposes. See, e.g., *Loretto v. Teleprompter Manhattan CATV Corp.*⁵⁶ An example of a physical taking in a flood context is government construction of a dune on private property. See, for example, *Lorio v. Sea Isle City*⁵⁷. However physical “taking” without compensation is rare because regulatory agencies usually make no attempt to actually possess private lands. Where they do, landowners with flooding increased by government actions have the option of suing governments under Constitutional “taking” or tort theories.

See *St. Bernard Parish v. United States*, 696 F.3d 436 (5th Cir. 2012) cert denied sub nom; *In Re Katrina Canal Breaches Litigation*, No. 05-1119 L. May 1, 2015. In this case, the federal Court of Claims held⁵⁸ the United States liable for flood damages from Hurricane Katrina caused by the “gross negligence” of the Army Corps of Engineers in failing to adequately operate and maintain the Mississippi River Gulf Outlet—a canal built to permit swift passage between the Port of New Orleans and the Gulf of Mexico. The Court of Claims awarded five plaintiffs \$720,000 in damages with a likely much larger ultimate payout to other plaintiffs. This suit may open the door to many other suits claiming that governments “take” private property by failing to adequately maintain infrastructure such as dams, dikes and levees.

Highly Restrictive Regulations as a Taking of Private Property in Regulatory Contexts

As discussed above, landowners subject to climate change-related floodplain regulations may also sue governments for tightly regulating their lands. Landowners have succeeded in only a few suits challenging the Constitutionality of flood plain regulations (none related to climate change) and future challenges to climate-related floodplain regulations on taking grounds are similarly likely to fail but governmental units need to be careful, particularly where regulations prevent all economic use of lands. Over the last several decades, courts have broadly upheld flood and erosion regulations based upon more traditional flooding and erosion against taking

⁵⁶458 U.S. 419 (S., Ct., 1982).

⁵⁷212 A.2d 802 (N.J., 1965).

⁵⁸See *In Re Katrina Canal Breaches Litigation*, 673 F.3d 381 (5th Cir. 2012). See also Brougher, C., *Flood Damage Related to Army Corps of Engineers Projects: Selected Legal Issues*, Congressional Research Service (June 7, 2011). <https://takingslitigation.files.wordpress.com/2015/05/05-1119-opinion-and-order-on-liability.pdf>

claims. It is likely they will likewise support amended regulations which incorporate climate change.

For examples of cases supporting restrictive regulations for traditional flood or erosion areas see, e.g., *Gove v. Zoning Board of Appeals of Chatam*⁵⁹ (Court held that zoning board's denial of a residential building permit for a parcel of land located within a coastal conservancy and flood district subject to severe coastal flooding was not a taking because it did not deny the landowner all economically beneficial use of land and did not deprive her of distinct investment backed expectations.); *McQueen v. South Carolina Coastal Council*⁶⁰ (Court held that denial of permits to backfill two lots and build bulkheads for an area considered "tidelands" was not a taking because they were public trust property and subject to control by the state.); *Spiegle v. Beach Haven*⁶¹ (Court upheld, against challenge, building setbacks and fence ordinances for a coastal area which had been badly damaged by the Ash Wednesday storm of March 1962 against claims that the regulations were a taking of private property.); *McCarthy v. City of Manhattan Beach*,⁶² (Court upheld a beach zoning district which limited the beach to open space recreational uses based, in part, upon potential for storm damage to structures if constructed in the beach area.); *Town of Indialantic v. McNulty*⁶³ (Court upheld setback line in part, to prevent future flood and erosion damage from hurricanes.)

In deciding whether floodplain and other types of regulations are a regulatory taking, courts apply four overall tests:

--First, they determine whether regulations physically appropriate private property. As discussed above, courts typically hold that any physical appropriation is a taking. This is rarely an issue with floodplain regulations because regulations do not physically appropriate property.

--Second, courts determine whether the regulations deny all "economic use" of lands. "Denial of all economic use" is a common "bottom line" test for regulations. Landowners may file a suit if regulations prevent **all economic** use of entire private properties and the proposed activities lack nuisance or public safety considerations. See, e.g., *Monsoldo v. State*⁶⁴ (New Jersey Supreme Court held that state floodway restrictions could be a taking of private property if regulations deny all economic or productive use.). See also *Lucas v. South Carolina Coastal Council* (possible taking).⁶⁵

In deciding whether regulations deny all economic use of lands a court looks at the entire property not simply a portion. This means that floodplain setbacks, dune lines, floodway areas and other regulations tightly controlling only portions of properties are not held to be a taking if economic uses remain for other portions. Courts also do not hold regulations to be a taking

⁵⁹831 N.E.2d 865 (Mass., 2005).

⁶⁰580 S.E.2d 116 (S.C., 2003).

⁶¹218 A.2d 129 (N.J., 1966).

⁶²264 P.2d 932 (Cal., 1953).

⁶³400 So. 2d 1227 (Fla., 1981).

⁶⁴898 A.2d 1018 (N.J., 2006).

⁶⁵505 U.S. 1003, 1015 (S.Ct., 1992).

where the regulated area is owned by the state or is subject to “public trust” or subject to public prescriptive easements. Courts do not hold regulations to be a taking if they prevent activities which would not be permitted under state rules of nuisance and property. For example, a regulation preventing development in coastal flood areas subject to sea level rise where such development would increase flood heights on other lands would merely prohibit what would be prohibited pursuant to state nuisance or trespass law. State common law and Constitutional theories which may apply in such contexts are described above.

--Third, courts determine whether public interests outweigh private interests. If there is no physical taking and there is no denial of all economic use, courts apply a third “Penn Central” balancing test to determine whether a taking has occurred.⁶⁶ This test balances public and private interests. The results in a specific circumstance depend upon a number of factors. Principle factors include “(t)he economic impact of the regulation on the claimant and particularly, the extent to which the regulation has interfered with distinct investment-backed expectations...” and the “character of the governmental action”.⁶⁷ As the Federal Court of Claims in *Norman v. U.S.*⁶⁸ observed in applying this test: “The court must balance the liberty interest of the private property owner against the government’s need to protect the public interest through the imposition of the restraint.”

As far as the author could determine, no court has held that hazard regulations are a taking when applying the Penn Central balancing of public and private interests test. Similar judicial support for regulations adopted to prevent or reduce flood damages from climate change is likely. Courts have broadly upheld restrictive floodplain regulations against Constitutional challenges to date, as discussed below, and a similar result is likely for regulations reflecting climate change.

Courts have traditionally given great weight to public health and safety considerations in sustaining regulations against Constitutional taking challenges. See, e.g., *Queenside Hills Realty Co., v. Saxl*,⁶⁹ in which the Court stated where public safety is involved, the legislature may take the most “conservative course which science and engineering offer.” See also, *Mugler v. Kansas*,⁷⁰ in which the Court rejected a taking challenge to laws prohibiting the production or sale of intoxicating beverages.); *Goldblatt v. Town of Hempstead*,⁷¹ in which the Court upheld an ordinance which prohibited extraction of gravel below the groundwater level against taking claim due, in part, to the possible safety hazards posed by such open water pits. This ordinance effectively prevented any economic use of the land.

The Supreme Court in *Lingle v. Chevron U.S.A., Inc.*⁷² however raised the question to what extent the goals of regulations and the relationship of the regulatory standard to these goals

⁶⁶See, e.g., *Penn Central Transp. Co. v. New York City*, 438 U.S. 104, 124 (S.Ct., 1978); *Agins v. City of Tiburon*, 447 U.S. 255 (S.Ct., 1980).

⁶⁷*Penn Central Transp. Co. v. New York City*, 438 U.S. 104, 124 (S.Ct., 1978).

⁶⁸No. 95-667 L. 84 (Fed. Cl., 2004).

⁶⁹328 U.S. 80, 83 (S.Ct., 1946).

⁷⁰123 U.S. 623 (S.Ct., 1887).

⁷¹369 U.S. 590 (S.Ct., 1962).

⁷²544 U.S. 528 (S.Ct., 2005).

should be considered in deciding whether a taking has occurred. In interpreting *Lingle*, the federal court of appeals in *Rose Acre Farms v. U.S.*⁷³ held that health and safety considerations continue to be relevant to the “character of government action” in applying the Penn Central test for taking. The court held that “(W)e do not believe *Lingle* caused any diminution in the importance of Penn Central character prong, at least with respect to public health and safety regulations.”⁷⁴ Such a position makes sense but will need further clarification in the courts.

--Fourth, courts determine whether regulations impose unconstitutional conditions. Courts apply a fourth test for regulatory taking in circumstances in which imposition of an unconstitutional condition upon issuance or denial of a regulatory permit is a taking. The condition may involve an activity called for by a regulatory agency or the payment of a fee.

The U.S. Supreme Court has, over the last two decades, issued three decisions imposing quite stringent requirements on government exactions as a condition to issuing regulatory permits or subdivision approval, reasoning that “exactions” are analogous to physical taking. The U.S. Supreme Court in *Nollan v. California Coastal Commission*⁷⁵ held that an attempt by the California Coastal Commission to require a landowner to dedicate a public beach easement to the state in order to receive a building permit was a taking. In a later case, *Dolan v. City of Tigard*,⁷⁶ the Court held that city regulations for the 100 year floodplain which required a property owner to donate a 15 foot bike path along the stream were a taking. The Court stated that the municipality had to establish that the dedication/exaction conditions had to have an “essential nexus” to the regulatory goals and “rough proportionality” in “nature and extent to the impact of the proposed development.” In the third case, *Koontz v. St. Johns River Water Management District*⁷⁷ the Court broadly endorsed the essential nexus and rough proportionality tests of *Nolan* and *Dolan* and extended the application of these decisions to monetary exactions.

The decision poses new impediments for regulators. However, Justice Alito in the majority opinion recognized that landowners may be made to internalize the negative externalities of their conduct. He observed that “this is a hallmark of responsible land use policy and we have long sustained such regulations against constitutional attack.” The Court also noted that “our precedents thus enable permitting authorities to insist that applicants bear the full costs of their proposals...” Under *Nolan* and *Dolan* the government may choose whether and how a permit applicant is required to mitigate the impacts of a proposed development but it may not leverage its legitimate interest in mitigation to pursue government ends that lack an essential nexus and rough proportionality to those impacts while still forbidding the government from engaging in “out-and-out . . . extortion” that would thwart the Fifth Amendment right to just compensation.”

What This Means to Climate-Related Floodplain Regulations

Given the strong judicial support for floodplain regulations to date, future legal challenges to climate-related floodplain regulations on taking or other grounds will likely fail but

⁷³559 F.3d 1260 (Fed. Cir. 2009).

⁷⁴*Id.* at 1281.

⁷⁵483 U.S. 825 (S.Ct. 1987).

⁷⁶512 U.S. 374 (S.Ct., 1994).

⁷⁷ *Koontz v. St. Johns River Water Management District*, 570 U.S.____(2013), 133 S.C. 2586 (S.Ct. 2013).

governmental units need to be careful, particularly where such regulations could prevent all economic use of land. In such circumstances governments need to document with particular care offsite impacts of development. Recommendations for reducing potential liability are discussed below. Governments need to document health or safety threats with the use of hazard lands. They need to document access requirements during flood events. They need to document potential threats to emergency workers in case of a hurricane or inland storm. In some circumstances they may need to document “public trust” and government prescriptive rights for lands subject to tight regulations.

To avoid “per se” taking arguments, governments may take a “performance standards” approach to regulation. Governments need to coordinate real estate tax policies and regulations. In some instances governments need to purchase flood damage prone properties and not rely solely on regulations, particularly where active public use is desired.

WHY CLIMATE CHANGE-RELATED SUITS MAY BE SUCCESSFUL OVER TIME

As discussed above, no government has to date been successfully sued for damages for failing to take into account climate change in its policies or activities. Suits face substantial hurdles such as the sovereign immunity defense. Never the less successful suits seem quite possible over time for several reasons:

--Flood, landslide, avalanche and other natural hazards including but not limited to those caused or contributed to by climate change are becoming increasingly "foreseeable" and “predictable”. The potential for successful suits based upon negligence, nuisance, trespass, taking or other theories will increase as the techniques and capabilities for defining hazard areas and predicting hazard events improve and become more quantitative. With improved, quantitative predictive capability, hazard events become (to a greater or lesser extent) "foreseeable". Failing to take such hazards into account with resulting increased flooding may, under certain circumstances, constitute negligence, strict liability or a “taking”.⁷⁸

--Flood-related suits which are now quite common claiming that governments have increased flood, erosion, and related hazards on private lands in traditional, nonclimate change contexts may be expanded to include climate change-related flooding and erosion as well. Climate change may be one of several causes of increased flood heights or velocities and resulting damages in such suits.

--Advances are being made in the techniques available for reducing hazard losses including those from climate change-related flooding. Advances (e.g., computerized, automated flood warning systems) create an increasingly high standard of care for “reasonable conduct”. Governments, private landowners, architects, engineers and others are negligent if they fail to exercise "reasonable care". As technology advances, the techniques and approaches which

⁷⁸See, e.g., *Barr v. Game, Fish, and Parks Commission*, 497 P.2d 340 (Col., 1972); cert. den. (Col., (1972)).

must be applied by engineers, architects and others for "reasonable conduct", judged by the practices applied by their profession in their region, also advance. Architects and engineers must demonstrate a level of knowledge and expertise equal to that of architects and engineers in their region.⁷⁹ Widespread dissemination of information concerning techniques for reducing flood and erosion losses through magazines, technical journals, and reports, has also broadened the concept of "region" so that it may be argued that a broad if not national standard of professional reasonableness now exists.

--Advances are being made in natural hazard modeling techniques available to establish causation, the reasonableness of conduct, and damages. Fifty years ago, it was very difficult for a landowner to prove that a particular activity increased flooding, subsidence, erosion, or other hazards on his or her land. This was particularly true when the increase was due to multiple activities on many lands such as increased flooding due to development throughout a watershed. Today, sophisticated modeling techniques facilitate proof of causation and allocation of fault including cumulative impacts and this analytical and predictive capability will improve and become more accurate over time.⁸⁰

--Courts are making it increasingly difficult to establish the defenses of "act of God", "contributory negligence" and "assumption of risk". Traditionally, "act of God" contributory negligence (i.e., actions which contribute to the injury or loss), and assumption of risk were partial or total defenses to negligence. Today, many states have adopted comparative negligence statutes which substitute comparative negligence for contributory negligence. Such statutes permit recovery (based upon percentage of fault) even where the claimant has been partially negligent. In a somewhat similar vein, courts have curtailed the "assumption of risk" doctrine and have held, in some cases, that even an explicit assumption of risk is no defense against a negligence law suit.⁸¹

CONCLUDING REMARKS: STAYING OUT OF TROUBLE

Over time, climate-related natural hazards will be increasingly quantified, foreseeable and predictable with improved computer models and global and regional monitoring. As this occurs, governments may well be held liable for failing to anticipate flooding in areas which have not previously flooded and/or for exacerbating existing flood problems. Governments need to be particularly careful with their policies for areas behind dikes, dams, and levees where catastrophic losses may occur if design frequencies are exceeded and the legal doctrine of "strict liability" may apply.

⁷⁹See generally Annot., "Architect's Liability for Personal Injury or Death Allegedly Caused by Improper or Defective Plans or Designs," 97 A.L.R.3d 455 (1980).

⁸⁰For a case in which flood models were used See, e.g., *Lea Company v. North Carolina Board of Transportation*, 304 S.E.2d 164 (N.C., 1983).

⁸¹See e.g., *Santa Barbara v. Superior Court*, 161 P.3d 1095 (Calif., 2007) and cases cited therein. (Express assumption of risk made in context of recreation program for future gross negligence was held unenforceable as a matter of public policy.)

Human-induced climate change and the flood damages due to these changes will likely be with us for a long time. To avoid or reduce potential litigation, governments could best approach climate change proactively as suggested by the measures described below and in Box 1. They should evaluate the impacts of climate change on their programs and upon private landowners. They should take steps to reduce and compensate for impacts. Such actions would make sense from public policy perspectives. And they would help governments meet claims that they have acted negligently (“unreasonably”) in a specific instance.

Courts have broadly upheld tight floodplain regulations in more traditional contexts over the last several decades and are likely to continue to do. Governments may adopt, with considerable confidence, tightened floodplain and erosion area regulations incorporating climate change projections. However, governments should approach regulation of private lands with particular care where the regulations may deny landowners all economic use of entire parcels of private land and the proposed uses lack public trust, nuisance, or public safety considerations. More detailed and accurate flood data are desirable for such areas as well as documentation of nuisance impacts and threats to safety.

Reduce Potential Government Liability for Failing to Consider Climate Change

To reduce potential liability for failure to consider climate change, governments could begin with a look at potential impacts of climate changes on their governmental unit and the impact, in turn, upon private lands. Such a look would support government arguments that they are responding “reasonably” (nonnegligently) to climate change and help them avoid liability from more traditional flooding as well. Other measures for reducing potential liability include:

- **Do not locate damage-prone government buildings such as post offices, roads, and sewer and water lines in flood areas taking into account not only traditional flooding but climate-change related flooding and erosion.**
- **Map areas** with climate change-related flooding or erosion; reflect these mapped hazard areas in government policies and activities including flood regulatory maps.
- **Deny zoning, subdivision, and building code permits** for residences and other structures if proposed activities will increase hazards on other lands, anticipating climate change.
- **Relocate public and private flood prone structures** outside of hazard areas taking into account climate-change and related flood hazards. Relocation of flood damage-prone development is particularly appropriate for long duration or permanent flooding such as coastal flood areas affected by sea level rise.
- **Acquire properties subject to climate change flooding proactively and allocate them to park, greenway and other government uses with low flood damage potential.** Such

acquisitions are often “low risk” and “no regret” options⁸² because they would often make sense whether or not projected climate changes occur. Acquisition of flood prone areas could often simultaneously protect flood storage and protect wildlife, provide outdoor recreation, prevent drainage problems, and reduce future flood losses.

- **Acquire flood easements** where government activities will increase hazards taking into account anticipated climate change. For example, the U.S. Army Corps of Engineers has broadly purchased flowage easements from private landowners where lands may be periodically inundated by Corps dams and levees and other projects. Easement acquisition could be more broadly extended to climate change flood areas.
- **Include disclaimers in maps, building permits and subdivision approvals pertaining to potential climate-related flood damages.** Regulatory agencies could require that permit applicants agree to hold harmless governmental units if permitted buildings or activities are subject to climate change-related and other natural hazards and damages. For example, some states such as Minnesota and Wisconsin have adopted model floodplain ordinances for use by local governments containing disclaimers pertaining to the accuracy of flood maps and the magnitude of the regulatory flood. These disclaimers could be extended to broader climate change-related flooding and erosion.
- **Encourage communities to enroll in FEMA’s National Flood Insurance Program including the Community Rating system if communities have not already done so.** Landowners who are compensated by flood insurance for their flood losses are, as a practical matter, less likely to sue governments for climate-related and other types of flooding.
- **Reduce climate-related flood hazards to or below naturally occurring levels** through structural and nonstructural loss reduction measures such as wetland and riparian area restoration, flood warning systems, public acquisition of greenways, construction of dikes, dams, levees, flood proofing and other approaches. In general, governments are only liable for increasing flood hazards and damages, not for natural levels of flooding. However construction of structural measures should be approached with particular care including consideration of “residual risk” because flood control measures such as levees often decrease flood hazards at one location and increase hazards at another or decrease for small flood events but increase for large scale events where flood frequency engineering designs are exceeded.

Reduce the Potential for Successful “Taking” Challenges to Restrictive Floodplain Regulations

Governments can also take a variety of measures to reduce the potential for successful taking challenges to regulations:

⁸²See, e.g., Rasmus Heltberg, Paul Bennett Siegel, and Steen Lau Jorgensen Addressing Human Vulnerability to Climate Change: Toward a ‘No Regrets Approach, World Bank (2008)
http://siteresources.worldbank.org/EXTSOCIALPROTECTION/Resources/Climate_Change_and_SRM_FINAL.pdf

- **To reduce the potential for successful “taking” challenges to highly restrictive floodplain regulations governments may best apply a “performance standard” approach.** Courts have broadly upheld tight performance standard floodplain regulations in more traditional contexts over the last several decades and are likely to continue to do so for climate change caused or exacerbated flooding. However, governments should approach regulation of private lands with particular care where the regulations may deny landowners all economic use of entire parcels of private land and the uses proposed by landowners lack public trust, nuisance, or public safety considerations. Such performance standards include prohibition of activities which threaten the health and safety of floodplain occupants and prohibition of activities which will increase flood heights or velocities on adjacent lands.
- **If governments attach conditions to development permits such as flood proofing requirements or preservation of floodway areas related to climate change, governments should make sure that conditions are reasonable and reasonably related to the impacts of the development on floodplain resources.** They should be particularly careful if dedications of land are required with the goal of providing public use of areas.
- **Governments should map high velocity, erosion, flash flooding and other high risk areas posing particular threats to health and safety or increasing flood hazards on other lands (e.g., floodways) to provide the basis for restrictive regulations.**
- **Governments should identify areas where protection of the areas from development may serve not only to reduce climate change-related flood losses and potential liability but protect wetlands and other sensitive areas,** protect and enhance water quality, provide recreation, and serve other objectives. Acquisition and maintenance of such areas as parks, greenways, and bike paths will often be “no regret” options because they can be justified not only to reduce climate change-related flood losses and potential liability but to serve a variety of other objectives.
- **Governments could adopt and implement a “no adverse impact” flood standard** reflecting climate change⁸³ as well as more traditional types of flooding. Application of a nondiscriminatory overall no adverse impact standard in regulations and even-handed administration and enforcement of such a standard could reduce the possibility of successful due process or “taking” legal challenges of floodplain regulations.

⁸³Governments can implement this goal through regulatory and nonregulatory approaches. Adoption of a “no adverse flooding impact” standard reflecting reasonably anticipated climate change will provide an even-handed overall standard for private and public activities in floodplains. This will increase the chances courts will uphold regulations since courts are particularly sensitive to “fairness” and “evenhandedness” in addressing taking claims. For discussion of the no adverse impact standard see Larson, Larry & Doug. Plasencia, No Adverse Impact: A New Direction in Floodplain Management Policy, Natural Hazards Review (2001); No Adverse Impact, Association of State Floodplain Managers web site. <http://www.floods.org/NoAdverseImpact/whitepaper.asp>; Kusler, J. & E. Thomas, No Adverse Impact Floodplain Management and the Courts, Association of State Floodplain Managers (2003) http://www.floods.org/PDF/ASFPM_NAI_Legal_Paper_1107.pdf

Box 1
Some Suggested Steps for Governments in Addressing Climate Change

Scientists broadly agree that climate changes due to human activities are occurring. There is less agreement concerning the amounts of change, where the changes will occur, the impacts of change on flooding and erosion, and what policies should be applied to particular activities at specific locations in light of these changes.

What steps might governments take in formulating and implementing flood loss reduction efforts reflecting climate change? Some suggestions include:

1. Take a careful look at potential climate change flood-related impacts. A first step already taken by some units of government but needed by many others would be to take a careful look at the impact of climate change on their government policies and programs and how these affect “what happens on the ground”. For example, an agency designing and building flood control structures for a coastal area could calculate and map the impacts of sea level rise on public and private development. Such analyses may, then, provide the basis for developing and selecting among management alternatives such as elevation of structures versus adoption of setbacks. Taking a “hard look” is consistent with NEPA and “baby NEPA” environmental impact requirements at the federal, state, and local levels. It is consistent with requirements that governments act “reasonably” to avoid common law claims of negligence.

Many governments are taking a “wait and see” position and are making no or little effort to factor climate change into their programs including design of levees, dams, groins, sea walls, channels, stormwater systems and other flood reduction measures, flood plain regulations, evacuation plans, etc. This position may be justified where preliminary estimates of climate change suggest there will be no or little increase or decrease in precipitation, sea level, or other climate change impacts. But (arguably) this position is not justified and may be considered “unreasonable” from a negligence perspective where there will be large projected climate-related flooding with severe damages such as permanent flooding of an area from sea level rise or overtopping of a levee with loss of life. No action may be unreasonable where the costs of measures to anticipate and reduce the flood-related impacts of climate change are relatively low such as adding multiobjective freeboard in flood protection elevations. Such freeboard may also, in many instances, be based in part upon residual risks from more traditional causes of flooding and erosion (possible levee collapse), watershed urbanization, wave run-up and other factors.

2. Undertake more detailed assessments of flood and flood damage potential as needed. A second step, building upon the first step, would be for governments to take a more detailed look at climate change and climate change damages at sites where a hard look (above) suggests there may be serious problems. This approach may involve more detailed, computer analysis of projected changes in flood elevations and velocities combined with scenario analysis to evaluate the potential impact of specific climate changes on specific activities at particular sites such as the flood damage potential of areas and activities subject to sea level rise.

3. Identify management options including “low risk” and “no regret” scenarios such as wetland, riparian and floodplain restoration (where applicable). Having evaluated potential impacts and damages and taking into account other relevant factors, a government body is then in a position to decide what would be reasonable sea level rise and flooding options for particular activities in particular areas such as added flood freeboard and added set back lines on a barrier island. These will often include “low risk and “no regret” multiobjective policies such as establishment of building setbacks and greenways and establishment of green infrastructure such as multiobjective stormwater management measures. A wide variety of “low risk” and “no regret” management options may make sense (depending upon the context), where the magnitude of climate change and resulting flooding and erosion impacts are quite certain. Policies need to reflect not only the severity of hazard but the vulnerability of activities to flood and erosion damage. For example, critical facilities such as nuclear power plants should be prohibited where there is any danger from flooding or erosion. The melt-downs of three nuclear reactors in Fukushima, Japan caused by a massive tsunami in 2011 are clear examples of the risk associated with siting sensitive and/or hazardous infrastructure and facilities in areas with projected climate change flooding.

4. Implement management options including policies for both public and private lands. A fourth step would be to integrate this assessment information into broader, multiobjective land and water management, watershed management, and floodplain management efforts including local comprehensive planning. For example, the acquisition of riverine greenways may simultaneously reduce nonclimate change induced flooding from watershed development, climate changed induced flooding from increased precipitation, and potential law suits based upon flood damages from both nonclimate change induced and climate change induced flooding. It may also reduce water pollution, protect fish and wildlife, and provide public recreational opportunities. Multiobjective floodplain acquisition programs are often both “low risk” and “no regret” because they may be economically and ecologically justified whether or not climate change occurs. Another example of “low risk” and “no regret” measure is adding freeboard to flood protection elevations for levees, houses, and subdivisions to reduce flood damage from watershed development as well as to address climate change.

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www.nrdc.org/globalWarming/depth.asp

APPENDIX B: OTHER LEGAL CHALLENGES

As discussed above, governments may be sued for failing to consider climate change in their government activities based upon a variety of legal theories already discussed. The remedy sought by many plaintiffs is damages. Governments may also be sued pursuant to a number of other legal theories such as those below which, if successful, could compel governments to consider climate change in their decision-making but would not necessarily involve award of monetary damages.

National Environmental Policy Act (NEPA) Litigation

Plaintiffs in several cases have successfully argued that federal agencies or states have failed to take a sufficiently careful look at the environmental impacts of their contributions to climate change pursuant to the requirements of the National Environmental Policy Act (NEPA) and state “baby” NEPA’s. See, for example, the *Center for Biological Diversity v. Nat’l Highway Traffic Safety Admin.*⁸⁴ in which the court held that the agency’s environmental impact statement was inadequate and ordered the agency to revise their impact statement.:

Thus, the fact that "climate change is largely a global phenomenon that includes actions that are outside of [the agency's] control . . . does not release the agency from the duty of assessing the effects of *its* actions on global warming within the context of other actions that also affect global warming." *States' Gray Br.* at 15 (emphasis added). The cumulative impacts regulation specifically provides that the agency must assess the "impact of the action when added to other past, present, and reasonably foreseeable future actions *regardless of what agency (Federal or non-Federal) or person undertakes such other actions.*" 40 C.F.R. § 1508.7; *see also Res. Ltd., Inc. v. Robertson*, 35 F.3d 1300, 1306 (9th Cir. 1994)

As noted above, these suits have not been for damages.

Endangered Species Litigation

This category of litigation involves claims by environmental organizations and government agencies that the Department of Interior and/or other agencies are failing to adequately protect endangered species or potentially endangered species from climate change. Courts in some cases have held that federal agencies have inadequately evaluated the impacts of climate change on specific species.⁸⁵ For example, in *Natural Resources Council v. Kempthorne*,⁸⁶ a federal district court held that a 2005 biological opinion “no jeopardy finding” for Delta Smelt pursuant to the Endangered Species Act was arbitrary, capricious, and contrary to law because the agencies failed to take into account climate change. See also *South Yuba River Citizens League v. NMFS*.⁸⁷ (Biological Opinion inadequate pertaining to the endangered Chinook salmon, the

⁸⁴538 F.3d 1172, 1217 (9th Cir. 2008).

⁸⁵See, e.g., *Natural Resources Council v. Kempthorne*, 506 F. Sup.2d 322 (E.D.Cal. 2007).

⁸⁶506 F. Sup.2d 322 (D.Cal. 2007).

⁸⁷723 F. Supp.2d 1247 (D.Cal. 2010).

distinct population segment of Central Valley steelhead ("steelhead"), and the southern distinct population segment of North American green sturgeon.)

Claims that Governments Are Failing to Protect the Public Trust By Inadequately Regulating Omissions of Greenhouse Gases

Our Children's Trust in cooperation with other organizations has filed suits in a number of states claiming that polluters causing climate change have failed to protect the public trust. None of these suits have gone to trial but a Texas suit has survived preliminary legal challenges. The suit sought judicial declaration that states have a duty to future generations with regard to an "atmospheric trust".⁸⁸

Clean Air Litigation

In these cases, governments, environmental not for profits and others have sued industries claiming that they have released atmospheric gases which, in turn, have increased global temperatures and produced various types of flood and erosion damages.⁸⁹ Plaintiffs have claimed that polluters should be held liable under the Clean Air Act for damages caused by climate change. Plaintiffs have also argued that EPA must adopt regulations regulating the emissions of carbon. Although none of these suits for damages have succeeded, the Supreme Court in *Massachusetts v. EPA* (S. Ct., 2007)⁹⁰ held that the Clean Air Act authorizes federal regulation of emissions of carbon dioxide and other greenhouse gases, and that the Environmental Protection Agency (EPA) had misread that Act when it denied a rulemaking petition seeking controls on greenhouse gas emissions from new motor vehicles. EPA is now drafting such regulations. On August 3, 2015, the EPA issued the Clean Power Plan, which put the nation on track to cut harmful pollution from the power sector by 32 percent below 2005 levels, while also cutting smog-and soot-forming emissions that threaten public health by 20 percent.

⁸⁸See Klass, A., *Federalism at Work: Recent Development in Public Trust Law Suits to Limit Greenhouse Gas Emissions*, CPR Blog, (July 13, 2012), <http://ourchildrenstrust.org/sites/default/files/2012.07.18-Federalism%20at%20Work%20%28Center%20for%20Progressive%20Reform:NM%20and%20TX%20decisions%29.pdf>; Klass,A., *Renewable Energy and the Public Trust Doctrine*, (March 17, 2011). 45 U.C. Davis L. Rev. 1021 (2012), http://lawreview.law.ucdavis.edu/issues/45/3/Topic/45-3_Klass.pdf; Klass,A., *Modern Public Trust Principles: Recognizing Rights and Integrating Standards*, Notre Dame L. Rev. Vol 82 p 699 (2006), <http://scholarship.law.nd.edu/cgi/viewcontent.cgi?article=1295&context=ndlr> Bannerman, H., *Atmospheric Litigation: The Public Trust Approach to Climate Change*, see http://studentorgs.law.unc.edu/documents/elp/2012/bannerman_final.pdf

⁸⁹Rulemaking is the principal remedy although plaintiffs have also sought damages.

⁹⁰549 U. S. 497 (S. Ct., 2007).

APPENDIX C: DEFENSES TO CLIMATE-RELATED HAZARD LITIGATION

Agencies have a number of defenses to hazard-related litigation where landowners argue that governments have failed to consider climate change in their policies or activities and damage has resulted. Some major defenses include the following:

--**The plaintiff does not have “standing” to bring suit.**⁹¹ This has been a commonly pleaded defense in climate change-related litigation to date. Defendants have successfully argued in some cases that climate change is a global issue and does not support “standing.”⁹² However, landowners damaged by increased flooding and erosion caused by failing to take into account climate change will (arguably) be able to show the sorts of particularized damages necessary for establishing standing. See, for example, the U.S. Supreme Court in *Massachusetts v. EPA*⁹³ in which the Court concluded that Massachusetts had standing to challenge EPA’s failure to regulate greenhouse gases pursuant to the Clean Air Act based, in part, upon the state’s ownership of land which would be damaged by rising sea levels.

A landowner damaged by failure to take into account climate change would not need to show that a defendant’s actions were the sole cause of injury but rather one which “contributes to” the kinds of injuries alleged by plaintiff.”

--**Global warming is a “political question”.** Another defense raised in climate-related cases to date is that global warming is a “political” question and government climate change-related policies should be decided by Congress or federal agencies (e.g., EPA) rather than the courts. See, for example, *Native Village of Kivalina v. Exxon Mobil Corporation*⁹⁴. The court in this case observed that “...the political question doctrine is a species of the separation of powers doctrine and provides that certain questions are political as opposed to legal, and thus, must be resolved by the political branches rather than by the judiciary.”

Some global warming issues are clearly political in nature such as Congressional appropriation of funds for beach nourishment to address sea level rise and loss of dunes. However a suit based upon nuisance, negligence, or other state common law cause of action or a suit based upon inverse condemnation would be based upon well-established landowner property law rights and duties rather than a broad political question. The U.S. Court of Appeals, 5th Circuit in a climate change-related case, *Comer v. Murphy Oil*,⁹⁵ summarized court decisions applying to the “political question” in the following useful manner (Id. at 873, 874, case citations omitted):

⁹¹See generally, *Bennett v. Spear*, 520 U.S. 154 (S.Ct. 1997); Harper, Benjamin, *Climate Change, Insurance, NEPA, and Article III: Does a Policy Holder Have Standing to Sue a Federal Agency for Failing to Address Climate Change Under NEPA?*, 74 *UMKC L. Rev.* 435 (2005).

⁹²See, e.g., *Native Village of Kivalina v. Exxonmobil Corporation*, 663 F. Supp.2d 863 (D.Cal.. 2009).

⁹³549 U.S. 497 (S.Ct. 2007).

⁹⁴663 F. Supp.2d 863, 871 (D.Cal. 2009).

⁹⁵*Comer v. Murphy Oil*, 585 F.3d 855 (5th Cr. 2009). It is to be noted however that this decision was withdrawn due to lack of a judicial quorum and has, therefore, no legal precedent value although it does provide a useful summary of case law.

Common-law tort claims are rarely thought to present nonjusticiable political questions. Three Circuits have stated, in the political question context, that "the common law of tort provides clear and well-settled rules on which the district court can easily rely...."

The Fifth Circuit has similarly observed that, "when faced with an 'ordinary tort suit,' the textual commitment factor actually weighs in favor of resolution by the judiciary." And the Tenth Circuit, in a case governed by state negligence law, stated that "the political question theory . . . do[es] not ordinarily prevent individual tort recoveries." ...Claims for damages are also considerably less likely to present nonjusticiable political questions, compared with claims for injunctive relief. Indeed, the Fifth Circuit ...categorically stated that "monetary damages . . . do not . . . constitute a form of relief that is not judicially manageable...."

--**Governments have no affirmative duty to remedy naturally occurring hazards.** Courts have, in traditional flood contexts, held that, absent a statutory or other duty, landowners and governments have no affirmative duty to remedy **naturally occurring** hazards on private or public lands as long as they **do not increase** such hazards⁹⁶. This includes no duty to adopt regulations or to construct hazard reduction structures such as dams. Courts have also held that landowners and governments ordinarily have no duty to warn visitors, invitees, trespassers, or members of the general public for naturally occurring hazards on public lands not exacerbated or created by governments. However, there are exceptions to this general rule of no affirmative duty and a gradual trend in the courts to broaden the exceptions.⁹⁷ For example, some governmental units may be directly or indirectly required by specific statutes or regulations to consider climate change in their actions and failure to do so may, at the minimum, be evidence of negligence. For example, the Security Exchange Commission (SEC)⁹⁸ has issued guidelines requiring companies to evaluate climate change impacts. This might be interpreted as creating a duty to do so. In addition it can be argued that climate change-related flooding is not "naturally occurring" and increases natural levels of flood and erosion hazard.

⁹⁶See, e.g., *Allain-Lebreton, Co. v. Dept. of Army, etc.*, 670 F.2d 43 (5th Cir., 1982) (Decision by Army Corps of Engineers not to locate hurricane protection levee on property owner's land and thereby to reduce naturally occurring flood damage was not a unconstitutional taking of property.); *Tri-Chem Inc. v. Los Angeles County Flood Control District*, 132 Cal. Rptr. 142 (Calif., 1976) (County has no duty to construct flood control system adequate to handle infrequent floods for area that acts as natural sump.); *Goldstein v. County of Monroe*, 432 N.Y.S.2d 966 (N.Y., 1980) (Municipal corporation is not liable for failing to restrain waters between banks of creek or keep channel free from obstruction it did not cause.); *Vanguard Tours, Inc. v. Town of Yorktown*, 83 A.D.2d 866 (N.Y., 1981) (Municipality is not liable for its failure to install a drainage system which adequately disposes of surface waters.).

⁹⁷See *Bowman & Bailey*, "Negligence in the Realms of Public Law--A Positive Obligation to Rescue", 1984 Pub. L. 277; *McNiece & Thornton*, "Affirmative Duties in Tort Following *Tarasoff*", 58 Yale L.J. 1272 (1948-1949).

⁹⁸The Security Exchange Commission on January 27, 2000 issued guidance requiring that companies consider the effects of global warming and efforts to curb climate change when disclosing business risks to investors.

But, courts have also held that once a governmental unit elects to undertake government activities, even where no affirmative duty exists for such action, it must exercise reasonable care. See, e.g., *Indian Towing v. United States*.⁹⁹ This is often referred to as the "Good Samaritan" rule. Although a public entity or private individual ordinarily has no duty to provide aid to an individual in distress not caused by the public entity or private individual, once a governmental unit (or a private individual) provides aid, it must do so with ordinary care.

--**Preemption.** A preemption defense involves a claim that federal authority bars (preempts) state regulation such as state regulation of gases which cause climate change. See *Connecticut v. American Electric Power Company, Inc.* above. For cases holding that the Clean Air Act preempts state nuisance claims see, e.g., *U.S. v. Eme Homer City Generation*;¹⁰⁰ *North Carolina, ex rel. Cooper v. Tennessee Valley Authority*.¹⁰¹

--**There has been inadequate proof of causation.** Governments may be able to defend themselves in some climate-related flood cases by arguing that landowners have not provided adequate proof or causation between the government acts and increased flood problems. The plaintiff has the burden of proving that government acts were the cause of the alleged damages. Proof of causation is a factual issue and one not easily met when there are many possible causes for increasing flood damages. See, e.g., *Village of Kivalina v. Exxonmobil Corporation*¹⁰². However, the U.S. Supreme Court concluded in *Massachusetts v. EPA*¹⁰³ that the impacts of climate change, while "widely shared", did not minimize the state of Massachusetts's interest in the outcome of the litigation and the state had standing to challenge the failure of EPA to adopt regulations for greenhouse gases. The Supreme Court in this case recognized the causal relationship between global warming and damages. Recognition by the Supreme Court of this causal relationship should help plaintiffs in future suits establish the relationship between global warming and a variety of damages in more specific contexts. As a California court observed in a landslide case, a public entity may be liable for natural-hazard related injuries "even if its project was only one of several 'substantial' concurring causes of damage."¹⁰⁴

In some instances, particularly where an ultrahazardous activity such as a dam has caused the damage, the plaintiff may be aided by the doctrine of *res ipsa loquitur* (the event speaks for itself). See Annot., *Res Ipsa Loquitur as Applicable in Actions for Damage to Property by the Overflow or Escape of Water*, 61 A.L.R.3d 186 (1975) also 11 A.L.R.2d 1179 (1950). Short of strict liability, a North Carolina court in *Bowling v. City of Oxford*¹⁰⁵ held that evidence that the city knew of a leak in a water supply dam created a prima facie case of negligence. This, however, did not relieve the injured party from the burden of proving negligence. The court held that *res ipsa* merely makes a "prima facie case of injury by negligence so as to place upon the

⁹⁹350 U.S. 61 (S.Ct., 1955).

¹⁰⁰823 F. Supp.2d 274 (2011).

¹⁰¹615 F.3d 291 (4th Cir. 2010).

¹⁰²663 F. Supp.2d 863 (N.D.Cal. 2009).

¹⁰³*Mass. v. EPA*, 549 U.S. 497 (S.Ct. 2007). It is to be noted that the Court faced intertwined causation and standing issues.

¹⁰⁴See *Souza v. Silver Development Co.*, 164 Cal. App. 3rd 165, 171 (Cal. 1985), 210 Cal. Rptr. 146 (Calif., 1985).

¹⁰⁵148 S.E.2d 624 (N.C., 1966).

defendant the burden of going forward with evidence to explain the occurrence."¹⁰⁶ However, some courts have refused to apply the *res ipsa loquitor* presumption to flooding because the landowner did not have "exclusive control" over the instrumentalities (the flooding) that caused an injury.¹⁰⁷

--**Government actions are "reasonable"**. To defend themselves from an allegation of negligence ("unreasonable action") governments can argue that their actions or inactions are, in fact, reasonable taking into account the standard of conduct in the community, severity of the harm posed, foreseeability of harm and other factors. As discussed above, the standard of conduct is that of a "reasonable man" in the circumstances.

--**The decision to address or not to address climate change in flood calculations is "discretionary" and, therefore, not subject to a negligence claim because such a decision involves a variety of assumptions and policy issues.** The Federal Tort Claims Act allows under some circumstances **private individuals to sue federal agencies for "negligence" or "wrongful" acts**¹⁰⁸. However, the Act contains a number of exceptions including "any claim...based upon the exercise or performance or the failure to exercise or perform a discretionary function or duty on the part of a federal agency or an employee of the government whether or not the discretion involved be abused..."¹⁰⁹ A discretionary act defense is also often available to local governments and state governments under state common law or state tort claim acts in many states.

Unfortunately, the Federal Tort Claims Act does not define "discretionary" function or duty and this has resulted in a good deal of litigation. As a practical matter, almost all government decisions involve some measure of discretion. Large scale policy decisions are clearly discretionary such as a legislative decision whether or not to construct a major interstate highway. But nitty-gritty decisions also involve discretion such as a decision to repair a road on one particular day rather than another, the repair materials to be used, and who will carry out the task.

In *Indian Towing Co. v. United States*,¹¹⁰ the Supreme Court took the opportunity to clarify (somewhat) the discretionary versus operational distinction. The Court allowed to go forward a law suit for damage to a barge and its cargo when a tug pulling the barge ran aground due to the Coast Guard's negligence in failing to properly operate a lighthouse. The Court held that the decision to operate a lighthouse at that location was a discretionary function but that actual operation was subject to a negligence suit. The Court observed that "one who undertakes to warn the public of danger and thereby induces reliance must perform his 'Good Samaritan' task in a

¹⁰⁶Id. at 629.

¹⁰⁷See, e.g., *Oak Leaf Country Club, Inc. v. Wilson*, 257 N.W.2d 739 (Ia., 1977).

¹⁰⁸The Federal Tort Claims Act, 28 U.S.C. 1346(b) provides, in part, that federal sovereign immunity is waived for "injury or loss of property, or person injury or death caused by the negligent or wrongful act or omission of any employee of the Government while acting within the scope of his office or employment...."

¹⁰⁹28 U.S.C. 2680(a).

¹¹⁰350 U.S. 61 (S.Ct., 1955).

careful manner." *Id.* at 64. In the lower federal courts, the 5th Circuit court in *Greer v. United States*,¹¹¹ similarly held that the Coast Guard had discretion with regard to whether it provided a navigational buoy but failure to correct the dislocation of a buoy despite warnings that it had moved from its charted position was negligence since the Coast Guard had charted the location of the buoy and boaters relied on the charted location.

The U.S. Supreme Court and lower federal courts have been asked a number of times to decide if weather forecasts are the exercise of a discretionary function. The courts have consistently held that forecasts are, in themselves, discretionary. See, e.g., *National Manufacturing Co. v. United States*,¹¹² (National Weather Bureau could not be sued for disseminating erroneous flood and weather information due, in part, to discretionary nature of forecasts.); *Brown v. United States*,¹¹³ (N.O.A.A. could not be sued for failure to predict a hurricane due in part to inoperable weather buoy. However, in *Pierce v. United States*,¹¹⁴ the 6th Circuit held that "(s)ince the FAA has undertaken to advise requesting pilots of weather conditions, thus engendering reliance...it is under a duty to see that information which it furnishes is accurate and complete."

For flood-related cases applying the discretionary function exception see, e.g., *Vaizburd v. United States*,¹¹⁵ (Court held that Corps had used discretion in design, planning and implementation of a flood control project to reduce storm damage and protect a shoreline and was therefore not liable for negligence.); *United States v. Ure*,¹¹⁶ (Court held that flooding of property due to burst of irrigation canal caused by the use of weaker materials was discretionary.); *Valley Cattle Co. v. United States*,¹¹⁷ (Court held that federal government was not negligent and liable for flood damage caused by flood preparations for a "two year storm" because this planning was discretionary.)

--Flooding and flood damages are subject to the flood exemption contained in the Flood Control Act of 1936. Federal agencies may be able to defend themselves in the construction and operation of flood control facilities affected by climate change by pleading not only the "discretionary" section of the federal Tort Claims Act but section 702c of the Federal Flood Control Act of 1936 (33 U.S.C. 702c (1986)). This important statutory exception to liability may be held to apply to some types of climate change-related flood damages caused by federal agencies. It provides, more specifically that "(n)o liability of any kind shall attach to or rest upon the United States for any damage from or by floods or flood waters at any place." *Id.* See *Central Green Co. v. United States*.¹¹⁸

Federal courts have, in some instances, gone so far as to characterize federal flood forecasts and even federal floodplain mapping as "flood control" and therefore not subject to tort actions for

¹¹¹505 F.2d 90 (5th Cir., 1974).

¹¹²210 F.2d 263 (8th Cir., 1954) cert. denied, 347 U.S. 967 (S.Ct., 1954).

¹¹³790 F.2d 199 (1st Cir., 1986).

¹¹⁴679 F.2d 617, 621 (6th Cir., 1982).

¹¹⁵90 F.Supp. 2d 210 (E.D.N.Y.,2000).

¹¹⁶225 F.2d 709 (9th Cir., 1955).

¹¹⁷*Valley Cattle Co. v. United States*, 258 F.Supp. 12 (D.Haw. 1966).

¹¹⁸531 U.S. 425, 426 (S.Ct., 2001).

negligence. See, e.g., *Britt v. United States*¹¹⁹ (Court held that property owners had no claim of negligence against the U.S. for preparing and disseminating inaccurate flood maps due to “flood control” exemption in Federal Tort Claims Act.); *Fortner v. Tennessee Valley Authority*¹²⁰ (Flood warnings related to operation of dams for flood control subject to immunity.).

The outer limits of the flood control exemption are being tested in the suits filed by individuals damaged by Hurricane Katrina. See *Re Katrina Canal Breaches Consolidated Litigation*¹²¹ in which the Court of Appeals at first held, citing *Central Green*, supra, that the 702c exemption did apply to levees around the London Avenue Canal. But, the Court of Claims held that it did not apply. See *In re Katrina Canal Breaches*;¹²² *St. Bernard Parish v. United States*, No. 05-1119 L. May 1, 2015.¹²³

--Flooding was an “Act of God”. Governments in more traditional flooding cases have often attempted to defend themselves by arguing that a specific flood event was an “act of God” although it is increasingly difficult to establish the elements of an act of God defense for reasons discussed below. Since the 16th century, “Act of God” has been recognized by courts as a common law defense to negligence, nuisance, and trespass. It has also be recognized as a defense in some contract cases (depending upon the language and terms of the contract) and as a defense in some physical “takings” cases. In addition, it is a defense in some statutory liability contexts such as liability for oil spills.

The “Act of God” defense is based upon the belief that one should not be held responsible for what cannot be reasonably anticipated or guarded against. It is a defense that must be affirmatively pleaded and proven by the defendant. It is a defense which was at one time much more broadly allowed by the courts. Today the defense is, most often, narrowly construed. See, e.g., *Sabine Towing and Transp. Co. Inc., v. U.S.*¹²⁴ in which the court held that spring runoff was not an “act of God” which would excuse an oil spill.

The cases dealing with “Act of God” defense focus on two important hazard issues common to hazard-related cases in general and often litigated: the foreseeability of various hazard events, and the magnitude of the events.

To prove “Act of God”, the defendant must establish to the satisfaction of the jury or court (issues of fact) that 1) the event falls within the legal definition of “Act of God” and that 2) the

¹¹⁹515 F. Supp. 1159 (D. Ala., 1981).

¹²⁰No. 3:04-CV-363 (E.D., Tenn., 2005).

¹²¹673 F.3d 381 (5th Cir., 2012).

¹²²696 F.3d 436 (5th Cir. 2012).

¹²³See *In Re Katrina Canal Breaches Litigation*, 673 F.3d 381 (5th Cir. 2012); 696 F.3d 436 (5th Cir. 2012). See also Brougher, C., *Flood Damage Related to Army Corps of Engineers Projects: Selected Legal Issues*, Congressional Research Service (June 7, 2011). <https://takingslitigation.files.wordpress.com/2015/05/05-1119-opinion-and-order-on-liability.pdf>

¹²⁴666 F.2d 561 (Ct. Cl., 1981).

"Act of God" and not the defendant's negligence was the proximate cause of the damage.

To prove that an event falls within the legal definition of "Act of God", courts have held that the defendant must more specifically prove that:

- the event is an act of nature (hurricanes, storms, earthquakes, floods), not man,
- the event is unprecedented or at least very large scale,
- the event and resulting damage could not reasonably have been "anticipated" or prevented, and
- the event was the proximate cause of the damage or injury.

Compliance with these requirements which may be stated as questions is proving increasingly difficult:

--Was the event an act of nature? An "Act of God" is "due directly and exclusively to natural causes without human intervention...." See *Northwestern Bell Tel. Co. v. Henry Carlson Co.*,¹²⁵ It "excludes the idea of a human agency and where the cause considered is found to be in part the result of the participation of man....(T)he whole occurrence is thereby humanized,...and removed from the operation of the rules applicable to the acts of God." See *Dempsey v. City of Souris*¹²⁶ (Discharge of untreated sewage from city sewage lagoon due in part to excessive rainfall was not an "Act of God.")

Although meteorological events (hurricanes, storms, tornadoes, lightning) continue to occur as they have throughout history, most often the actual cause of damage is no longer totally natural as in the case of climate change. A court could disallow an "Act of God" defense for climate change-exacerbated flood hazards because of the element of human intervention.

--Was the event "unprecedented" or at least very large in magnitude? Some courts have required that a flood event be "unprecedented" to qualify for an Act of God defense. A climate change-related flood event may or may not be unprecedented depending upon the specific facts. However, there would often be some warning based upon climate-related and broader precipitation models and this would undermine the Act of God defense. For example, the Alabama Supreme Court in *Bradford v. Stanley*¹²⁷ observed that: "In its legal sense an "Act of God" applies only to events in nature so extraordinary that the history of climatic variations and other conditions in the particular locality affords no reasonable warning of them."

--Was the event unforeseeable? The foreseeability of natural hazard events has been dramatically increased in the last two decades not only by documentation of past events but through various prediction and modeling techniques. Courts do not require that events be specifically predictable (e.g., date, place) to be "foreseeable". It is enough that the event could

¹²⁵165 N.W.2d 346, 349, 350 (S.D., 1969).

¹²⁶Id. See also 279 N.W.2d 418 (N.D., 1979).

¹²⁷355 So. 2d 328, 330 (Ala., 1978).

have been anticipated in a more general sense. Mounting empirical and modeling evidence makes climate change increasingly “foreseeable”.

--**Was the event the proximate cause of the damage or injury?** Proving that climate change is the proximate cause of flood or erosion damage may be difficult, particularly where flooding is due to some combination of traditional flooding and that which is caused by climate change. The general rule is that when the natural event combines with the acts of the defendant to produce the injury, the defendant is liable if the natural hazard event would not have independently produced the damage without the defendant's acts. See e.g., *Fairbrother v. Wiley's, Inc.*¹²⁸ (Gusty winds were not an “Act of God” and did not relieve defendant of fault for negligence.) In *Mark Downs, Inc. v. McCormick Properties, Inc.*,¹²⁹ the court noted that “An “Act of God” will excuse mortal man from responsibility only if God is the sole cause....Where God and man collaborate in causing flood damage, man must pay at least for his share of the blame.” Where the acts of man and the Acts of God combine to cause damage, courts have generally held man responsible for the total damage. See e.g., *National Weeklies, Inc. v. Jensen*¹³⁰ in which the court stated:

If the damage done was solely the result of an Act of God, the city was not liable. If the negligence of the city proximately contributing and an Act of God combined to produce the result, the city is liable.

¹²⁸331 P.2d 330 (Kan., 1958).

¹²⁹441 A.2d 1119, 1128-29 (Md., 1982).