Ocean & Coastal Management xxx (2017) 1–14

Contents lists available at ScienceDirect

Ocean & Coastal Management

journal homepage: www.elsevier.com/locate/ocecoaman

Why coastal regulations fail

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ARTICLE INFO

Article history:
Received 30 January 2017
Received in revised form
28 April 2017
Accepted 10 May 2017
Available online xxx

Keywords:
Management
Regulations
Coastal zone
Alabama
North Carolina
Mining

ABSTRACT

This perspective examines case examples, primarily from the U. S. Carolinas and Alabama, that illustrate some of the flaws of four federal programs of the last 50 years (National Flood Insurance Program, U. S. Coastal Barrier Resources Act, Coastal Area Management Act, Stafford Disaster Relief Act), as well as general reasons for state and local regulation failures. The latter include: variances that undercut the regulatory intent by the tyranny of small decisions, emergency dispensations, and compensatory mitigation; allowances for 'temporary' shore-hardening structures that become permanent; establishing control lines that are not adjusted to shifting shorelines; over-simplifying (one-size-fits-all) and misapplying (importing inappropriate strategies) regulations; conflicting jurisdictional boundaries; and the political instability of regulatory laws. Political-legislative realm failures include: 1) generalized laws do not match the complexity of coasts; 2) legislators lack the foresight to provide funding for regulatory monitoring/enforcement/penalties; 3) legislative bodies lack continuity of visions or goals for the future (e.g., overturn or weaken prior regulatory legislation); and 4) politicians are subject to conflicts of interest (e.g., affluent coastal land owners; pro-development lobbies). The political-legislative disconnect from the reality of Nature, and failure to use longer-term projections of erosion rates, sediment supply, and effects of sea-level rise, are the most frequent culprits in regulatory failure. New starting points for sound regulatory coastal management are better-informed politicians with the will to enact laws based on science that reflect natural variability, and laws that are unflawed by variances or over simplification. Regulations need to have continuity, proper funding, and enforcement.

Contents

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http://dx.doi.org/10.1016/j.ocecoaman.2017.05.003
0964-5691/

1. Introduction

This paper is a 50-year perspective of the authors, rather than an extensive literature-based report on failed coastal regulations. Our starting point is the 1960s and 1970s, the era of modern coastal regulations, with the dawning of the present realization of overdevelopment in high-hazard zones, and the added impact of the acceleration in sea-level rise. Since that time, the number of published coastal science studies grew rapidly in tandem with increasing regulations at various governmental levels, and during this time two of the authors were active in U.S. coastal studies (e.g. Pilkey et al., 1975, 1978; Pilkey and Neal, 1979–2004). During this time span, coastal science has defined and mapped coastal-hazard zones, generated coastal vulnerability indices (CVIs), and provided data bases and recommendations in support of coastal zone management. At the same time, losses due to coastal hazards have increased, and more population and property are at risk than ever before. Reasons for these increased losses and risks are varied, but the failure of coastal regulations certainly is accountable in a large part. Some of these failures are documented in the academic literature, however, most occur at the local level and get only local media attention. Backroom politics, the dynamics of wealthy stakeholders influence, and midnight calls to the governor's office to get permit-denials overturned, generally go unknown or are not reported in the media.

2. Four major U. S. federal coastal regulatory programs

In the U. S., prior to the 1960s, there was no real framework of federal law for coastal zone management. For example, the U. S. Army Corps of Engineers (USACE) had permitting authority for structures built on, or that would alter, navigable waterways, under the Rivers and Harbors Act of 1899 (including dredge and fill projects such as beach nourishment). Federal and state agencies had authority over public coastal lands such as parks, and fish and game preserves, but there was no federal framework for general coastal zone management. The Federal Water Pollution Control Act of 1948, the precursor of the Clean Water Act of 1972, provided some authority for regulating coastal zone waters, but it was not until after the rapid post-WWII coastal development surge and devastating hurricanes of the 1950s that the U.S. Congress began passing legislation in the realm of coastal zone management.

Four of these programs from the late 1960s through the 1980s, all of which have since been renewed, amended, or modified, are examined in the following sections. The purpose is not to give the scope of their history and breadth, but rather to provide typical short examples of their deficiencies or failures.

2.1. National Flood Insurance Act 1968 and the National Flood Insurance Program (NFIP)

The National Flood Insurance Act of 1968 created the National Flood Insurance Program (NFIP), administered by the Federal Emergency Management Agency (FEMA). Originally aimed at addressing insufficient riverine floodplain management, the program was expanded to cover coastal-hazard zones in 1973 (Flood Disaster Act), and has become the primary provider of flood insurance for much of the coastal zone. Although progressive in improving building standards and requiring communities to pass ordinances restricting further development in flood areas, the NFIP had shortcomings from the beginning (Pilkey et al., 2016). Subsequent Congresses attempted to reform the program (e.g., 1987 Upton-Jones Amendment to provide assistance to move houses out of a hazard zone; this program was terminated by the NFIP Reform Act of 1994; the 2012 Biggert-Waters Act; and the 2014 Homeowners Flood Insurance Affordability Act). None of these changes met with much success (Cleetus, 2016). The National Flood Insurance Program is up for Congressional reauthorization in 2017.

After nearly every hurricane, NFIP's failures are noted in the media (e.g. Lehrer, 2008, 2013; Rao, 2016), organizational reports (e.g. Cleetus, 2013, 2016), academic studies (e.g. Divoky et al., 2012), and political analyses (e.g. King, 2012, 2013). The ink was barely dry on King's June 2012 Congressional Research report when Hurricane Sandy struck, leading him to generate another report (King, 2013).

Decades have gone by, and the NFIP is no more effective than when it began. Almost every report notes that the program actually has encouraged development in hazard areas, is not actuarial, and by the end of 2014 this FEMA program was $23 billion in debt (G.A.O., 2015). In a 2016 interview (Flavelle, 2016) the outgoing Director of FEMA noted that as long as the government (taxpayers) pays the tab for disaster recovery, states and local governments have little incentive to move development out of harm's way. Part of the financial solution is placing the responsibility for clean-up costs on the affected states, rather than on federal agencies. He went on to note that subsidizing risk is social welfare for developers, while the taxpayers are left holding the bag.

One of the best analyses of the NFIP's short comings is that of Bagstad et al. (2007) in a study focused primarily on the U. S. Gulf Coast. They contend that the NFIP is a **perverse subsidy;** a subsidy that is “both economically inefficient and environmentally or socially damaging” (Bagstad et al., 2007, p. 286). They point out that none of the economic assumptions for the NFIP to operate successfully are met, and they also give examples of the economic flaws. Most such analyses seem to make recommendations that fall into the socio-economic realm (Cleetus, 2016; Flavelle, 2016; King, 2012, 2013). However, principles of coastal science should still be the basis for any sound management program, and the NFIP comes up short in that area too.

Floodplain maps, created by the FEMA Flood Map Service Center (MSC), are the basis for establishing the various risk zones on which insurance rates are based. In the coastal zone these include predicted levels of storm-surge flooding and added wave height. These zones are based on records and/or models of *past* events, but the impact of coming storms will depend on a new set of variables (e.g. higher sea level; possible increased storm frequency/intensity; and modifications to coastal morphology that will change surge patterns or floodplains). Mapping should be based on projections of these *future* events, and focus on local processes that will change

Please cite this article in press as: Neal, W.J., et al., Why coastal regulations fail, Ocean & Coastal Management (2017), http://dx.doi.org/10.1016/j.ocecoaman.2017.05.003