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A COMPARATIVE EVALUATION OF THE CLEAN BOHAI SEA PROGRAM AND THE CHESAPEAKE BAY PROGRAM

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ABSTRACT: *This thesis offers a comparative evaluation of two Regional Ocean Governance [ROG] regimes: The Clean Bohai Sea Program [CBSP] in China, and the Chesapeake Bay Program [CBP] in the USA. This study compares and evaluates these two ROG regimes primarily from a governance and management perspective. The willingness to address ecological concerns, from a ROG perspective, is reflected in precisely how much participating jurisdictions are willing to divest themselves of unilateral power in order to cooperate across administrative boundaries. Is this central tenet of ROG actually being attempted by the participants in question? The principle objective of this paper is to evaluate how either regime compares to the theoretical framework of ROG, and whether or not the central concept of trans-jurisdictional integration is actually being attempted. First, this paper builds an analytical framework by offering a review of the basic concepts that define ROG. Secondly, this paper gives an overview of the CBSP and CBP regional ocean governance regimes and the places that define them. Finally, this study compares and contrasts the two ROG regimes in question. This study finds that while both the CBP and CBSP represent genuine attempts at ROG by their respective governments, the CBSP nonetheless deviates substantially from the basic principles of ROG as outlined in the literature. The CBSP's management mechanism does not align with ROG principles and fails to truly instigate trans-jurisdictional integration. Stakeholder engagement is also not integral to the CBSP, and the CBSP's monitoring network does not represent an integrated monitoring network. This study also finds that both programs have failed to achieve stated goals as outlined in program documents for reasons relating to the political economy of either program, and the inability of either program to garner enough political capital to make achieving program goals a reality. This is particularly evident in the case of the CBSP, due to the institutional impediments discussed above, which exacerbates this tendency. This study recommends that both programs adopt more internalized financing regimes, and that the CBSP adopt a more decentralized, integrated and transparent management structure.*

KEYWORDS: Regional Ocean Governance [ROG], Governance, Bohai Sea, Chesapeake Bay, Clean Bohai Sea Program [CBSP], Chesapeake Bay Program [CBP].

INTRODUCTION

Background and Overview

This study offers a comparative evaluation of two Regional Ocean Governance [ROG] regimes: The Clean Bohai Sea Program [CBSP] in China, and the Chesapeake Bay Program

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[CBP] in the USA. This study compares and evaluates these two ROG regimes primarily from a ROG perspective. The willingness to address ecological concerns, from a ROG perspective, is reflected in precisely how much participating jurisdictions are willing to divest themselves of unilateral power in order to cooperate across administrative boundaries. Is this central tenet of ROG actually being adhered to by the participants in question? The principle objective of this paper is to evaluate how either regime compares to the theoretical framework of ROG, and whether or not the central concept of trans-jurisdictional integration is actually being attempted.

The remainder of this paper is divided thusly: Chapter 1 will introduce this study and outline the analytical framework used by this paper in carrying out its comparative evaluation, as well as a review of the key concepts that define Regional Ocean Governance [ROG] and certain related disciplines, such as ICZM. Chapter 2 gives an overview of Bo Hai and its ROG regime, the Clean Bohai Sea Program [CBSP]. Chapter 3 offers an overview of the Chesapeake Bay, and its ROG regime: the Chesapeake Bay Program [CBP]. Chapter 4 contrasts the regimes relative to one another, and towards the basic principles outlined in Chapter 1. Finally, Chapter 5 will offer a conclusion.

This study finds that while both the CBP and CBSP represent genuine attempts at ROG by their respective governments, the CBSP nonetheless deviates substantially from the basic principles of ROG as outlined in the literature. The CBSP's management mechanism, the Joint Conference, does not align with ROG principles and fails to truly coordinate actors working within this system. Stakeholder engagement is not integral to the CBSP, and the CBSP's monitoring network does not represent an integrated monitoring network. This study also finds that both programs have failed to achieve stated goals for reasons of political economy, and the inability of either program to garner enough political capital to make achieving program goals a political reality. This is particularly evident in the case of the CBSP, due to the institutional impediments discussed above, which exacerbates this predicament. This study recommends that both programs adopt more internalized financing regimes, and that the CBSP adopt a more decentralized, integrated and transparent management structure.

Framework of Study

The structure of this study was carried out largely using a review of the current literature relating to ROG, and related disciplines such as EBM and ICZM; as well as literature relating to the two programs in question, particularly primary sources, such as legal instruments and program documents.

Firstly, this paper will build an analytical base by examining and reviewing the theoretical framework of ROG. This paper then contextualizes the study by reviewing the background of either program. The paper then outlines the specific structure and framework of each

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program, with particular emphasis placed upon the managing and coordinating mechanisms of the two regimes, highlighting how (if at all) relevant actors coordinate their efforts. Finally, this paper will evaluate the two programs by comparing them to one another, and highlighting where they align with, or diverge from, one another or the theoretical underpinnings of ROG.

Background and Literature Review

Regional Ocean Governance [ROG] is a nascent discipline within environmental governance that seeks to extend the concepts of EBM to the governance of marine ecosystems. EBM seeks to establish holistic, ecosystem-based governance regimes of ocean and coastal ecosystems which harmonize sectoral interests through the integration of preexisting institutional arrangements and stakeholder interests.

"Governance" is defined as: "all processes of governing, whether undertaken by a government, market or network, whether over a family, tribe, formal or informal organization or territory and whether through laws, norms, power or language" (Bevir, 2013). "Regional Ocean Governance" [ROG], can in turn be defined as: "[T]he architecture and makeup of the regime used to govern behavior, public and private, relative to an ocean area and the resources and activities contained therein" (Cicin-Sain, 1998; Wowk, 2008). Regional Ocean Governance is governance of the marine ecosystem.

Underpinning the concept of ocean governance is ocean management. Governance is distinct from management in that governance implies a radius of control wider than that encompassed by the term management. Nevertheless, the two are interrelated, as governance implies management; and subsequently ROG is interrelated to Ocean and Coastal Management [OCM]. When discussing the nascent discipline of OCM, three interrelated terms dominate the literature: Ecosystem-Based Management [EBM], which refers to any environmental management system that considers the whole ecosystem (and not just one sector thereof) when managing a region; Coastal Zone Management [CZM], which can be understood simply as EBM applied to the coastal zone; and Integrated Coastal Zone Management [ICZM or ICM], which is a distinct school within CZM that advocates an integrated approach to management that attempts to resolve sectoral disputes by integrating stakeholder interests in the outlining management structure of the regime.

A "stakeholder" can be understood as any individual or group that has an interest in the coastal ecosystem, where "interest" is understood in the economic or societal sense of the word (Chua, 2008). A stakeholder could therefore also be defined as any sector of society whose activities impact the marine ecosystem. Stakeholder participation is critical to program success. Stakeholders must be incorporated into a ROG program directly, and integrated into its management structure at all levels if the program is to succeed.

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The structural apparatus of an EBM regime should integrate the preexisting institutional arrangements of participating jurisdictions and line agencies participating in the regime. ROG hinges on a notion of "trans-jurisdictional integration", in which the competency or clemency of the jurisdictions to govern the marine ecosystem in question is given over to a new trans-jurisdictional regime that exercises such on their behalf. However, as the ROG regime is ultimately derived from jurisdictions in question, the regime's authority does not represent a loss of sovereignty on their part, but is ultimately an extension of the jurisdictions and governments that created it, and integral to them.

A successful EBM or ROG regime implies economic self-sufficiency. An EBM program that relies on the assumption of continued external funding is not economical. Funding for the program should be internalized as quickly as possible to make the program financially solvent and economically feasible in the long-term. Examples of such financial mechanisms, including recreational user-fees, licensing fees related to fisheries, dumping or discharge fees, stock or catchment fees, or shipping or mooring fees. Even a well-managed taxation mechanism could also be instituted if it is related to the coastal environment (i.e. Pigovian water pollution tax) (Chua, 2008; Cicin-Sain, 1998; Lee, 2010; Shia, Hutchinson, Yu, & Xu, 2001). Financing from such sources can be fed back into the program and can be used to finance it independently of common government or private funds.

BO HAI

Description

Bo Hai is a semi-enclosed sea, bounded by the Shandong Peninsula to the south, the North China Plain to the west and north, and the Liaodong Peninsula to its east (UNEP, 2005; Zhang, Zhu, Wang, & Wang, 2006). Bo Hai encompasses three bays: Laizhou Bay in its south, Bohai Bay in its west, and Liaodong Bay in its north (State Oceanographic Administration, 2000; UNEP, 2005; Zhang et al., 2006). Bo Hai is the innermost gulf of the Yellow Sea, and is separated from the Yellow Sea to its east by the Bohai strait; only 57 nautical miles across at its narrowest point from Laotieshan to Shandong Peninsula (Peng et al., 2009; State Oceanographic Administration, 2000; UNEP, 2005). Being located in the north temperate zone of China, Bo Hai has an average temperature of 24℃-26℃ in summer, 1℃-2℃ in winter, and 8℃-10℃ overall (State Oceanographic Administration, 2000). Bo Hai's annual precipitation is 300 to 400 m (State Oceanographic Administration, 2000). Bo Hai has an average depth of 18 m and an average salinity of 30% (State Oceanographic Administration, 2000).

Legislative Background

- August 24, 1998: Zhang Peiyang and the SCNPC investigate Bo Hai.

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- July 25, 2000: BDEP (渤海环境保护宣言) signed in Dalian, China, by the jurisdictions, MEP/SEPA, and SOA, as well as some other participants, such as PEMSEA.
- In tandem with the BDEP, SOA also drafts "Bohai Sea Sustainable Development Strategy" [BS-SDS] 《渤海可持续》
- May of 2000: ADB, MoA, SOA, and Mini-Com establish "The Bohai Sea Coastal Resources Management Action Plan" (渤海沿海资源管理行动计划).
- August 2000: SC approved the "The Bohai Sea Comprehensive Restoration Plan for 2001~2015" (渤海综合整治规划 2001~2015) as formulated by the SOA.
- August 8, 2001: SOA submitted to SPDC the 'The Bohai Sea Comprehensive Restoration Plan 15' BSCRP15 (渤海综合政治"十五")
- 2001: BBSAP 《渤海碧海行动计划》 published, CBSP launched.
- June 2006: BBSAP canceled following disappointing results in Phase I, reform of CBSP begins.
- August of 2007, the OMPBS《渤海环境保护总体规划 2008——2020 年》is drafted by NDRC.

Management Mechanism

The management structure of the CBSP is given by Peng et al. (2009) on Figure 2-1 below. The CBSP hinges around an "Environmental Objective Responsibility System" [EORS], in which line agencies limit their participation to supervision in particular duty areas, as give on Figure 2-1, while jurisdictions implement CBSP policies within their own administrative boundaries. (Ministry of Environmental Protection, 2001a, 2001b). The three provinces tend to delegate mandates further down to local government entities (especially the 12 littoral cities), implementing legislation to ensure compliance from them. The PLA Navy is loosely involved in the program by monitoring pollution discharges from naval vessels.

All jurisdictions and line agencies are to coordinate their efforts through the "Joint Conference" 《联席会议》, a meeting between participating governing entities. Under the original BBSAP, this body was under the aegis of MEP/SEPA, but following the OMPBS is now under the NDRC (Ministry of Environmental Protection, 2001a, 2001b).

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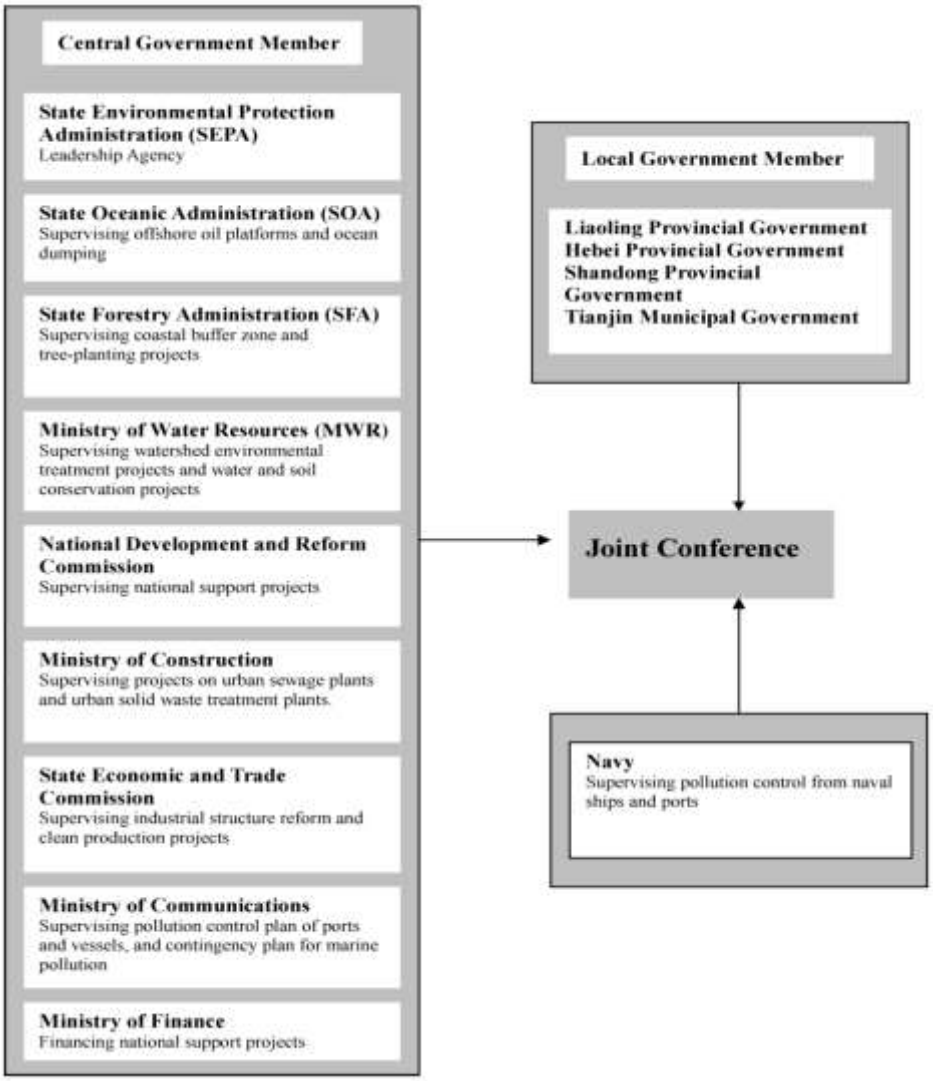

FIGURE Error! No text of specified style in document.**-1: STRUCTURE OF THE CBSP JOINT CONFERENCE UNDER THE BBSAP, INCLUDING MANDATES FOR PARTICIPATING GOVERNMENT ENTITIES**

Source: Image adapted from (Ministry of Environmental Protection, 2001b; Peng, Jin, & Burroughs, 2009).

Management Area

The CBSP manages the "Bohai Sea", which for the purposes of the program includes Bo Hai proper, the four province-level jurisdictions encircling it and the adjoining watersheds encompassed by them, and a small segment of the abutting Yellow Sea (Ministry of Environmental Protection, 2001a, 2001b). The original CBSP divided Bo Hai into four "control belts" 《控制带》, or "circles" 《圈》 which were further subdivided into regions called "control zones" 《控制区》. "Control units" 《控制单元》 are discrete program

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entities that carry out specific functions within each control zone; and control zones can be further sub-divided into smaller "control sections" 《控制断面》(Ministry of Environmental Protection, 2001b).

TABLE Error! No text of specified style in document.**-1: BOHAI CONTROL BELTS**

Control Belt:	English Name:	Chinese Name:	Area:	Control Zones (控制区):	Control Units (控制单元):	Control Sections (控制断面):
Belt 1	Upstream Watershed Control Belt	上游流域控制带	Bo Hai watershed, excluding the Liaodong Peninsula.	6	22	30
Belt 2	Coastal Land Control Belt	沿海陆域控制带	Thirteen littoral cities (and sewage discharge areas)	13	74	74
Belt 3	Near Shore Waters Control Belt	近岸海域控制带	Three bays, and coastal waters.	5	47	47
Belt 4	Central Bohai Sea Control Belt	渤海中部海域	The middle basin of Bo Hai and portions of the abutting Yellow Sea	1	1	1

Source: Adapted from Ministry of Environmental Protection (2001b)

Monitoring

TABLE Error! No text of specified style in document.**-2: ENVIRONMENTAL MONITORING STATIONS IN THE WBHSA**

Station	SEPA		SOA		MoA		Total	
	Number	%	Number	%	Number	%	Number	%
Near-shore (depth < 5m)	70	50	5	24	29	53	104	48
Near-shore (depth > 5m)	49	35	7	35	18	33	74	34
Offshore (distance > 6 km)	21	15	8	40	8	15	37	17
Total	140	100	20	100	55	100	215	100

Source: Adapted from (Peng et al., 2009; Zhang et al., 2006)

In 1978, three Chinese ministries, SOA, MEP/SEPA, and MoA, began the Environment Monitoring Network in Bohai Sea and Yellow Sea (Zhang et al., 2006). In 1984, this local

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monitoring network was incorporated into the nation-wide National Marine Environment Monitoring Network.

In 1997, these three ministries dissolved their mutual efforts. MEP/SEPA seceded and began its own network, the National Offshore Marine Environment Monitoring Network. MoA similarly began its own private monitoring system (Zhang et al., 2006). Of the 215 monitoring stations in Bo Hai, 140 belong to MEP/SEPA, 55 to MoA, and 20 to SOA, respectively (Zhang, Zhu et al. 2006). Table 2-2 above summarizes this information.

In 2006, the environmental monitoring system of Bo Hai was restructured again. The Environment Trend Monitoring system would monitor overall changes in chemical and ecological trends as they develop. The Intensive Monitoring of Specific Important Areas system would have a narrower scope, "focusing on the changes of seriously polluted, ecologically-important and sensitive areas" (Zhang et al., 2006).

Goals and Objectives

CBSP/BBSAP Goals and Objectives

The BBSAP was divided into three distinct five-year phases, aligning roughly with the five-year plan [FYP] system (Ministry of Environmental Protection, 2001b). The three phases of the CBSP were:

- Phase I ("The Near-term Phase", 《近期》), from 2001~2005;
- Phase II ("The Mid-term Phase", 《中期》), from 2006~2010; and
- Phase III ("The Long-term Phase", 《远期》), from 2011~2015.

The objectives, specific targets, measures, and the amount invested (in billions of RMB) for each phase are given on Tables 2-3.

CBSP/OMPBS goals and objectives

Following the cancellation of the BBSAP, the CBSP was restructured under the OMPBS. The OMPBS outlines two management phases for the CBSP, these are:

- Phase I ("The Near-term Management Phase", 《近期》), 2008～2012; and
- Phase II ("The Long-term Management Phase, 《远期》), 2013～2020

The objectives, specific targets, measures, and investments (in billions of RMB) for each phase are outlined on Table 2-4 below.

Print ISSN: ISSN 2397-7507, Online ISSN: ISSN 2397-776

TABLE Error! No text of specified style in document.**-3: OBJECTIVE AND SPECIFIC TARGETS OF CBSP (UNDER THE BBSAP)**

Phase	Objectives	Specific Targets	Measures	Investment (Bil/¥)
Phase I (2001~2005)	●To Control Marine Pollution	● To control point source pollution	● Constructing urban sewage and solid waste treatment facilities	● Pollution control (14.68)
	● To halt ecosystem degradation	● Cut terrestrial COD, N, P, and oil by 10%, 20%, and 20% from 2000 levels.	● banning sale/use of phosphate products	● Eco-restoration (11.66)
		● To restore damaged ecosystems	● Reducing pesticide and fertilizer uses	● Improvements in production technologies (6.38)
			● Establishing eco-agricultural demonstration sites	● Management support (0.32)
Phase II (2006~2010)	● To achieve initial improvement in marine environmental quality	● To control non-point source pollution	● Initiating integrated management of small watersheds.	● Pollution control (6.82)
	● To control the destruction of Marine ecosystems	● Cut terrestrial COD, N, P, and oil by 10%, 15% and 20% from 2005 levels.	● Constructing coastal ecological buffers	● Ecosystem restoration (9.10)
		● To restore damaged ecosystems	● Treating & recycling waste from invasive stocks.	● Improve production technology
		● To achieve environmental targets specified in the coastal ocean zoning plan		● Management support (0.29)

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Phase III (2011~2015)	● Achieve significant improvement in environmental quality ● Restore basic marine ecosystem functions	● To achieve environmental targets outlined in the Coastal Zoning Plan ● Establish MPAs Source: Adapted from (Peng et al., 2009)	● Constructing treatment facilities vessel wastes ● emergency systems for mobile oil spill pollution ● Non-discharge areas to protect commercial and endangered species habitats ● Initiating a seasonal closure regime ● Developing eco-friendly mariculture ● Restoring marine plants ● Restoring key ecosystems	N/A

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TABLE Error! No text of specified style in document.**-4: OBJECTIVES AND SPECIFIC TARGETS OF CBSP (UNDER THE OMPBS)**

Phase	Objectives	Specific Targets	Measures	Investments (¥/Bil)
Phase I ((2008-2012)	● Establish effective control over pollution from the 13 littoral cities by constructing drainage basin pollution control system. ● Reduce risk of oil spills. ● Lower occurrence of Red Tide. ●Establish a unified coordinating mechanism and pollution control system across Bo Hai. ● Establish effective control of shipping and port pollution, further strengthen regulations on oil platforms and marine dumping. ● Begin preliminary relief efforts to reduce the environmental degradation of fisheries. ● Establish effective	● Realize a wastewater and sewage treatment rate of no less than 80% for urban areas, 60% for county areas. ● Achieve an urban sewage treatment plant operational load rate of at least 75%, and garbage disposal rate of at least 90%. ● Achieve an industrial pollution stabilization rate of 90%. ● Achieve agricultural non-point source pollution control area of 9.6 million mu. ● Restore 9.6 million ha of wetlands. Increase protected forest area to 460,000 ha. ● Reduce oceanic COD	● Build 9,687,000 mu of agricultural non-point source pollution control areas; 828 clean farming areas, and 3,430 clean model villages with sewage and trash treatment at 80%. ● Enhance sewage treatment: 8,464,000 tons / day; trash treatment: 14,720 tons / day; wastewater treatment 1.34 million tons / day ● Build shipping and port monitoring, emergency prevention and response, management systems. ● Build 29 new MPAs, dumping area planning, dredged material disposal technologies; fishery stock enhancement, artificial reefs, and ecological farming demo sites, ● 21 million ha of wetlands: restore 67,000 ha, retire 21,000 ha; 48,000 ha of pollution controlled area; replanting of 35,000 ha of sea and beach grasses; remove 40,000 ha of invasive species ● Plant coastal barrier forests (135,000 ha.), depth shelter forests (117,000 ha), and coastal erosion and wave dissipation forests (40,000) totaling 292,000 ha. ● Enhancement of 1,504	● agricultural non-point source pollution prevention and control (4.17) ● Urban wastewater and recycle treatment projects [223 discrete program items] (16.44) ● Urban garbage treatment projects [48 discrete program items] (2.69) ●Industrial pollution Standards [165 discrete program items] (5.37) ● Port & Shipping Pollution Control Projects [32 discrete program items] (1.537) ● Capacity building for protected areas & environmental monitoring [29 discrete program items] (1.25) ● Aquatic ecological restoration and management projects [92 discrete program items] (3.07) ● Wetland protection and recovery [212,226 Has] (1.9) ● Military related environmental projects [1,504 discrete program items] (1.75) ● Marine Environmental Monitoring System [114

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	monitoring of ecological areas, MPAs, MFZs, and disaster-prone areas; establish a monitoring system for fisheries; and seawater discharge ● Throughout all aspects and activities of the program, enable trans-jurisdictional, cooperation.	by 1.2 million tons. Reduce total N to 125,000 tons, and runoff to 1.22 billion cubic meters. ● Achieve a compliance rate of over 85% with important marine function zones.	coastal military garrisons. ● Build environmental monitoring and emergency-and-early-warning systems. ● Various capacity building and technological development research programs.	discrete program items] (5.64) ● Science and Technology Support Systems Projects (1.8) ● Total Investment (45.62)
Phase II (2013-2020)	● Form a comprehensive coastal and ocean environmental management system that covers all aspects of the coast, from the upstream watershed to the littoral zone and ocean basin, which incorporates a thoroughly integrated management and decision-making system to control marine pollution and restore the environment, to comprehensively treat land-based source pollution, to renovate and	● Full control of agricultural nonpoint source pollution, effective control of industrial point source pollution, full effective treatment of all urban sewage and garbage, full realization of water conservation throughout river basin ● Achieve a compliance rate of over 90% with important marine function zones. ● Develop and	● Implementation of ecological restoration and environmental improvement projects for the three major river basins. ● Bohai Sea environmental damage and degradation mitigation program: wetland restoration, kelp cultivation, restoration of coastal ecosystems, protect biodiversity, invasive species prevention. ● Enlarge and improve upon shipping and port pollution control mechanisms ● Enlarge barrier forests, depth shelter forests, and wave dissipation (purification) forests by 64,000 ha, 96,000 ha, 50,000ha respectively. ● Full control of agricultural nonpoint source pollution. Construction of 3400 mu of	● Riverine Ecological Restoration and Environmental Management Program (57.74) ● Bohai Sea Ecological and Environmental Restoration Program (2.5) ● Shipping and Port Pollution Prevention program (0.811) ● Agricultural Non-point Source Pollution Control program (~20.0) ● Total Investment (81.05)

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comprehensively treat the aquatic environment and aquatic resources, to foster environmental technology support, and to monitor these five systems in order to establish a positive environmental cycle that sees humans and the ocean living in harmony.	implement a Total Amount Control scheme, reduce pollutants and COD entering the sea by 800,000 tons, increase the amount of water flowing into the sea by 4 billion cubic meters ● Achieve inter-sectoral, inter-regional, inter-basin pollution control and ecological protection, and effective integration of information sharing.	clean planting areas, 2300 clean farming areas and 8500 clean model villages.

Source: Adapted from (国务院, 2009)

Financing

Funding for the CBSP is highly centralized. All funding is managed by the central government, which disperses program funds through local city governments, local People's Procuratorates, or other relevant channels (Ministry of Environmental Protection, 2001b; 国务院, 2009).

Under the BBSAP, there were approximately 427 particular projects to be implemented during the first two phases from 2001 to 2010, with a total investment of ¥55.5 billion. Approximately 59.54% of this investment, or ¥33.05 billion, went to the more than 286

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projects incorporated as part of Phase I from 2001~2005. Phase III saw no investment, as the BBSAP was cancelled before implementation had reached that point. This information is summarized on Tables 2-3 and 2-5 (Ministry of Environmental Protection, 2001b).

Under the new OMPBS, the government of the PRC appropriated ¥126.67 billion towards the project. Of this, ¥45.62 billion (36.01%) was appropriated for Phase I, and ¥81.05 billion (or 63.98%) was appropriated for Phase II. This information is summarized on Table 2-4 (国务院, 2009).

Results

CBSP/BBSAP Results

The results of the CBSP under the BBSAP are paraphrased on Table 2-5 below:

TABLE Error! No text of specified style in document.**-5: PERFORMANCE OF CBSP**

	Assessment	Remark
Environmental Indicators		
Water Quality Improvement	?	SEPA: Improved SOA: Continues to deteriorate
Total Emission Quantity Control	+	Controls of P, COD, and Oil achieved expected objectives; N achieved 88.4% of planned target.
Ecosystem Conditions	→	Improvements in some areas; unhealthy or sub-healthy conditions remain overall
Behavioral Indicators		
Coordination Mechanism	—	The joint conference regime is not functioning well.
Incentives	→	Environmental Objective responsibility system is partly effective.
Change in government behavior	→	Environmental Objectives are secondary to economic growth
Behavioral changes among individuals and producers	→	Limited Positive Changes
Investments		
● Urban Sewage treatment plants	→	60% of planned investment
● Solid waste treatment plants	→	63% of planned investment
● eco-agriculture and eco-fisheries	→	72% of planned investment
● vessel pollution controls and marine pollution	→	76% of planned investment

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contingency plan
- ecosystem monitoring → No Data
- Habitat protection and restoration → No Data

The results of the BBSAP have been ambiguous, with different observers at times offering conflicting reports. For instance, following the completion of Phase I, SOA and MEP/SEPA actually proffered conflicting reports. Peng et. al. (2009) suggests that this discrepancy is likely due to a confluence of several different factors, and not necessarily due to intentional falsification. Nevertheless, that such a wide discrepancy as this can exist between these reports highlights the chronic lack of communication and integration within the CBSP.

What impact, if any, the CBSP has thus far had upon Bo Hai is difficult to gauge. What can be stated empirically is that the health of Bo Hai continues to decline.

CBSP/OMPBS Results

The results of Phase I of the OMPBS are forthcoming

CHESAPEAKE BAY

Description

The Chesapeake Bay is an inland bay of the Atlantic Ocean in North America, extending more than 200 miles from Virginia Beach, Virginia to Havre de Grace, Maryland; and is about 30 miles across at its widest pass near Cape Charles, Virginia. The Chesapeake Bay is technically a submerged ancient river, representing the now flooded ancient Susquehanna River valley from the end of the last ice age. The average depth of the Chesapeake Bay is approximately 21', with many shallow regions less than 4' deep and some wide troughs as much as 174' deep. The surface area of the Chesapeake Bay (including its tidal tributaries) is about 4,480 square miles, and its coastline is 11,684 miles in length. The Chesapeake Bay contains about 18 trillion gallons of water, about half of which is contributed by the Atlantic Ocean. (The Chesapeake Bay Program, 2014d). The Chesapeake Bay watershed extends over 64,000 square miles. More than 17,000 small rivers, creeks, and streams flow into the bay. The Chesapeake Bay watershed has a population of about 17 million, with an average of about 150,000 people migrating to the region every year. More than 8 million acres of land in the Chesapeake Bay watershed are permanently protected from development. Approximately 18,000 local government entities, such as counties, towns, and townships are also located in the wider watershed area. The bay is also home to nearly 80,000 acres of bay or sea grasses and 58% of the watershed is covered by forest (The Chesapeake Bay Program, 2014d).

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Legislative Background

- 1976: Charles "Mac" Mathias (R-Md.) $27 million, five-year study of the Bay
- 1980: State legislatures of Maryland and Virginia form Chesapeake Bay Commission [CBC], integrated legislature for the Bay
- December 9, 1983: the riparian jurisdictions and the EPA signed the 1983 Agreement.
- 1985: Pennsylvania joins CBC.
- December 15, 1987: Signatories of the first agreement sign the 1987 Chesapeake Bay Agreement.
- 1992: Chesapeake Bay Agreement: 1992 Amendments.
- June 28, 2000: the Chesapeake 2000 Agreement was signed. Guided reconstruction of Bays. Adds headwater states to program.
- May 12, 2009: Executive Order 13508, 2-year milestone declaration.
- September 9, 2009: The Next Generation of Tools and Actions to Restore Water Quality in the Chesapeake Bay: A Draft Report Fulfilling Section 202 (a) of Executive Order 13508 by the EPA and the FLC
- Other Important Instruments: Clean Water Act [CWA], (especially Section 117, 303(d)), EO 13366.

Management Mechanism

The structure of the CBP's management mechanism is given on Figure 3-1 below. The Chesapeake Executive Council [CEC] is the executive, policy setting organ of the CBP composed of the Chief Executives (i.e. governors, mayors or administrators) of the participating jurisdictions and line agencies, and the chairperson of the Chesapeake Bay Commission [CBC]. The CEC meets annually, and when not in session is assisted by its Principal Staff Committee [PSC], composed of various department heads taken from subordinate organizations to members of the CEC. Three advisory committees serve to fulfill the function of providing an integrated forum to provide stakeholder input to the CEC/PSC, each representing the interests of different stakeholder groups, namely private citizens, local governments, and the at-large scientific community. The independent evaluator is a task force assembled by the National Academy of Sciences at the request of the CBP to audit and evaluate the program when called upon.

The various Goal Implementation Teams [GITs] are the "eyes, ears, and hands" of the CBP, which actually carry out CBP policies. Each GIT is composed of several "Implementation Workgroups and Taskgroups", which are technical bodies that carry out discrete objectives of the GIT. The GITs coordinate with the Management Board [MB], and with each other, through the Communications Workgroup [CW], an integrated forum wherein GIT members,

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MB members, and other relevant officers meet and interact in order to implement or adapt program policy (EPA, 1983, 1987, 2000; The Chesapeake Bay Program, 2014d).

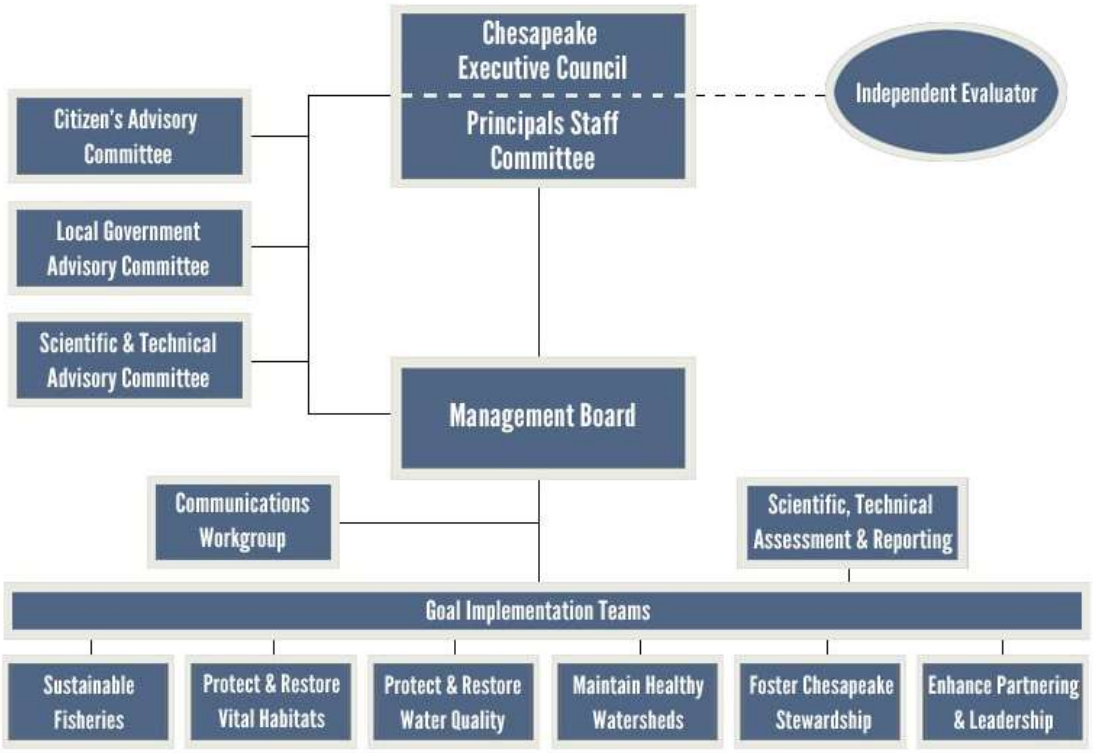

FIGURE **Error! No text of specified style in document.**-2: CBP MANAGEMENT MECHANISM
Source: Adapted from The Chesapeake Bay Program (2014c)

Not pictured on the diagram above are three other entities that participate in the CBP, but which are not themselves discrete organs of the program it's self. These three are the Chesapeake Bay Commission [CBC], an integrated body of legislators from the state legislatures of the participating jurisdictions; the Federal Leadership Committee [FLC], an integrated body of Federal Agencies that provide federal leaderships to the CBP; as well as the Chesapeake Research Consortium [CRC], an NGO that represents the academic community in the Chesapeake bay and participates in the CBP through STAC.

Management Area

The CBP divides the Chesapeake Bay into 92 "segments", pursuant to CWA §303d/305b. CBP segments further form part of larger "segmentsheds" (a portmanteau of "segment" and "watershed"), which are the drainage basins of the associated with the segments. A segmentshed is defined as "…a discrete land area that drains into one of the 92 segments that have TMDLs associated with it" (The Chesapeake Bay Program, 2014c; Weinberg, 2011).

Print ISSN: ISSN 2397-7507, Online ISSN: ISSN 2397-776

Monitoring

The monitoring system of the CBP is called the Bay and Basin Monitoring Program [BBMP], and was instituted in 1984 (The Chesapeake Bay Program, 2014b). The BBMP maintains two monitoring networks.

The Chesapeake Bay non-tidal monitoring network monitors N, P, and suspended sediments, as well as stream flow, from throughout the freshwater river and stream systems of the watershed. This monitoring network is divided into three main types: secondary sites, primary sites, and river input sites, with a total of 88 freshwater river and stream sites throughout the watershed.

The Tidal Monitoring Network deploys approximately 150 sites throughout the Bay's tidal tributaries. These stations are spaced evenly throughout the 92 segments of the CBP, and carry out approximately 14 biweekly or monthly monitoring cruises annually (The Chesapeake Bay Program, 2014b).

The BBMP maintains an integrated GIS database accessible to the public, the Chesapeake Information Management System [CIMS], which makes use of a number of websites, such as the Chesapeake Information Management System Bay Resource Library (http://www.chesapeakebay.net/data), the US EPA's STORET data warehouse (www.epa.gov/storet/dbtop.html), ChesapeakeSTAT (http://stat.chesapeakebay.net), and the Website of the Chesapeake Bay Program (www.chesapeakebay.net) . The inclusion of an integrated information system aligns with ICZM principles as espoused by Cicin-sain (1998) and Chua (2008).

Goals and Objectives

Since its inception in 1983, the goals and objectives of the CBP have evolved substantially. Historically, the goals and objectives of the CBP were set by the Chesapeake Bay Agreements of 1983, 1987, the 1992 Amendments, and the Chesapeake 2000 Agreement. The original 1983 agreement was an organic act that established the CBP, but did not include a discrete list of goals or objectives; subsequent agreements did include substantive lists of objectives. Perhaps the most enduring features of these older agreements was the categorization of CBP goals into topical groups, from whence the nomenclature for the GITs.

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TABLE Error! No text of specified style in document.**-6: MILESTONE COMMITMENTS FOR PARTICIPATING JURISDICTIONS AND THE EPA**

Participant	N (lbs.)	P (lbs.)	Sed (lbs.)
DW	- 48,149	- 42,702	- 18,731,484
DC	- 394,069	- 9,130	+ 1,256,863
EPA*	3,400,000	N/A	N/A
MD	790,549	161,611	904,079
NY**	433,730	51,988	16,397,577
PA	6,328,907	254,377	204,112,700
VA	5,714,226	623,424	117,460,819
WV	58,613	69,782	125,733,105

*In addition to ensuring compliance, the EPA also participates directly by combating N from atmospheric deposition. During the 2012~2013 Milestone, the EPA was to reduce N deposition to tidal bay waters by 2.5 mil lbs. and to the watershed by 0.9 mil lbs.
** New York's 2012-2013 milestone commitments are adjusted to reflect the legally authorized discharge versus the actual discharge (actual discharges are invariably less than authorized discharges).
Source: Taken from the Chesapeake Bay 2012~2013 Milestones Fact Sheet

With the expiration of the Chesapeake 2000 agreement in 2010, CBP goals and objectives are currently determined by the tripartite Bay TMDL regime established in 2009 by the CBC 2-year Milestone declaration, EO13508, and the FLC report, The Next Generation of Tools and Actions to Restore Water Quality in the Chesapeake Bay: A Draft Report Fulfilling Section 202 (a) of Executive Order 13508. Under this regime, all restoration measures required for a restored bay are to be put in place by 2025, with 2017 set as benchmark interim period where approximately 60% of targets are to be met. Participating jurisdictions are to outline pathways for meeting these goals through documents known as Watershed Implementation Plans [WIPs], which are to be submitted to the EPA for approval and monitoring. The EPA and CBP then employ the targets and goals as outlined in the WIPs to monitor, assess, and evaluate bay health and progress along a 2-year milestone system (Early, 2009a, 2009b). The goals and objectives of the most recent 2-year milestone are given on Table 3-1.

Print ISSN: ISSN 2397-7507, Online ISSN: ISSN 2397-776

Financing

TABLE Error! No text of specified style in document.**-7: GOVERNMENT FINANCING OF CBP, 2007~2010**

Gov Entity	2007	2008	2009	2010	Total
Federal	$263,322,496.00	$307,584,979.00	$310,294,573.00	$161,470,363.00	$1,042,672,411.00
MD	$241,039,190.00	$193,310,640.00	$300,295,095.00	$256,685,909.00	$991,330,834.00
VA	$546,615,037.00	$ 38,767,607.00	$36,470,690.00	$367,190,182.00	$989,043,516.00
PA	$157,780,162.00	$131,823,187.00	$267,161,353.00	$168,866,109.00	$ 725,630,811.00
NY	$3,382,418.00	$4,654,316.00	$6,163,435.00	$1,920,000.00	$16,120,169.00
DW	$3,087,648.00	$4,119,774.00	$2,151,112.00	$2,028,386.00	$11,386,920.00
WV	$601,190.00	$310,000.00	$581,000.00	$851,550.00	$2,343,740.00
DC	$2,206,004.00	$2,856,882.00	$6,000,002.00	$ -	$11,062,888.00
CBC	$ -	$1,105,000.00	$1,115,000.00	$1,111,480.00	$3,331,480.00
Lesser Contributor*	$9,277,260.00	$13,045,972.00	$16,010,549.00	$5,911,416.00	$44,245,197.00
Total State	$954,711,649.00	$376,947,406.00	$619,937,687.00	$798,653,616.00	$2,750,250,358.00
Total Gov	$1,218,034,145.00	$684,532,385.00	$930,232,260.00	$960,123,979.00	$3,792,922,769.00

* NY, DW, WV, DC, and the CBC taken together.

With more than 30 years of operation, funding for the CBP has historically been problematic. This study will resign itself to analyzing a sample of Chesapeake Bay funding, from the years 2007~2010. These years were chosen because financing data for these years were most readily available from program sources. This data was analyzed, and then compared to historical evaluations of CBP funding elsewhere in the literature. Tables 3-2 and 3-3 give government funding for the CBP during this time, and concomitant investment into the GITs.

Funding for the CBP has historically been problematic. While there has been no shortage of Federal, State, Local and private contributions, the ability to raise the funds necessary to meet CBP goals remains elusive. Emst (2003) notes that historically, the externalized nature of CBP funding has created a sort of "Tragedy of the Commons", in which actors are incentivized to expand personal gain at the expense of the whole. The ability of the CBP to garner the political will necessary to make achieving program goals a reality has been hampered by this predicament.

The 2007~2010 sample given on Table 3-2 seems to indicate that the situation continues. While a steady stream of funding from state and federal sources remains, these funds fluctuate dramatically. Private sector funding, while reflecting the will of the local residents, is not substantive enough to act as an alternative means of funding apart from government

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sources. These trends generally reflect a lack of political will towards bay restoration and monitoring (The Chesapeake Bay Program, 2014c).

Allocation of funding towards CBP GITs would appear to be somewhat consistent; funds towards GITs has fluctuated but remained steady throughout the period analyzed.

TABLE Error! No text of specified style in document.**-8: INVESTMENTS BY GIT, 2007~2010**

GIT	2007	2008	2009	2010	Total	%:
GIT 1	$27,387,799.00	$19,581,819.00	$12,500,342.00	$16,334,463.00	$75,804,423.00	1.99%
GIT 2	$50,650,979.00	$52,850,708.00	$43,947,004.00	$22,982,332.00	$170,431,023.00	4.47%
GIT 3	$976,267,052.00	$416,893,510.00	$669,558,353.00	$761,897,418.00	$2,824,616,333.00	74.08%
GIT 4	$127,216,378.00	$146,811,497.00	$160,147,046.00	$118,669,159.00	$552,844,080.00	14.50%
GIT 5	$18,779,988.00	$26,023,677.00	$20,110,254.00	$13,577,968.00	$78,491,887.00	2.06%
GIT 6	$22,674,052.00	$26,763,521.00	$29,832,757.00	$31,397,639.00	$110,667,969.00	2.90%
Total	$1,222,976,248.00	$688,924,732.00	$936,095,756.00	$964,858,979.00	$3,812,855,715.00	100.00%

Results

Results have been mixed or disappointing for the CBP. In 30 years of operation, the CBP has had a hand in lessening degradation, but has never been able to abate it. Consensus indicates that the Chesapeake would be worse without the CBP, but that ultimately, the CBP has failed and continues to fail, in meeting its mandate for total restoration of the bay. Table 3-4 offers an overview of program results.

TABLE Error! No text of specified style in document.**-9: PERFORMANCE OF CBP**

	Assessment	Remark
Environmental Indicators		
Water Quality Improvement	—	Only 29.03% of Chesapeake waters meet standards for DO, water clarity, and chlorophyll a. Only 43% of streams and other tributaries rate fair, good, or excellent compared to 57% rating poor or very poor.
Total Emission Quantity Control	+	Emissions of N, P, and Sed into the Chesapeake Bay have fallen to 70.95%, 67.08%, and 81.48% of 1985 levels.
Toxic Substances	—	73.9% of the Chesapeake watershed was subject to chemical contamination as of 2012, this is up from 66.3% in 2006
Ecosystem Conditions	—	Overall decline in health, general degradation of ecosystem health.
Fisheries	→	Tend to fluctuate widely. As yet no success in

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		maintaining long-term sustainability.
Behavioral Indicators		
Coordination Mechanism	—	Coordinating mechanism highly functional. New FLC and EO 13508 further enhance transparency.
Incentives	→	Chesapeake 1987 and 2000 had weak incentives. New 2-year milestone system and WIPs are creating many new incentives.
Change in government behavior	→	Environmental Objectives are secondary to economic growth
Behavioral changes among individuals and producers	→	Limited Positive Changes
Investments		
● Protect and Restore Fisheries	→	1.99% of total investment.*
● Protect and restore Vital Aquatic Habitats	→	4.47% of total investment.*
● Protect and restore water quality	→	74.08% of total investment.*
● Maintain healthy watersheds	→	14.50% of total investment.*
● Foster Chesapeake Stewardship	→	2.06% of total investment.*
● Enhance Partnering & Leadership Management.	→	2.90% of total investment.*

* based on 2007~2010 figures.

Source: Compiled from ChesapeakeSTAT (http://stat.chesapeakebay.net)

Evaluation and Comparison

TABLE Error! No text of specified style in document.**-10: EVALUATION AND COMPARISON**

Key Concept:	CBSP:	CBP:	Comparison:
● Management Mechanism:	✗	✓	CBSP's management mechanism does not seem to align with ROG. CBP has a strong, well developed trans-jurisdictional, integrated and multi-sectoral management regime aligning with ROG.
●Stakeholder Participation:	✗	✓	Stakeholder participation is thoroughly integral of the CBP. CBSP does not incorporate stakeholder participation beyond governmental entities.

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● Coordination and Information Exchange:	✗	✓	The CBP's policies regarding information coordination, dissemination, and exchange align with ROG. Information exchange in the CBSP deviates markedly from ROG; possessing a number of oversights that actually present obstacles to successful information exchange.
● Goals & Objectives:	✓	✓	CBSP goals and objectives highly centralized in the form of policy-setting instruments (i.e. the BBSAP or the OMPBS). Goals and objectives are also very robust. CBP highly adaptable and have evolved greatly over the more than 30 years of operation of the CBP.
● Management Areas:	✗	✓	The CBP's segmentation of management areas aligns with ROG principles. CBSP's management areas seem to align with ROG principles in that they align with ecosystem boundaries to an extent; however, management areas seem to be drawn such as to reinforce municipal boundaries into the program, which reinforces EORS.
● Monitoring and Data Exchange:	✗	✓	The CBSP's monitoring network fragmented; actors do not possess a discrete coordinating mechanism, and even have a history of publishing conflicting information. CBP's network highly systemized; employs integrated GIS databases. Monitoring stations situated ideally to monitor specific changes in Chesapeake
● Financing:	✗	✗	Neither aligns with ROG in terms of financing. Funding is externalized, with CBP relying on state governments and CBSP on central government. However, CBSP financing highly consistent.
Results:	✗	✗	Both regimes have failed to live up to the totality of stated goals. Bo Hai continues to deteriorate rapidly. CBP has produced some real outputs, and is integral to Bay health; nevertheless, program results ultimately mixed.

CONCLUSION

Overall, the CBSP is far too centralized, possesses a vaguely defined management structure, and is opaque with regards private stakeholders. This study recommends that the CBSP decentralize the program apparatus, thereby aligning it more closely with concepts of place-based management, by 1.) incorporating local government entities into the Joint Conference, and 2.) widening stakeholder participation in general, vis-à-vis avenues to allow public input into the program. This study also recommends integrating the monitoring systems of the several participating ministries and jurisdictions, aligning with EBM principles. This will increase information sharing. This study further recommends widening jurisdictional and ministerial mandates, and creating subsidiary organs of the CBSP that are discrete from, but nonetheless integral of, the institutional arrangements of the jurisdictions and line agencies participating in the CBSP.

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Finally, results have been mixed for both programs. In its more than thirty years of activity, the CBP has produced some real outputs. Nevertheless, in most other regards, the impact of the CBP upon bay health is less than ideal. Meanwhile, the CBSP has also seen disappointing results. While some success was seen following the completion of Phase I of the BBSAP, mostly the CBSP saw continued degradation of fisheries resources, many projects left unfulfilled or incomplete, and a general worsening of the ecosystem around Bo Hai.

The tendency to put economic goals before environmental ones is a trend that both the American CBP and the Chinese CBSP share. For both the CBP and the CBSP, funding remains difficult due primarily to its externalized nature. This thesis recommends that both programs devise regimes to internalize funding as much as possible, such as through user fees, emission or effluent taxes or fines, or other mechanisms as appropriate. These mechanisms alone may not be able to supply adequate funding for the program in its entirety, but will nonetheless lessen the reliance on externalized funding. This in turn will lessen the reliance on garnering political will towards program completion at the expense of economic concerns. In this way, program goals will become easier to achieve.

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