

## Geological Afterlives of Sand in the Taiwan Strait

Chencong Zhu  
*Cornell University*

**ABSTRACT:** This essay foregrounds the processes and ramifications of sand's extraction, displacement, and reassembly as critical material and political junctures to unfold the cross-strait geo-political impasse between the "two Chinas." These processes, termed "geological afterlives of sand," brought the gulf of waters between Xiamen and Kinmen to the fore. In this fluid space where border is ideologically fraught, sand has become a critical bordering entity that enables the encounter between geology and cross-strait politics. By focusing on sand's mobile and malleable agency in rearranging geo-political order in this region, this essay draws on cartographic technology and documentary depiction of sand's multifaceted metamorphoses to present and negotiate what it means for human and nonhuman actors to live through sand's afterlives of displacement.

**KEYWORDS:** sand, extraction, border, political ecology, Taiwan Strait

In searching for a geophysical metaphor for same-sex desire and gender transgression in the Caribbean, the anthropologist Vanessa Agard-Jones turns to sand. Agard-Jones (2012) asks what it means "to pay close attention to sand, this object that exists at the point of nature's hesitation between land and sea" (326). "Hesitation" here refers to a paradox, one that captures the liminality of sand as the shifting border substance between the definable elements of land and sea, even while it proves to be peculiarly tenacious across space and time. Resisting geological assimilation into either concreteness or fluidity, the material durability of sand builds up precisely at the rupture where land and water rub up against each other. It is at this point of "nature's hesitation" that sand accumulates and accretes, generating energy from geological interplays.

For Agard-Jones, therefore, sand never fully submits its own agency to either side. It only polishes geological time while enduring through its flux. Birthed through nature's hesitation, sand embeds a deep deliberation over its bordering capacity, one that is malleable and mobile, always embodying the tendency to move, shapeshift, and self-redefine. Sand lets itself be soaked through and sedimented while retaining its own geological integrity.

This essay reaches beyond Agard-Jones's naturalistic framework to explore a different set of material and metaphorical coordinates that I term "the geological afterlives of sand." Catalyzed by extraction, transportation, and reassembly, the afterlives of sand follow the multifaceted metamorphoses of an elemental frontier, intrinsic to the landscape, into a resource for human intervention on geophysical, socio-economic, and ecopolitical systems. The following sections proffer one such story of sand's re-materialization from a coastal archipelagic region quite unlike the Caribbean islands: the west point of the Taiwan Strait, a region that encompasses mainland China's southeastern coast and extends into Kinmen, a county

that stretches across the water into two offshore islands administered by the Republic of China (ROC). The metamorphosis of sand across this border space provides a rich vantage point from which to critique the term "geo-politics" itself by unfolding the "geo-" along the grain of the symmetry and mutuality between geology and politics (Bobette & Donovan 2019). Dwelling on and beyond "nature's hesitation," I propose an ecological reading of this regional geopolitics. In the sections that follow, the material afterlives of sand simultaneously expose and allow us to explore a new dimensionality of borders that stretch across land and water, one that leaves behind the dominant geopolitical imaginary of horizontal territoriality to delve into a vertical axis of substrates.

If the naturalist framework allows us to sit comfortably within the ecological and geological emplacement of sand, being attentive to sand's geological afterlives requires the reimagining of dwelling through active reflection over sand's displacement. Even as sand becomes more visible as one of the planet's dwindling resources, it remains curiously invisible in environmental analyses of local and regional contexts. The subsumption of what I call the "rootedness" of sand in abstract frameworks of political economy, in which it is reduced to a commodifiable resource subject only to market forces of supply and demand, occludes the critical socio-political role of its material afterlives. What has happened to sand and sand-related actors in the Taiwan Strait presents a rich case study for challenging the monologic geopolitical framework of regional development with a multidimensional geo-logic counternarrative of its post-extraction afterlives.

## Mapping the Afterlives of Sand

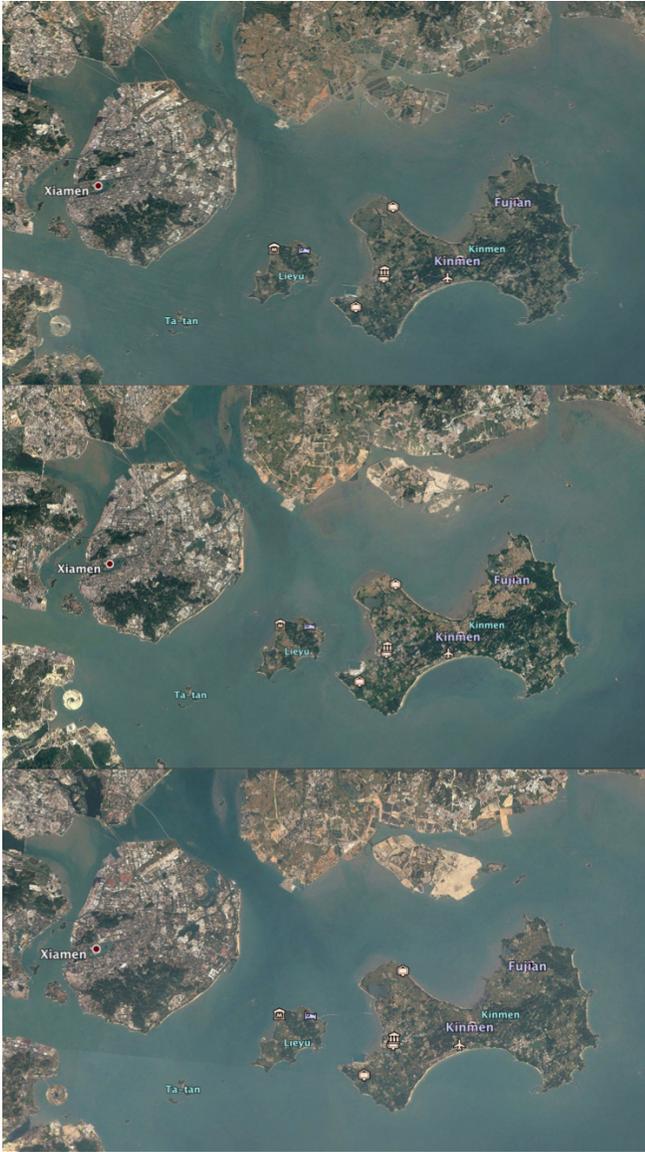


Image 1: Xiamen, Kinmen, Dadeng & Xiaodeng Islets, 2020. Source: Google Earth

The gulf of waters between Kinmen and Xiamen has been plagued with different geo-political conflicts for decades. Located in close geographic proximity, the twin islets have served as wartime frontiers and remain bisected by ideological divergences between the ROC-led democratic regime and the People's Republic of China-led communist regime, both powers claiming to be the legitimate government of China *de jure*. Sand, meanwhile, has emerged as a potent embodiment of the struggle for primacy over these contested waters: sand-dredging vessels, with simplified Chinese sprayed across their bodies, populate the gulf in unprecedented numbers, the sheer magnitude of their presence conveying an everyday message of geopolitical intimidation for the inhabitants on the shore. Judging by islanders' testimonies, however, sand-dredging implies a host of less-visible but no less existential threats for people living inseparably from the waters on Kinmen.

What differentiates this story of sand from narratives of general scarcity on a "world" or "global" scale is its deep geological and ecological rootedness—and conversely, the impacts of its material displacement from the seabed and the shoreline. The recent congregation of sand extraction vessels can be traced back to an airport construction project in Xiamen, located across the broader waters close to the mainland China, that began in 2013. This airport is itself sited offshore on two of Xiamen's neighboring islets, Dadeng and Xiaodeng, as well as their nearby waters connecting Kinmen. Over the past eight years, the municipal government of Xiamen has managed to reclaim six square miles of land out of the sea, broadening Dadeng Islet to such an extent that Xiaodeng Islet will soon be conjoined spatially with Dadeng and itself cease to be an island. As a vital element of the massive geoengineering project, sand has been granted an afterlife in a new geological process, one that displaces it onto a fundamentally different elemental foundation. The migrancy of sand foretells a future of infrastructure development and economic growth.

The geological afterlives of sand thus foreground a nature in formation, its vitality most manifest below the visible landscape. Between land and sea arises sand's massive re-materialization into firm land, as attested by satellite images.



**Image 2: Diachronic Images of Kinmen-Xiamen gulf, in 2013, 2016 and 2020; Source: Google Earth**

Comparing images 1 and 2 above, it is easy to track the stages in which sand is extracted, reengineered, and reborn. Slowly emerging out of the gulf waters, it metamorphoses into a distinct geological reality far from its place of origin, in the process perpetuating a political project of territorialization by the Chinese state. If the naturalist framework posits a horizontal orientation of sand's bordering capacity by bringing up its geological rationale of spreading across the coastland and sea floor, then, in its afterlives, sand has perpetuated such an expansionist logic but through accreting vertically from the unseen to the seen, across the interface of fluidity and concreteness.

It is sand's rematerialization in this particular borderscape (Rajaram & Grundy-Warr 2017) that transforms the act of dredging into a profound force of political ecology. Sand extracted from the water between Kinmen and Xiamen literally add land to the other

side of the shore. Adding to this semiotic-material complexity is the fact that sand-dredging is deemed illegal by both sides of the political conflict; nevertheless, the Xiamen government chose to purchase sand extracted from the gulf (Hao 2015). The resulting future airport, though distant from the twin islands on the gulf, would therefore perpetuate a borderless borderscape by the very material poured into its foundations. Sand thus becomes not just a negotiating resource but an active force for not just perpetuating, but actualizing China's decade-long rhetoric of unification, staking its geopolitical claim over the land and waters across the Taiwan Strait.

### Afterlives of Mobility and Malleability

On the other side of the gulf extending from Kinmen to mainland Taiwan, however—where dredging is seen as an act of resource theft and an encroachment on Taiwan's precarious sovereignty and territorial integrity—the story of sand is quite different. Here, the particles so necessary for the constitution of concrete acquire an almost-human quality as people debate whether the "theft of sand" is a border-crossing activity. Just like many other contested border regions, lines on this gulf have never been confidently drawn or erased, but remain permanently shelved. In this fluid space where borders remain ideologically fraught, sand itself has become the measure of identity and power.

On October 19th, 2020, the Taiwan Public Television Service released the 1077th episode of *Our Island*, a special docuseries project focusing solely on the environmental issues in Taiwan since 1998. Titled "Who Stole Our Sand," this episode, along with two others focusing on different offshore spaces centered specifically on the increasing anxiety over sand loss in Kinmen. It featured local oceanologists, environmental scientists, wildlife preservers, and aquaculture farmers in Kinmen, all of whose lives have been profoundly altered by the "theft of sand." Beyond the transformations sand loss has wrought on human lives and livelihoods, the documentary highlights its impact on existing knowledge about human-nature collaborations, ranging from beach retrogradation to habitat loss for endangered species. Paradoxically, it is through depletion that sand becomes a catalyst for collective environmental awareness among and across the diverse communities of farmers, scientists, and activists, as well as their everyday practices of scientific and practical knowledge. Sand loss also engenders questions about who should be liable for the large-scale environmental changes overwhelming the region.

Sand existentially demands geological knowledge to explain its ecological emplacement and displacement, enabling social relationalities to emerge and to afford scientific and political speculation. "The sand-dredging boats do not even need to overstep the border. The deep ocean is itself a naturally interconnected world with no national boundary." This keynote of the documentary takes us away from the visible landscape, where sand's withdrawal cap-

tured from the aerial perspective is only a tiny part of the picture. Neither the cameras nor the cartographic technologies can fully capture the depths across which sand—and its lack—can shape the unseen seascape. These are the unseen depths in which sand ceases to remain an inert assemblage of particulates in the solely human sphere of developmental activities. Rather, the afterlives through which it moves and travels as a result of anthropogenic interventions actively displaces it from human conceptions of its “natural” place and order.

It is precisely sand’s agential, unstable, and unpredictable mobility that “Who Stole Our Sand” foregrounds through the voice of Professor Chung-Pan Lee, a retired oceanologist. An expert on coastline changes and wave geomechanics, Lee excludes the interplay between meteorological and oceanological factors as sole explanatory frameworks for sand loss on Kinmen’s coastland. Turning instead to ocean geophysics and politics, Lee attributes ecological degradation to the increasing sand-dredging happening between Xiamen and Kinmen. Sand extraction has significantly altered the topography of the gulf floor, Lee infers, contributing to the deterioration of coastline conditions in Kinmen. From the oceanologist’s point of view, the material ecology of shifting sands under the water’s surface constitutes a literal manipulation and transcendence of cartography. On the one hand, while sand dredging embodies the process through which geology intersects with politics to co-produce the “geo-politics” of cross-straits relations, knowledge dredged from deep below the ocean serves to both expose and interrogate it. Sand’s perpetual mobility, in turn, compels humans to ponder the murky vicissitudes of its itinerary between land and sea, shifting the gaze from cartographically-oriented geo-political conflict towards the ecological and geological ramifications of its extraction, transportation, and reassembly.

One of the most astonishing examples of sand’s geological afterlives depicted in the documentary is an interview conducted with a councilor of Kinmen on the beach. In the background, an old burial ground lies exposed. Human bones as well as funeral urns are visible in the frame, scattered across the beach in the wake of their exhumation by retreating sand. Human remains here serve as material evidence of sand’s harsh withdrawal, a grotesque reminder of unprecedented landscapes made visible by a missing element that had sheltered the departed for decades. The episode’s apocalyptic imagination weaves together the afterlives of humans with those of sand.

Existentially malleable, sand not only moves across space and time but also redefines its own materiality. The extraction of sand from the sea floor has converted the beach into sticky mud, creating a felt structure of change shared by humans and nonhumans alike. The collapse of the shoreline due to a sand-deprived seabed jeopardizes not just memorial sites but also the very survival of species that depend on sand’s ability to nourish, cultivate, and serve as a resilient foundation for a variety of life forms. As a farmer in the documentary reminisced about the already-muddy coastland

where she has been collecting sea oysters, “it was once full of sand, ... (and) easy to walk on, but now there’s no way to step on it.” Sand has not only contested her knowledge about human-nature collaboration, but also challenged her assumption about the geological time of sand as unchanging and permanent. The critical issue for those who are native to these shores is no longer about how to fix their broken relationship with sand, but about how to imagine a future without it.

Nonhuman actors are also enmeshed in sand’s changing felt structure, as their lives have been unprecedentedly endangered with sand’s material redefinition. The documentary sheds light on one such species, the horseshoe crab, whose genealogy can be traced back to the late Ordovician period roughly around 450 million years ago. Indigenous to this gulf, horseshoe crabs, which prey on benthos dwelling in the sandy bottom of shallow waters, are living witnesses of the changing geological realities of sand in the region. The metamorphosis of sand to mud has silted up the habitat of horseshoe crabs and suffocated the benthos on which they feed; the crabs themselves lack oxygen as aerated pockets of sand are replaced by dense clay.

Withdrawing from the shoal, morphing into sticky mud, carried away by the dredging ships, sand has enabled the emergence of evidentiary ecologies (Lyons 2019) to further negotiate the question about liability and environmental justice. Its role in the co-production of geological and ecological knowledge involving human and nonhuman actors is exemplified in another case study from the documentary: aquaculture farmers working closely with the near-sea ecosystem. Constantly facing the sea prickling with dredging vessels, these farmers understand only too well the causal relationship between sand extraction and soil degradation as they became used to walking into the sticky shoals that are no longer sandy. “After the (sand-dredging) boats sailed by, everything has changed,” lamented a Kinmen resident who was seeking fish bait materials in the muddy coastland. But the question remains: “Who stole our sand?”

### Concluding Thoughts

“Who stole our sand?” The question concerns not just the physical whereabouts of sand, but also suggests that sand extraction is synonymous with political aggression and moral transgression. Against the developmental rationale for sand extraction, Lee offered a different framing for the retrogradation of coastal sand: a “loss of territory (*kuo tu*)”. Literally translatable as “national soil,” *kuo tu* imputes both ecological and geo-political meaning to sand, a resource that nourishes and cultivates life while demarcating the sovereign boundaries of a nation. Its displacement, consequently, becomes a bordering technology that amplifies the structural tensions between “here” and “there,” “us” and “them.”

In its geological afterlives, sand becomes a node of vital rela-

tions that extend far beyond its material environments. It becomes visible as an index of belonging to the local ecosystem and a symbol of the struggle of Kinmen, as well as Taiwan, for their respective claims to territoriality. To be sure, the figuration of sand as property is a construct of ownership, contested by the geo-political conditions in which it is materially and affectively embedded. Yet it is precisely at this juncture, where competition for territory is aggravated by horizontally-oriented geo-political disputes, that sand offers insight into the verticality of conflicts. The afterlives of sand re-negotiate its dwelling upon "nature's hesitation" by enabling a *deep* engagement with geologically-mediated ecological changes.

Beyond geo-political dispute over territory qua property, however, lies the reality of sand being a highly agential, mobile, and malleable entity that constantly contests the statist projects of

defining its propertiedness. The treatment of sand as either tradable commodity or preservable resource seems to fall back to the anthropocentric diagnosis of sand as an inert built environment. While many political actors in and beyond Kinmen have been actively seeking sand repatriation from mainland China, sand itself has demanded ecological justice in its own way. As presented in the previous sections, sand has mobilized itself as a powerful geological force to deteriorate and destabilize life itself.

What does it mean, then, when sand can no longer be taken for granted? Ultimately, this essay seeks to challenge anthropocentric notions of sand as an inert, fixed, and apolitical entity, even though it is constantly altered by humans. Sand does not merely function but lives its geological afterlives in flux, rearranging the geo-political order through its mobile and malleable agency.

---

#### WORKS CITED

- 西疆有事：誰偷了我們的砂？. Dir. Pei-Ling Lu. 2020. <<https://ourisland.pts.org.tw/content/7079>>.
- Agard-Jones, Vanessa. "What the Sands Remember." *GLQ: A Journal of Lesbian and Gay Studies*. Durham: Duke University Press, 2012. 325-346.
- Bobbette, Adam and Amy Donovan. "Political Geology: An Introduction." *Political Geology: Active Stratigraphies and the Making of Life*. Cham: Palgrave Macmillan, 2019. 1-36.
- Hao, Cheng. "厦门"砂盗"." 14th November 2015. *Chinese Business Journal*. <[http://www.cb.com.cn/investigation/2015\\_1114/1153261.html](http://www.cb.com.cn/investigation/2015_1114/1153261.html)>.
- Lyons, Kristina. "Chemical Warfare in Colombia, Evidentiary Ecologies and Senti-actuando Practices of Justice." *Social Studies of Science* 48.no.3 (2018): 414-37.
- Meredith, Sam. "A sand shortage? The world is running out of a crucial — but under-appreciated — commodity." 5th March 2021. *CNBC*. <<https://www.cnbc.com/2021/03/05/sand-shortage-the-world-is-running-out-of-a-crucial-commodity.html>>.
- Rajaram, Prem Kumar and Carl Grundy-Warr. "Introduction." *Borderscapes: Hidden Geographies and Politics at Territory's Edge*. Minneapolis & London: University of Minnesota Press, 2007.