

# Summary of The Hydrologic Cycle and Historical Societies Workshop

Duke University, Global Asia Initiative

February 18-19, 2022

Report prepared by Prasenjit Duara and Yuan Julian Chen

## Panel 1: Community and Commercial Waters

The two papers of the first panel, although focusing on different utilities of water, both perceive water as a unifying force of nature and culture. Chris Coggins (Bard College) uses many cases studies across monsoon Asia, some derived from existing scholarship and some based on his own field works, to illustrate the framework of “wind-water-carbon commons” in indigenous communities. In particular, Coggins examines the sacred forests, or “fengshui forests” in his own words, and brings to light the value of tradition and indigenous knowledge in maintaining a healthy, organic cycle of wind, water, and carbon in places where capitalism is not the only thing that counts.

In the discussions, James Scott makes a comment on achieving sacredness/purity through either modern industrial filtration or natural maintenance. Chris Courtney talks about the contestation of fengshui over issues of land use and manipulation. Coggins suggests that there are lineage wars over land use. But citing Tristan Brown’s work, he says the Qing state also makes judgments based on fengshui use.

Scott evokes Ostrom as possibly speaking to how this community value can be produced in large-scale societies. Chris Coggins responds that Ostrom has to consider cosmology, especially as seen through the ontological turn. The mountain god’s injunction works because it is a reality for the people. It is the connection of Oikos (economy and ecology) and polis through psychic or interpersonal relations that needs to be re-thought. Prasenjit Duara asks a question about translation, both practically and conceptually, when it comes to the interpretation of local knowledge. In response, Chris Coggins goes back to Ostrom’s resource system and subtractable quantities, which then makes it susceptible to game theory. We need to grant nature an ontological status, and that can be done only through cosmology. He says dialogical transcendence allows indigenous people to keep the ontological status that is granted to forests and also support them while keeping their own ecological ideas.

Known for her groundbreaking work on the environment of medieval North China, Ling Zhang’s (Boston College) new project shifts time and space to contemporary South China. She traces the history (as well as the present) of the famous Chinese bottled water brand, “Farmer’s Spring” (*Nongfu shanquan*), as a lens to investigate consumerism, capitalism, and globalism in modern China. The business idea of bottled water came to China in the 90s from the West with Coca-Cola’s entry into the Chinese market. In other words, the commercialization of water in China, like most other businesses and industries in China, follows the coming of Western capitals and

Western ideas. When introducing Farmer's Spring's business operation in China, Zhang describes how the company's advertisements about sweet water as natural backfired, forcing the company to explain that the "sweetness" comes from special natural nutrients from deep reservoirs. The idea of naturalness coming from the deep contrasts another prevalent belief that purity emerges from rarely visited heights such as the Tibetan Plateau. To judge the validity of both theories, whether they are truths or just urban myths, one needs to understand the molecular and chemical properties of water and its relationship with verticality. Overall, Zhang argues that the Farmer's Spring and its water source, the Thousand Islands Lake, are the geophysical and economical products of modern hydraulic constructions and the Cold War geopolitics.

In sum, Coggins and Zhang differ greatly in their methodologies and perspectives, one emphasizing fieldworks and indigenous culture while the other drawing on readily available textual (sometimes multimedia) sources of popular culture. But both papers demonstrate that water, whether perceived as a link in a sacred cycle or a goldmine of renminbi, is as much a cultural agent as it is a natural force.

## **Panel 2: Other Waters**

This panel truly broadens the traditional scope of water history. The presentation of Philip Steinberg (Durham University, UK) examines ice, the solid state of water, as an agent of livelihood and circulation in the Arctic. In contrast with the moving currents, ice provides a chance to study "slow hydrology" in a different hydrosphere. Steinberg's presentation seeks to understand the different mobilities and temporalities of water. While we often perceive the movement of water as flows, Steinberg points out that the mobilities of water in the frozen state are sticky and hence result in different temporalities, such as pauses and pulses. Steinberg channels the debate of whether other forms of water, icy or gaseous, should be perceived as more or less wet than liquid water.

Chris Courtney, also from Durham University, investigates the gaseous state of water. The region of his study, Wuhan in Central-South China in the Yangzi River Valley, is well-known for its humid weather. In the summer, high humidity in the air further increases the "feels like" temperature and forces people to seek various ways, from ice harvesting in the early times to air-conditioning and refrigeration in recent decades, to escape the extreme heat. The widespread use of air-conditioners and refrigerators in Wuhan has provided much-needed comfort and convenience for Wuhan residents. With refrigerators, people no longer need to buy fresh food daily. However, it is not hard to get off the habit and many people still do not trust food from the cold chain.

Air-conditioning has assisted the city's transition to a more "civilized" public space where men and children no longer need to stay outside topless for some cold relief. Taking on this point, Rohan D'Souza asks the question of if extremes, such as extreme heat and extreme humidity, bring people together and make people more social. Another effect of the increasing use of air-conditioning is its significant contribution to the urban heat island effect in the city. Some in the audience were interested in air-conditioning's percentage contribution to temperature increase in Wuhan. However, it seems such data is not readily available from current studies.

In sum, Steinberg and Courtney have drawn our attention to the non-liquid states of water and how these other states of water shape cultures and societies. This panel most directly speaks to the theme of this workshop: the hydrological cycle beyond flowing, liquid water. In the discussions, the participants further connect themes of this panel to the previous panel. Steinberg, for example, echoes Scott's comment in the first panel about the duality of modern science and local knowledge—while we use scientific tools to measure humidity and monitor the movement of ice, the Inuit use their time-tested knowledge to understand the temporality and mobilities of ice. The theme also appears in Courtney's talk when he addresses how people in Wuhan did not fully trust the cold chain, an example of how long-rooted local know-how resists the influence of new technology imported from the West.

### **Panel 3: Hypersea: Water Within and Without Us**

Jim Wescoat (MIT) and Helen Rozwadowski (University of Connecticut) gave two lively presentations on waters within us and waters around us. The water of interest to Wescoat is what he terms “human biological waters,” or human body fluids, that usually escape our attention either because they are hidden inside us or because they are so tiny in volume as compared with waters in rivers and reservoirs. However, the health and balance, or the lack thereof, of this small volume of body fluids depend on a massive amount of water for various uses – drinking water, sanitation water, irrigation water, and so on – as well as the nutrients, pollutants, disease vectors carried by these waters. A comprehensive study of the “medical hydrology” of the human biological waters, Wescoat argues, needs to arch over the evolutionary, historical geographic, and physiological perspectives of time and space.

Rozwadowski's presentation introduces the recent history of marine economy and the “ocean boosters.” Tracing the development and current status of human exploration of oceans in the US, Rozwadowski's presentation delineates a vibrant picture of pioneering ocean boosters pushing new frontiers into the unknown depth of oceans when terrestrial and freshwater frontiers are rapidly diminishing or even vanishing. However, as much as ocean explorations can give rise to new, exciting regimes such as blue technology and blue economy, some in the audience expressed concerns over disputes over ocean sovereignty and remained skeptical on the outlook of further tampering with nature. Related to human exploration of the ocean, the discussions further expand to how human society and nature can coexist in the broad sense. Even the so-called “natural heritage sites” are not pristine sanctuaries free from the human footprint. All environmentalists and conservationists need to be fully aware that even the best-conserved sites are co-productions of both humans and nature.

The talks in this panel also echo themes that have been raised in earlier panels. For example, Wescoat's general thesis of water and human health circles back to discussions on water's molecular and chemical properties, which emerged after Zhang's talk on Farmers Springs. Regarding water and health, Wescoat also points out the difference between the water/disease dynamics and the water/health relationship – the former is a category of scientific inquiries, while the latter is more of a holistic approach.

Together, the two papers offer an interesting contrast between the tiny volume of water within us and the endless expanse and depth of oceans beyond our view. This panel shows the possibility of studying water history and the hydrological cycle on both small and large scales.

#### **Panel 4: Rivers, Land, and Seas**

Dilip da Cunha (Columbia University), by pointing out that “wetness is everywhere,” challenges many commonly held (mis)conceptions about waters – water flows are bounded, rivers have single sources, floods are natural occurrences, and so on. These conceptions, he argues, stem from the long history of humans’ geological imagination and hydrological imagination of our habitats: seeing rivers as flows and floods leads to imagining land and water as a dichotomy. Rather one needs to engage wetness as the milieu of being. It is about seeing the earth surface as an assertion made by us to order this wetness and the river as intentionally drawn to contain and drain that surface of water. It is also to recognize that it is possible to live by engaging wetness in other ways and not necessarily by asserting a surface prone to disaster.

Rohan D’Souza (Kyoto University) echoes da Cunha’s thesis “wetness is everywhere.” Using a case study of a 19th-century hydrologic survey in South Asia, D’Souza vividly describes how hydraulic engineers observed and recorded the river’s pulses – monsoons, seasonal rainfalls, ebbs and flows, and aquatic species that lived on these pulses – that make the river a biological body. These alternative perspectives among colonial officials were not necessarily recognized or implemented in policy.

James Scott (Yale University) also engages with the concept of “flood pulse” but addresses the thesis from a more general perspective. His presentation hinges on the paradox that the impression of regularity implied in phrases such as “flood pulse” and “hydrological cycle” belies the fluid, often unpredictable nature of waters. The long history (as well as the prehistory) of humans trying to tame the untamable waters have succeeded and failed. While successes are mostly manifested in the short term in economic terms, failures, usually long-lasting, have created capricious monsters -- floods, soil erosions, waterborne disease vectors, extinct aquatic species, to name a few. Scott recognizes that in some places people are re-landscaping rivers and watersheds to restore the flood pulses. But he points out that many of these efforts, such as recreating wetlands and setting up conservational zones, do not actually restore the natural flood pulses because they are purposed for a different type of human desire for recreation and culturoscapes.

Developing from the specific theme of human tampering with flood pulse, Scott broadens the discussions to reflect on Anthropocene and lean into the histories of nonhumans. For example, he points out that for animals, their only chance of having a voice audible to human beings is usually when they permanently lose their voices – namely, when they go extinct. The audience pick up on this exposition and further points at the similarity between rescuing nonhuman voices and rescuing indigenous accounts, which some papers in earlier panels have also addressed. Da Cunha also leans into the Anthropocene argument and points out that anthropocentrism often arises from landcentrism, or how we have traditionally focused on living on lands and shunning

away from water. This insight not only summarizes the rationale of this panel but also precisely highlights the importance of this workshop on water and historical societies.

The audience engaged in lively discussions and brought up topics ranging from soil moisture to swampy diseases, from flood myths to wetland memories, from deforestation in the Mississippi watersheds to destroying Yellow River dikes in medieval and modern China, and so on. Chris Coggins suggested that following Prasenjit Duara's article, "Oceans as the Paradigm of History" (2021), this panel is officially ushering in a paradigm shift in water history. An overarching question that begs a more systematic answer is: how can we develop a new theoretical framework, in place of Wittfogel's classical work of Oriental Despotism, to access how humans perceive/experience the dichotomy and continuity of irrigation and inundation? This panel offers a lot of food for thought.

### **Panel 5: Dams**

The two speakers of this panel, Arunabh Ghosh (Harvard University) and Harry Verhoeven (Columbia University), examined the development of dams in Maoist China and present-day Ethiopia. The scales of their subjects of study differ greatly – Ghosh's study focuses on small-scale hydrological projects in rural China, while Verhoeven's paper focuses on the single most grandiose hydro project in Ethiopian history. This difference, in turn, shapes the different approaches and perspectives of these two papers.

Ghosh traces the dramatic spread of intensive hydraulic engineering across China and the ensuing expansion of irrigated lands in the early People's Republic. He illustrates the significant accumulative contribution of the hundreds of thousands of small-scale hydroelectric stations to China's overall hydro capacity. Using local evidence and statistical figures, Ghosh shows that these small projects, more than large projects commissioned by the central government, most profoundly influenced the economy and society in decentralized rural areas in China.

Verhoeven's paper, on the other hand, focuses on a mega hydro project in modern Ethiopia. The Grand Renaissance Dam, a state-sponsored infrastructure endeavor, promises to cure a variety of economic and ecological problems including poverty, food security, climate change, and deforestation. The Ethiopian government makes the Grand Renaissance Dam a symbol of Ethiopia's rise from the shadow of its past of hydrological inferiority, first to Egypt and then to the colonial powers. Therefore, this dam has become the government's device to legitimize the party-state rule and to shape the Ethiopian national identity.

Overall, although the countries and the types of dams they study greatly differ, both speakers demonstrate why party-states, such as China and Ethiopia, attach so much value to hydro projects. Dams, small or large, can noticeably increase agriculture output in the short run, hence bringing economic legitimation to the regime. However, the long-term ecological and social consequences of these dams usually fall short of, if not reverse the goals or promises of the local or central administrations.

Studies on small dams have traditionally been less abundant because they are often left out in sources. But small dams, or small hydrological projects and infrastructures overall, shed more light on decentralized local societies. Other than the cases given in Ghosh's talk, da Cunha shares with the audience an interesting example about small tanks in Andhra that collect rainwater. Although a proposal to pool these tanks together to make a big river sound appealing, people opposed it because linking the tanks and letting water flow imply sharing or giving away one's rights over water to people downstream. In other words, people would rather have still rainwater in smaller quantities than compete over a larger body of flowing water. Overall, small and large dams serve different purposes, work on different scales, reflect different power dynamics, and engage different types of sources. Although dams have been well-studied in histories and social sciences, this panel, by contrasting small dams and large dams, offers an interesting angle worth exploring.

### **Panel 6: The Hydro-social Cycle**

The last panel of the 2-day workshop consisted of three case studies of hydro-social interactions in the Murrumbidgee River watershed in Austria, the Loess Plateau in North China, and typhoon zones in coastal Southeast China.

Murugesu Sivapalan (UIUC) uses detailed data of the progression of reservoir capacity, irrigated area, agricultural output, and population size to trace the development of irrigation in the Murrumbidgee River Basin. He considers the human-river dynamics as encompassing parameters of different temporal scales, from observing river flows to calculating irrigated agricultural lands in the short term, from accumulating assets from water activities in the long run to raising environmental awareness beyond the horizon of one's own generation. The data Sivapalan presented demonstrates a clear correlation between increased water extraction and reduced streamflow, which, in turn, pushes wetland capacity to below the threshold level. However, visible wetland degradation often promotes environmental awareness and urges people to reevaluate how they use water and how much they use it. From the perspective of an engineering scholar, Sivapalan sees the hydro-social cycle beyond mere figure-crunching and advocates a full assessment of the cultural and social dimension of the human-water equilibrium or disequilibrium.

Micha Muscolino's paper is situated in Maoist China, the same time period as Ghosh's paper on small dams in the previous panel. However, while the small-scale hydro projects in Ghosh's study reflect how decentralized rural communities interacted with their local governments, Muscolino's paper focuses on a large-scale, state-led campaign to rapidly relandscape the Loess Plateau at the upper section of the Yellow River to combat soil erosion and reduce sedimentation deposits. Like any campaigns in the CCP regime, the Loess Plateau relandscaping campaign, which included afforestation, converting slopes into terraced crop fields, and building embankments and earth dams, hoped to deliver rapid, visible results but paid little heed to follow the natural hydrological cycle. The most disastrous component of this massive relandscaping project was the construction of too many low-quality earth dams, which not only proved ineffective in holding water but also resulted in washouts that actually increased, rather than decreased, sedimentation deposits into the Yellow River. On the social dimension of this

disturbed socio-hydrological cycle, the livelihood and living standards of local peasants were also greatly affected when their labor was drafted for such a large-scale state project.

The last presentation by Clark Alejandrino (Trinity College) studies how typhoons affected the lives of the coastal communities in Southeast China. This presentation echoes the second panel, “Other Waters,” as the formation and movement of typhoon engages water beyond its liquid state. Typhoon, a complicated hydrological process that overarches a chain of events such as evaporation, transpiration, condensation, and precipitation, was the single most prominent link in the hydrological cycle in these regions. Alejandrino analyzes the physical and climatological process of typhoon formation and draws on a variety of premodern and modern sources that document sightings of typhoons throughout history. The littoral communities, with their long tradition of observing and living with typhoons, have developed a toolbox of time-tested typhoon defense strategies and a variety of typhoon-centered religious and cultural practices. Since typhoons feature so prominently in their lives, regimes, including Mao’s China, have also utilized typhoons to achieve their agendas. In this sense, typhoon a destroyer and a builder at the same time – typhoon tears down ships and houses, but the shared experience of defending and surviving typhoon brings together communities.

In the discussion, the participants revisit many points raised in earlier panels. For example, Courtney and Muscolino both discuss local knowledge on typhoons and soil that were produced and summarized in the Mao era. However, while the previous panels mostly describe the value of local knowledge, Muscolino points out that the value of local knowledge depends on how it is applied and who it benefits. For example, local knowledge of dam building techniques in Dengjiabao, when improperly carried out, led to many disasters. Scott raises the issue of slow hydrological processes in the face of fast social events. For example, the usually slow process of soil erosions and sedimentations can be suddenly accelerated by large-scale campaigns like the Great Leap Forward, as Muscolino’s talk has demonstrated. This is not only a process of human intervening nature, but also a conjuncture of historical and historiographical time. Overall, all three presentations have combined quantitative scientific methods and human responses to various degrees. They point to a promising direction of interdisciplinary research on socio-hydrological processes.