NOTE
FROM THE DIRECTOR, NGMA

As the Director of NGMA I am extremely proud to host the exhibition, *Soak: Mumbai in an Estuary*, conceived and produced by Anuradha Mathur and Dilip da Cunha. The exhibition extends the language of design, planning and architecture in a conceptual, visual and graphic manner, treating the Mithi, a river of Mumbai, as a metaphor with a sense of totality. It addresses intangible pertinent questions relevant to society, geographical issues, and anthropological concerns of our times.

The interdependence of architecture, planning and urban design achieved through the language of landscape, which combines the capacity of artistic visualisation and the potent energy of conceptualising terrain, is the only perceptive way that can challenge the design concerns of our overgrowing cities. In this regard *Soak* transcends the representations of technology, ecology and many other facets of design that inform interventions in the city.

*Soak* addresses the question of legacy cultivated through the use of artistic elements like maps and solutions that are temporarily sought in the wake of floods in an ad-hoc fashion. It juxtaposes maps of the coast line against a landscape that defies the map itself in a complex terrain which has been forgotten and buried deep under a metropolis that has grown over and obliterated the past and the real below. In this fashion *Soak* addresses a real time issue that Mumbai faced in the year 2005 with floods that brought the entire city to chaos.

The exhibition reinterprets and conceptualises this unseen landscape through a range of innovative drawings, photoworks, maps, projects, etc. It raises pertinent and relevant questions about visualising landscape in the context of the art of mapping. The interdisciplinary use of landscape panorama, the framework of map-making, montage, digital and sound media have been intelligently utilised with a sense of totality, binding all facets of design in a meaningful and experimental fashion.

Anuradha and Dilip have conceptualised and produced a number of exhibitions in the US and India, notably, *Mississippi Floods: Designing a Shifting Landscape* and *Deccan Traverses: The Making of Bangalore’s Terrain*. As the Santa Fe Art Institute aptly put it, they are ‘interdisciplinary visionaries: wedding urban planning with social anthropology, architecture with environmental science, the architect’s sense of structure with the historian’s sense of deconstruction; breaching disciplinary boundaries to discover truths that have relevance for understanding the past, engaging the present and visioning the future.’

In the words of its creators ‘Soak is about making peace with the sea; about designing with the monsoon in an estuary’.

I wish the exhibition a great success.

RAJEV LOCHAN
Director, National Gallery of Modern Art
Jaipur House, New Delhi
FOREWORD

Soak opens up new directions for the science of cities. In the study of urban places, as in the making of Mumbai, there has been a hard edge, dividing the sciences of measurement planning and control from those of interpretation, representation and poetics. The work of Anuradha Mathur and Dilip da Cunha inspires us to create a wetter, softer science of the city, which might allow number, measure and border to soak up the messages of the human sensorium, of memory and dreaming, which soften the lines between density and lived demography. The flow of water through the life of Mumbai is not just an ecological fact. It produces an ever shifting medium through which the ‘production of locality’ is enabled. To try to contain these flows, in an effort to create the terra firma of urban planning, is to lose many opportunities. Soak encourages us to explore some of these lost opportunities, these places of wet theory and urban generativity, which the monsoon both performs and reveals.

Wet Theory

Thinking about anything is hard. But unthinking – undoing the way we have thought about anything – is infinitely harder. In the remarkable work of art and craft that is this exhibition by Anuradha Mathur and Dilip da Cunha, we are gently but forcefully drawn into an exercise in unthinking. In this case, the unthinking is about the place we now call Mumbai. The unthinking that this project invites concerns the very idea of place, of time and space, of insides and outsiders, and above all of what we mean when we contrast the categories of land and sea.

An estuary presents designers with a challenge that begins with the need for a new visualisation.

The picture of Mumbai’s past – and future – which is drawn in this remarkable project is an elaborate visual poem about what it means for one of the world’s great cities to be viewed as a space which ‘is not just in an estuary, but an estuary in the monsoon.’ This second to last line in the text of the catalogue that follows is the aphorism which we are helped to understand by the gradual journey through a new terrain of terms which Mathur and da Cunha recover and deploy in such a manner as to liquefy, both literally and figuratively, the ground beneath our feet. These terms include such familiar words as section, horizon and plan, as well as beach, maidan, map, and coast.

Their text, and the remarkable visual creations that the exhibition puts on display before our eyes, force us to read the history of Mumbai in a new way and to recognize that what we today regard as the hard edges between land and sea are produced by a remarkable double helix, of which one strand consists of three centuries of efforts to create clear and permanent lines in a terrain that is forever on the move, as land meets sea, and as saline water meets fresh water in the estuary which was hammered into the shape we now call Mumbai. The other strand is a parallel and necessary exercise in technical efforts to battle, contain, fix, and channel the flows of water in the estuary by the building of bunds, walls, embankments and the like. In other words, Mumbai’s apparent hard edges are the historical product of a determined effort to imagine lines where none exist and then to make them survive in the face of an aqueous terrain which constantly defeats their materiality.
Design in an estuary, particularly an estuary in the monsoon, solves the problem of flood not by flood-control measures, but by making a place that is absorbent and resilient.

The great flood of 2005, in the story told in this catalogue and in the exhibition is a story of a misnomer which gave birth to a catastrophe. A place designed to soak, through the practices of naming, mapping, engineering and planning over the course of more than three centuries, was turned into a place destined to flood. The Mithi River, the villain in the conventional story of the 2005 flood, emerges here as the symptom of the series of efforts to create fixity in a terrain of change, to create hard edges in a world of flow, and to cordon of wet and dry spaces from what are in fact wet and dry moments in a temporal drama of ocean and estuary, coast and beach, rain and tide.

The implications for planning and design of this radical revisioning of the basic terminological and conceptual habits through which we have viewed Mumbai are specific, numerous and unsettling. In addition to opening new approaches to flooding and drainage, water storage and distribution, work and transport, production and exchange, the most unsettling advice that this project has for planners and designers is: give up the illusion of permanence! If Mumbai’s aqueous terrain is a constantly changing site of negotiations between land and sea, monsoon rains and shifting drainage gradients, design and planning, like urban life itself, must conform to the logics of negotiation, uncertainty and fluidity, in all its senses. For the social sciences, more generally, this revisioning of Mumbai’s aqueous reality and its spongy porosity, and the argument that the search for Mumbai’s hard edges is both foolish and dangerous, has a deeper allegorical force. It is an invitation to build more of what we call ‘wet theory.’

What do we mean by wet theory? Firstly, we mean a way of building explanations and models which accommodates flux, flow and other boundary-blurring phenomena at the core of theory rather than at its reluctant boundaries. It means that the phenomena of motion, of migration, of disturbance and of change must be, where appropriate, the building blocks of historical and geographical interpretations and not regarded as exceptional or outlier phenomena. Secondly, wet theory is theory that is indefinitely open to absorbing or ‘soaking up’ new contextual information without bending the context or breaking under the strain of its own rigidity. Wet theory is theory that bends before it breaks. If we take up the old Peperian idea, still not a bad approach to science, of ‘conjecture and refutation’ as vital to the life of explanations, we might say that wet theory allows conjectures to soak up refutations and thus morph steadily into new conjectures, rather than through the process of sudden, quantum leaps or breaks. Finally wet theory is theory that recognizes its own uncertain footing, that is humble before the ruthless tyranny of context, and that is always ready to negotiate with the facts that sweep up against its shores or rain down on it from the heavens. Wet theory need not rely on a hard edge to divide the plausible from the implausible but allows a steady soaking or filtering process, through which today’s implausibilities can sometimes become tomorrow’s banalities (and vice versa).

These reflections on wet theory may seem far afield from the vivid and unsettling story that Anuradha Mathur and Dilip da Cunha have to tell about Mumbai’s aqueous uncertainties. The power of Soak is that it opens up the softening of many hard edges, starting with those which have dominated our ideas of terra firma in Mumbai.

ARJUN APPADURAI
CAROL A. BRECKENRIDGE

Manhattan
April 2009
After the vastness and extended horizons of the Lower Mississippi which we explored a decade ago, the Mithi River in Mumbai, as a friend put it, is a 'come down': it barely extends fifteen kilometres and its existence is largely unknown even to people in Mumbai. However, we did not notice the difference when we first came to the Mithi a year after a heavy monsoon downpour caused death and destruction in North Mumbai in July 2005. We were drawn instead by the similarity in the lens worn by administrators and the public: the lens of flood. This lens calls attention to water crossing a boundary, a truant defying its place. It is a lens that comes with a built-in solution, viz., reinforce boundaries between land and water. As such it is particularly attractive to 'experts' for whom it is easy to say keep water in its path, improve drainage and where necessary, keep the sea out. We noted the popularity of this lens in the Lower Mississippi where flood has become the unquestioned language of everyday life and water an enemy in a fight for land. It is a fight that has seen many battles over three centuries, most recently in New Orleans where, four years on, land is still recovering from the beating it received from waters stirred by Hurricane Katrina.

The response of officials and experts to the events in Mumbai that occurred a month before Katrina, therefore, did not really surprise us: Mumbai had a drainage problem and required drain improvement. The Mithi was singled out as a primary culprit and a 'master plan' is underway to 'train' it as a drain that performs to demand.

Flood is simplistic. But flood in a monsoon landscape and estuary is particularly—and disastrously—simplistic. We resolved not to merely come up with an alternative to the master plan underway but to also investigate where professionals and the public who clamour for better drains lost their appreciation and accommodation of the material and temporal complexities of a monsoon landscape; how Mumbai acquired the lens and not just event of flood. In other words, we resolved to resist the 'what-are-your-recommendations' culture that allows experts to differ, even innovate, in providing solutions or defining problems, but not question the lens of flood. Such questioning does not come across as practical in the aftermath of a disaster when government is called upon to 'deliver' before the next monsoon and not argue visualisation.

As in our previous work, we follow a parallel course to the problem-solving and largely reactionary mode of governance that traps places following a disaster. We offer recommendations through a new visualising of Mumbai—Mumbai-in-an-estuary—where the lens is resilience rather than flood. It took us over two years to develop this lens, far too long for a government preparing to take on the next monsoon. But a lens as deeply embedded in the ordinary and everyday as flood involves questioning so many things that are taken for granted in an unfolding tragedy that is far more extensive than the events of July 2005.

We have chosen to communicate the critique of flood and the possibilities of its alternative not through a report to government, but rather an exhibition for the public. It was a method favoured, perhaps initiated, by Sir Patrick Geddes, a resident of Mumbai in the late 1910s and early 1920s and for a time professor of Sociology and Civics at the University
of Bombay. He was instrumental in making master planning of cities in India (and elsewhere) a critical task of local governance, particularly its aspect of 'folk planning' in conjunction with 'place planning' and 'work planning' and its demands for what he called 'diagnostic survey' and 'conservative surgery'. But he also believed in instilling in the public an expectation and way of seeing their place as a prelude to planned solutions implemented by government. To this end he travelled through a number of settlements across India with a public exhibition of maps, plans and other visualisations that exposed the problems and potentials of these places by situating them in a history of the city that began with Athens and passed through London. The master plan, which he advocated, has stirred much debate over the twentieth century; but little is said about his exhibition, which is firmly embedded through education and administration in the professional and public imagination and remains a powerful agent of public involvement. Today, this exhibition, which reinforces the lens of flood and the colonial enterprise of the map that encourages the visualisation of flood with the articulation of boundaries between land and water, requires urgent review. Soak initiates this review. It provides a context of seeing Mumbai not as a city in history but a place in an estuary. To this end, this book serves as a catalogue of an artistic endeavour that challenges conventional visualisations of Mumbai as well as an extended arm of an activist agenda that encourages the expectation of new possibilities for 'another' Mumbai.

In the early stages of our investigations, when we were still absorbing the physical impact of the flood of 2005, we led a design studio on the Mithi River with students from the Landscape Architecture Department at the University of Pennsylvania. We encouraged them to challenge the master plan reading of the Mithi as a controllable entity and to come up with solutions that went further than channelling a river and landscaping a riverfront. Their work, the subject of a studio publication [Mithi River: Re-articulating Mumbai's Landscape], opened new horizons for us as well as our sponsors, the Indian Merchant's Chamber Foundation, Mumbai. During our field visit to Mumbai we benefitted much from the assistance of Pallavi Latkar whose interest in the Mithi overlapped with ours. Sanjay Ubale, then Secretary, Special Projects, Government of Maharashtra, listened to our concerns and was quick to grasp that landscape architects could be more than embellishers of an engineer's plan. He was open to accommodating our suggestions within the master plan of the Mithi.

However, we were already beyond the master plan of a river, looking at the making of the lens of flood in Mumbai and documenting an estuary. It involved spending time in Mumbai, carrying out our own investigations - walking, drawing and photographing what maps cannot depict, books cannot explain, and Slumdog Millionaire can only speed through. Here we owe a huge debt to Kavita Khanna. It is fair to say that without her this project would not have been possible and where it is, is due to her skill, example, patience and affection. She - with her husband Vinod Khanna (MP) and children Sakshi and
Shraddha - not only put us up and cared for us with a generosity so rare, she also cared for the project, always encouraging us to go further while making that further always possible for us. Today, Kavita, we can say, is more than a friend; she is a partner in Soak.

The shift to seeing Mumbai in an estuary also involved travelling to that centre of the British Empire that cemented the lens of flood on the Indian subcontinent so well and completely, London. Here we thank Maria and Winston Coutinho for hosting us during the enlightening days that we spent in the British Library and the Maritime Museum. There were other proxy centres that we turned to in the search for historic information, not least, the Library of Congress and the Rare Book Collection at the University of Pennsylvania where as always we benefitted much from the assistance of John Pollack. Our graduate students, Robert Johnson, Megan Born, Masafumi Oka, Emily Vogler, Rebecca Fuch, and Noah Levy appreciated the urgency of the work and made time for our sporadic demands on their time.

We consider ourselves fortunate to work with Ram Sinam, our book and exhibition designer. After two exhibitions on our own we realise how much he brings that we missed. Only he can accommodate the uncertainties of the shifting landscape in which we operate. Ram, his partner Sarita Sundar and their office, in particular Aparna Ranjan, have been more than designers to us; they have pushed us with ideas, solutions, and demands that have only worked, as we see it, to improve the project of Soak.

We see our work as art before science; art that questions the ‘things’ and their visualisation that ‘experts’, such as engineers, ecologists, and planners, often take for granted. Hence to exhibit Soak at the National Gallery of Modern Art is a true privilege. Here we are the beneficiaries of the vision and enterprise of Rajeev Lochan, its director and a teacher at heart, whose bold initiative has extended the mandate of the NGMA to include design issues of cities. We are also grateful to R.K. Mehra who despite the rough economic times has seen an intrinsic value in our endeavour and has extended himself and Rupa & Co. to co-publish this book.

In New York, Carol Breckenridge and Arjun Appadurai have been an inspiration not merely in bridging education and activism but also reaching beyond the boundaries of disciplines in a time that badly needs it. They have always shown a keen interest in Soak and we are honoured that they have taken the time to write a foreword to this work. To an extent, their invitation to participate in the 3rd Annual PUKAR Lecture in Mumbai in August 2006 sowed the seed of this project when at the end of our presentation we were asked by a member of the audience if we could bring the insights that we had developed in our work on the Lower Mississippi and Bangalore to the Mithi and Mumbai. For one of us who grew up for a period in Mumbai and the other whose family has deep connections with the city, it was a provocation not easy to pass, even if it meant putting off other projects and involvements. Needless to say we have not regretted the derailment (as yet) and have thoroughly enjoyed engaging a terrain so rich in histories and controversies.
The second last paragraph is always left for the indispensable, the unshakeable and the relatively choiceless family. They ultimately bear the brunt of the questioning, puzzlement, testing, fatigue, and sometimes, frustration and anger wrought by the pursuit of flood. Indeed they show us in an analogous way what the alternative of resilience requires and can be. Here we owe much to Anu’s parents, Brijesh and Sardar Mathur; and our siblings and their families, Alok, Chandrika, Ruchi and Chhavi, Francis, Vatsala, and Shashwati, Alka, Amitabh, Nupur and Abishek. In Philadelphia, we owe much to so many on what must surely be the most unusual, talented and child-populated block in the city. Here we single out Pat Lavelle. Over the years she has become family, seeing us off and welcoming us back, making our ruptures bearable and easing our anxieties when we are away.

Our daughter Tara, who has followed this project more closely and rebelliously than others, is at an age of scientific curiosity. At eight, she is more excited at the prospect of travelling the Amazon with us than the Mithi. After all schools teach children about the big things that fit geographic categories with little doubt rather than the small things that do not. This is probably true of children in Mumbai as well. They learn about the Indus and the Ganga and the ‘great civilizations’ that these big rivers spawned, before, if at all, they learn about the uniqueness and particularity of their own place. But Tara merely says: ‘I want Mumbai to be a better place; I don’t want trash on the ground or a stench in the Mithi.’ Here we can only repeat what Lewis Mumford believed was Patrick Geddes’ message to the next generation: ‘Geddes bequeathed to them no finalities of dogma and doctrine which could be misused as a substitute for fresh observation, fresh experiment, and fresh thought. . . . Geddesian philosophy provides for its own correction and its own replacement.’ We hope that Tara will go further than desiring a better place to understanding places like Mumbai in a different light.

notes
1 See Mississippi Floods: Designing a Shifting Landscape, (Yale University Press, 2000)
2 In the case of the Mississippi, this reactionary mode of governance has become an everyday practice. In the case of Bangalore, the disaster is not a singular and life-stilling event as in the Mississippi; instead it is a number of instances of congestions, violations and shortages that make public initiatives, such as city plans, less about pushing a vision and more about reacting to multiple crises. See Deccan Traverses: The Making of Bangalore’s Terrain (Delhi: Rupa & Co., 2006). In both, the Lower Mississippi and Bangalore, we offered a new visualisation of terrain.
The flood of 2005 was as local as it was exceptional. 944 mm of rain fell on a part of North Mumbai in the same time that the observatory in Colaba in South Mumbai registered only 75 mm. It is easy to see this disparity and amount as a rare occurrence; it is more difficult to appreciate it as a possibility any monsoon day. To consider this event a rarity is to work by probability, the practical mode of analysis adopted by administrators and planners which asks if it is worth accommodating an event that occurs once in a 100 or perhaps even 500 years? To consider this event an everyday possibility requires the appreciation of uncertainty; the fact that the monsoon, particularly in its localness, eludes prediction. Soak takes the second approach.

Image courtesy: Reuters
Monsoon in an estuary

Until recently, Mumbai was accustomed to being soaked by the monsoon. The rains of 26 July 2005, however, did not soak the city; they flooded it. Hundreds died and much property was lost as parts of Mumbai went under many feet of water. Those rains were unusual. The average for the whole season fell in a day – 944 millimetre [mm]. It was one of the highest ever recorded anywhere on the subcontinent since systematic meteorological recordings began in the 1800s.

However, it takes much less to flood Mumbai today. Three years on, 100 mm of rain or less is enough to cause a 'flood' and suggest that Mumbai is shifting from welcoming or abhorring a soak by the monsoon to fearing and fighting being flooded by it.

Soak to flood is a profound shift. It makes an enemy of a friend, even if it is a friend who is not always welcome. People are advised to carry hammers to break windows of their cars in case their automatic systems fail in high water; administrators and engineers work overtime to drain the monsoon off the land as fast as possible; and the United States’ Consulate predicts ‘13 dangerous days of the monsoon’ of 2008 and warns its citizens in Mumbai to be prepared. Awaiting the monsoon for better or worse is increasingly being replaced by a readying for battle.

However, as much as the events of 26 July played an important role in the shift to flood, the war against the monsoon has been long coming. British administrators of Mumbai from the time of its conception as a fortified centre of trade in the 1660s, saw the monsoon as a ‘foul-weather season,’ an interference to trade and commerce, an impediment to the critical functions of governance, such as surveying land and maintaining infrastructure, and a spoiler of an otherwise fair-weather landscape. It has taken three and a half centuries, and ironically, ‘independence’ from their rule, for their view to become the common ground and for their war against the monsoon to be fought by a city without question and without regard for its soak.

It is this build-up to war against the monsoon, a phenomenon, which once provided not just water but wonder, that we believe must serve as a point of departure for design and planning in Mumbai today.
The build-up to war has occurred on many fronts, not least education, administration, and the belief promoted by both that nature can be controlled through prediction and technology. But it has occurred more pertinently, from our point of view, through the cultivation of an attitude to terrain grounded in the belief that land and water are separable. This attitude has encouraged a landscape of hard edges and clear and distinct entities, and fostered a spirit predisposed to privileging land over water, firmly held property lines over open terrains, defined land uses over fluid occupancies.

It takes a considerable effort to enforce firmness anywhere, but it is particularly difficult to do so in an estuary, the primary ecology of Mumbai. Unlike deltas where rivers reach into the sea, estuaries allow the sea in. As such, the rise and fall of the sea is not restricted to a coastline, but is carried inland on a gradient that takes with it not just predictable tidal levels, but also the complexities of the world's oceans where the unexpected reaches beyond the horizon and often beyond control. Here the war against the monsoon is also a war against the sea. Thus people are warned to be aware of heavy rains coinciding with high tide in a city designed to drain into the Arabian Sea. 'Heavy rain + tide = city under water' read a newspaper headline at the start of the 2008 monsoon season. Fighting the monsoon in Mumbai entails keeping out the sea.

The sea, however, in Mumbai has long been considered the more serious enemy. If the monsoon has been cultivated as a seasonal opponent, the sea has been made a perennial one. Sea walls, landfills, causeways, tetrapods, knowledge and prediction have been used to keep the sea out. The successes of Mumbai on reclaimed land and behind the security of a battlefront have been far too loud to notice the occasional failures that have occurred ever since the first embankments were built in the late 1600s to keep the sea out from 'saline lands' in the heart of what is today South Mumbai. The 2005 flood, however, stilled Mumbai long enough to take notice of the sea within land's edge. It is an occurrence that can be expected to occur more often with the predicted rise in sea levels.

An estuary demands gradients not walls, fluid occupancies not defined land uses, negotiated moments not hard edges. In short, it demands the accommodation of the sea not a war against it, which continues to be fought by engineers and administrators as they carry sea walls inland in a bid to both, channel monsoon runoff and keep the sea out.

**Soak** is an appreciation of an aqueous terrain. It encourages designs that hold monsoon waters rather than channel them out to sea; that work with the gradient of an estuary; that accommodate uncertainty through resilience, not overcome it with prediction. It moves Mumbai out of the language of flood and the widely accepted trajectory of war with the sea and monsoon that this language perpetuates. It recovers the world of soak.

**Soak**, in brief, is about making peace with the sea, about designing with the monsoon in an estuary.
An estuary demands gradients not walls, fluid occupancies not defined land uses, negotiated moments not hard edges. In short, it demands the accommodation of the sea not a war against it which continues to be fought by engineers and administrators as they carry sea walls inland in a bid to both, channel monsoon runoff and keep the sea out.
There are three sections to Soak.

The first section looks at the build-up to war against the monsoon as rooted in a belief that land can be separated from the sea. It is a belief that is integral to the biblical story of creation — ‘And God said: Let the waters under the heaven be gathered together into one place, and let the dry land appear. And it was so done. And God called the dry land, Earth; and the gathering together of the waters he called sea. And God saw that it was good.’ [Book of Genesis, 1: 9-10]. This belief found its most powerful instrument in the European enterprise of mapping that would make the land-sea separation not just a commonly accepted reality, but a stark divide, represented by a firm line. As difficult as it is for anyone to divide land and sea on beaches, boulder fields, and mangrove swamps, which are common in Mumbai, the map does so with a simple line. And though surveyors, who made mapping a professional discipline in the eighteenth century, use increasingly sophisticated ways to justify and draw this line of separation, it leaves little room for the appreciation of the complex, temporal and fluid gradient of an estuary.

Indeed it is difficult to separate Mumbai from the enterprise of the line drawn in maps as a view from above. Map-making and city evolved together from the time that the Portuguese granted an aqueous terrain to the English on the basis of lines drawn on a piece of paper. This ‘visualising’ of territory from above was bound to be controversial in its correspondence to the fluid and dynamic world of an estuary. But once the English got a foothold, they made a reality of lines drawn where edges would most likely be rather than already were. Boundaries, sea walls and causeways, city plans and building projects have all been used to realise these edges and make an island entity out of a swampy land which one visitor, John Fryer, a medical officer in the service of the English East India Company who visited the area in the 1670s, described as ‘disputable’: ‘From Chou Point to Bacein [two famous Cities belonging to the Portugals] some 30 Leagues distance, lye those Spots of Ground, still disputable to which side to incline: For at Low Water most of them are fordable to the Main, or from one to the other; and at Spring-Tides again a great part of them overflown.’

The significance of the drawn line in articulating the divide between land and sea has largely passed unnoticed. But it reveals a Mumbai created as much by the visualising demands of the map as by the heroic efforts of land reclamation, harbour building, water supply schemes, and other grand projects that have realised Governor Gerald Angier’s determination in the late 1600s to make ‘a city which by God’s assistance is intended to be built.’ Not surprisingly this Mumbai has little room for fluid and fuzzy landscapes of the coast like the mangrove swamps, not just because they are, as often claimed, a source of illness and bad odour, but also because they cannot be demarcated in plan, the view from above which is how maps depict the world. As such, these landscapes were considered part of the undifferentiated sea or as land ‘invaded’ by the sea that could justifiably be ‘reclaimed’. They are still referred to by engineers as ‘bad lands’ while slum-dwellers claim to have done the city a service by reclaiming the marginalised wet grounds that were once beneath them.

The line, as can be expected, privileges land over sea for it is drawn with the firmness of terra firma. Today, it is etched even more firmly in the imagination than it is on paper for land in Mumbai has become, as Suketu Mehta observes, ‘the reigning obsession, the fetish, the raison d’être and the topic around which conversations, business, newspapers and dreams revolve.’ But even more than an obsession land is taken for granted where a little more than a century ago it gave men like Govind Narayan reason to wonder ‘is it not an astounding feat,’ he asks in his Mumbaeche Varnan, which is said to be the first biography of Mumbai published in 1863, ‘to recover the land from the sea and make it habitable and free of disease and earn lakhs of rupees in the process?’
This section traces the drawing of the coast line; its tentative, if artful beginnings in early European maps and its pursuit in the 'fair weather season' by English marine and land surveyors in the eighteenth and nineteenth centuries. The profound impact of islandness that this articulation cultivates does not stop at the coast; it extends inland to make islands of other elements common in today's vocabulary of the city - open spaces, buildings, streets, rivers and other land uses of the geographer, planner and surveyor; indeed the city itself. The spirit of the Island City is separation prior to connection, divides before thresholds. Here the war against the monsoon and the sea is an effort to maintain firm lines of separation. The divide between land and sea is only a beginning.

In the second section of Soak we draw out landscapes that survive beyond the delineating eye of the surveyor and pervasive colonial descriptions, both appreciative and critical, that begin by seeing Mumbai's terrain divided into objects in geographic space. These landscapes, which include swamps, oarts, talao's, and bazaars, occupy the fluid and open gradient of an estuary, a terrain that operates more as a filter between land and sea than a line between them. They demand a different way of seeing and a different mode of representation. Resisting the surveyor's view from above, they call for the use of the section, an articulation that makes depth critical to the fluid relation between land and sea, and by extension, the relation between salt and basalt, mangrove plants and Mumbai's palms, saline and fresh waters. Sections offer a powerful visualisation of the open relationship between land and sea while their drawing in sequence speaks to the diverse rhythms of movement between the two. Sections also reduce the significance of boundaries and edges in the landscape, positing instead the horizon which one approaches, but never crosses. They call attention to intersecting continuums rather than finite adjacencies. Finally, these landscapes diminish the importance of geographic space, the milieu within which surveyors measure distance accurately from point to point. Instead of space they call for time, releasing landscapes from being held down to points in space and as such allowing the appreciation of their fluidity.

It is through section, horizon and time that we represent the landscapes of Mumbai's estuary. We organise them by their significant performance as enterprise, deposition, saturation and appropriation. These landscapes are not mutually exclusive and therefore not a kit of parts as are planners' land uses or geographers' landscape typologies of forest, river, city, land, sea, park, road, building, which sit adjoining each other on maps. They are rather mutually inclusive, each activating unique materials and moments of an estuary.

Mumbai's estuary does not lend itself to master planning, which is a way of designing the future that takes the plan-view of maps for granted and as such is predisposed toward the firmness of land and the controlling devices that come with it, such as land-use divisions, zoning regulations and enforced boundaries. These devices not only demand a clear articulation of geographic space, they also call for a simplified view of everyday life that compartmentalises it into residential, commercial, recreational, industrial, drainage, and transportation, or 'mixes' of two or more of them. Landscapes of the estuary elude this visualisation predisposed to control, which is why they were the 'other' in a colonial era and why they survive contentiously as the 'informal' sector of planning and administration today. It is also why these landscapes are both threatened and threatening.

It is in this context of the visible and invisible, the formal and informal, that the Mithi, Mumbai's poster child of the war against the monsoon and the sea, came to light. Few knew of its existence.
Mumbai’s history, in most accounts, pivots on its European occupation – the Portuguese from 1534 to 1665, but more significantly the English from 1665 to 1947. Little is said in these accounts about an attitude to and vocabulary of terrain that was constructed through this occupation, a vocabulary that rests on a fundamental belief not necessarily shared by previous occupants of Mumbai, namely, that land and sea should be divided. This division was instituted by European seafarers, but more concertedly by English marine and land surveyors in the late 1700s with the drawing of a line on a map. This line traverses rocks, swamps and beaches of an aqueous terrain, asserting entities that are taken for granted today in descriptions, planning, and everyday administration of Mumbai. Three of these entities are significant: the island of Mumbai, the coast of the Indian subcontinent, and a major concern following the 2005 flood, the Mithi River. The reality of these entities cannot be questioned. But they are essentially things singled out from the dynamic, at times chaotic, terrain of an estuary by an eye driven to simplify, perhaps at a cost that is being paid for by floods in Mumbai today.

John Fryer in the 1670s referred to Mumbai as ‘Spots of Ground, still disputable to which side to incline: For at Low Water most of them are fordable to the Main, or from one to the other; and at Spring-Tides again a great part of them overflowed.’ But even as Fryer was questioning the islandness of Mumbai, maps by seafarers were giving Mumbai a definite form off shore, setting it on course to being a clear and distinct entity.
The English made an island much desired possession – as ‘Spots of Ground, still disputed to which side to incline.’

John Fryer in the 1670s referred to
In the two centuries that Mumbai evolved from disputable spots of ground to precious stone, drawing a line between land and sea with increasing accuracy in maps would become an obsession of the English East India Company, who in 1668 had rented Mumbai from King Charles II, thereby securing a base for their trading activities on the Indian subcontinent.

From at least the time of the Greek geographer, Ptolemy, in the second century the west coast of India was indicated by a line in European maps, and from the fifteenth century when Ptolemy’s map was reworked until well into the eighteenth century, this line took many forms in the works of different mapmakers. Like pieces of art, these maps did not call for comparison as much as individual attention. In the eighteenth century, however, art was displaced by a perceived need for accurate and knowledgeable representations of a coastline. The need to repeat voyage patterns year after year, and to make predictable visits to a series of ports, necessitated a formal knowledge of currents, coastlines and directions for sailing to them. The

John Thornton’s, *The English Pilot: The Third Book* (London: William Mount and Thomas Page, 1743), first published in 1703, was one of the first sea charts of the west coast of India. The subtitle of the book clarifies its coverage: ‘Describing the Sea-Coasts, Capes, Headlands, Straits, Soundings, Sands, Shoals, Rocks, and Dangers. The Islands, Bays, Roads, Harbors and Ports in the Oriental Navigation. Shewing the Properties and Nature of the Winds and Monsoons in those Seas; with the Courses and Distances from one place to another: The setting of the Tydes and Currents; the Ebbing and Flowing of the Sea. Also A New Table of Variations; and a Correct Table of Longitudes and Latitudes. With many other things necessary to be known. Being furnished with New and Exact large Draughts, of Ports and Islands, and Descriptions; gathered from the Practice and Experience of divers Able and Expert Navigators of our English Nation.’
East India Company pursued this line from both the side of the sea where it became an essential element of hydrographic or navigation charts, and from the side of land where it served as the limit of their territorial possessions in topographic maps, possessions that would gradually extend up and down the coast as the Company morphed from merchant to ruler. In the process they found that they could not look to the ‘native’ for a coastline. Francis Wilford in the late 1700s found drawings where ‘seashores, rivers, and ranges of mountains, are represented in general by straight lines. . .[L]ittle regard indeed is paid to truth. . . Geographical truth is sacrificed to a symmetrical arrangement of countries, mountains, lakes, and rivers, with which they are highly delighted.’ Reginald Phillimore, an authority on surveys in India in the colonial period concluded a century and a half later that native works had ‘no geographical value.’ Some scholars remain convinced that Indians visualised geographic space and that their maps have not survived. Yet it is possible (and it does not make them any lesser) that ‘peuples extra-européen’ as Admiral Francois Edmond Pâris referred to the seafarers of Asia whose boats he published extensively in the mid 1800s, did not need to see the coast in terms of a geographic line.

In the sixteenth and seventeenth centuries, makers of sea charts used observations and sketches from ship journals to constitute the line of the west coast, supporting their drawing of it with plans of harbours, elevation profiles of land, data of winds and currents, and instructions from experience of what to expect and look out for. It was a shift from communicating sailing directions of particular journeys via a verbal narrative accompanied by sketches of harbours, places of danger and ways to overcome them, etc., to the communication of a terrain where more than one route was possible, and furthermore, new routes could be devised. This beginning of drawing charts also laid the foundation for the chart being much more than a map. It is a drawing of cumulative experience, representing the accumulation of more observations than any one person could make in a lifetime. It is an artefact that embodies generations of experience and measurements.

Besides maps, the coastline was also drawn in sea charts which presented seafarers with a ‘ground’ to devise routes rather than follow them. These charts were centred on segments of coast. The Deccan Coast from Surat to Goa claimed its own frame. These charts which used observations and sketches from ship journals were supported with plans of harbours, profiles of land, data of winds and currents, and instructions of what to expect and look out for.
One of the first charts of the west coast in this regard was that of John Thornton. His *The English Pilot: The Third Book* published in 1703, covering the ocean from the Cape of Good Hope to the Moluccas, was the third part of a charting project of the global seas begun by John Seller in 1670. He draws heavily from the work of chart-makers of the Dutch East India Company but his drawings of the West Coast of India are believed to be original.26

Thornton’s work was reissued in a number of editions until 1761 when it was superseded by 'more up to date' charts like the *Orientale Neptune* of Jean Baptiste Après de Manneville and its English translation by William Herbert.27 The collection by Thornton,’ writes Herbert, ‘commonly called the English Pilot although deficient in many places, is much esteemed by navigators as it contains several charts of the coast in a large scale; nevertheless, the latitudes and bearings of many considerable places being very faulty, it requires to be corrected.’28 But Après de Manneville and Herbert’s charts would likewise become dated. This time, however, they would not be superseded; they would be displaced, as the source material of the chart in the late 1700s would change from mariners’ journals to actual measurements by surveyors, practitioners of the emergent discipline of marine surveying. The time of the sailor was past; it was now the time of the marine surveyor. ‘The Surveys of India,’ writes Clements Markham, ‘began along the coasts, and the sailors preceded the shore-going surveyors by nearly 200 years.’29

Marine surveying was slow to emerge. But once there, it did not just improve the drawing of the coastline, it also introduced a measure of accuracy by which improvement could be gauged. Mackenzie in his introduction to one of the first treatises on the subject (1779) writes:

Toward the end of the eighteenth century, professional surveyors took over from seafarers the task of providing the base material for maps and charts. They replaced the mariner’s observations with on-field measurements. In 1786 Lt. John McCluer was asked by the East India Company to carry out the first marine survey of the west coast. ‘I have begun,’ wrote McCluer, ‘with the Island and the Harbour, of Bombay, as if it never had been examined before.’

![Chart of Part of the Malabar Coast](https://example.com/chart.png)

John McCluer, ‘Chart of Part of the Malabar Coast,’ 1787; Galway’s Charts, Vol 1, Class 9, 135 (Library of Congress)
By the early 1800s the coastline held land’s edge firmly, and increasingly, accurately, to coordinates of geographic space. John Maclean in the 1870s saw it as ‘a precious stone set in the silver sea.’ This clarity of an ‘island’ owes much to the growing accuracy and standards by which geographic space was measured. But it also owes this clarity to land reclamation schemes which besides claiming land from the sea also sought to remove any ambiguity in the meeting ground of land and sea.
Drawing the coastline also gave Mumbai a firm place off the mainland. This task was aided by the Great Trigonometrical Survey. It measured not just the edges of an island and the mainland, but the space of the water between them.
The coordinates of the GTS were applied to nautical charts, which situate hydrographic information more accurately on the earth's curvature than earlier sea charts. These charts presented the west coast in sheets, one of which from 'Arnola Island to Kandheri Island' covers the coast where John Fryer once sighted Mumbai amongst 'Spots of Ground, still disputable to which side to incline.' It had taken two centuries to fix Mumbai with geographic precision.
space; if any doubt arises, let them repeat their Observations in such Part, that an implicit confidence may be safely placed in their work when finished. The project was undertaken by Lt. John McCluer. For him it was a new beginning. 'I have begun,' he wrote, 'with the Island and the Harbour, of Bombay, as if it never had been examined before.' He carried out what was asked of him, but he also drew a line where sea met land. It was a considerable abstraction for this meeting took many forms depending on levels of the tide, levels that differed at any given time from place to place and at any given place from time to time.

McCluer initiated a tradition of surveys of the west coast. Carried out at intervals these surveys use increasingly sophisticated technologies to plot a line that appears to defy capture on paper, a line that changes with daily, seasonal, and occasionally, catastrophic actions from the side of both land and sea. 'Two influences, sea encroachments and land reclamations,' it was observed in the Gazetteer of 1882, 'have for centuries been changing the lands along the coast.' This, however, did not and does not discourage surveyors; it gives them a cause.

Half a century after McCluer began his survey, the coastline that he drew was reinforced from the other side by the Great Trigonometrical Survey of India (GTS). If McCluer drew the coastline in itself, the GTS would do so in relation to the curvature of the earth, which it would compute in the process of a 'mathematical survey'. William Lambton who began the GTS, promised in his proposal to the East India Company, that his survey would not just measure distances and correct them for curvature with observations of the stars, which is what McCluer and other surveyors at the time did.

The accurate representation of the West Coast of India by surveyors in a post GTS era would become commonly visualised through the publication of topographic maps of quadrangles by the Survey of India and educational atlases that spread maps as the basis of 'useful knowledge.'
Instead, it would determine the exact position of all the great objects that appeared best calculated to become permanent geographical marks... because when these points are laid down in the exact situations in which they are upon the globe, all objects of whatever denomination, such as towns, forts, rivers, etc., which have a relation to those points, will also have their situations true in latitude and longitude. His project, which began tentatively in Bangalore in 1800 but more assuredly in Madras in 1802, would extend like a web across India. It reached the Colaba lighthouse in 1837 via the Bombay Longitudinal and would extend north and south along the coast, providing the 'permanent' points from which the coastline would be measured and drawn.

The GTS clarified the coastline as a meeting of two data: one horizontal, the other vertical. The horizontal datum was articulated in terms of latitude and longitude. The vertical datum was depicted by the mean sea level of India, an averaging of the mean sea level at nine points on the coast of the subcontinent. Together these data defined a terrestrial and territorial edge in geographic space.

Maps take a view from above, presenting Mumbai as a land form: a 'trapezoid,' 'an outstretched, grasping hand, reaching westward into the Arabian Sea' or a 'withered leg.' It is a view that can be and has been embellished with fine detail of property lines, land uses, hachures or contours, and entities such as water bodies, trees, roads, buildings, villages and cities which can be drawn in plan as islands within islands. It is also a view by which changes in land form can be plotted over time. But the sea in this view has little to say, presenting itself as an undifferentiated surface beyond land's edge.
Here, the Mithi, which carries more than an alternative visualisation of Mithi that exits land through a coastline, which carries the possibilities of its past and its future.
The articulation of a line between land and sea has largely gone unnoticed. It was a taken-for-granted visualisation in a milieu of colonial power and landed property. Today, it is deeply embedded in everyday language and an intrinsic part of imaging Mumbai and imagining its future. Questions have been raised regarding the form of this line from the time Mumbai was occupied by the English. More recently, the purpose and enterprise of its drawing have been discussed. But little is said about its presence, about the battlefront that it sets up between land and sea and between land and water in general, which in Mumbai, includes the monsoon.

Uncritical acceptance of the line between land and sea has brought Mumbai the flood of 2005. More than just a failure of a drainage system or a failure of planning and administration, this disaster is a failure to visualise a terrain that just beneath a surface, which maps show as starkly divided, is today as it was in John Fryer’s time, fluid and dynamic. Here, the Mithi, which carries much of the blame for the flood, offers an alternative visualisation of Mumbai’s terrain. Rather than a river that exits land through a coastline, it is Mumbai’s estuary, a third coast, which carries the possibility of a different reading of Mumbai, its past and its future.
Mumbai in a colonial era paid much attention to two coasts: the seafront on the west, a face which it shares with the West Coast of India; and the harbour front on the east, which separates it from the subcontinent. It is a belonging and separation that makes Mumbai even today sit uneasily between an 'Indian city' and a 'city-state.' A columnist in a weekly recently put it this way: 'Bombay gives a sense of being a supercharged power boat precariously moored to the rest of the country from which, at any moment, it might burst free and zoom away into a mythic horizon of its own making.' It helps that both coasts are emphasised by north-south ridges of rock outcrops, less so today as many of these outcrops have been levelled. But they provide Mumbai with a choice of views: on one side a sea face that looks upon the Arabian Sea illuminated at sunset and on the other, a waterfront that gazed at the workings of an exotic harbour seen against the distant hills of the mainland.

A third coast to the north, between Worli and Sewri was of a different order. Its waters were never considered picturesque enough to situate at a distance and furthermore, the meeting of land and sea was more difficult than usual to tell. Neither open sea nor harbour, these waters were a more ordinary presence. In the early years of English occupation they functioned as a boundary with the Portuguese on Salsette. But for centuries before that and until the early 1800s, these waters afforded a passage through a labyrinth of creeks until crossing them became more important than traversing them, and they were transformed with causeways and landfill into the Mithi river flowing into Mahim Bay and the Mahul river running into Mumbai Harbour. As much as the two other coasts were appreciated in themselves, this coast has always been a means to an elsewhere.

Mumbai, it was said at the zenith of British imperialism, was 'the great western gate of India through which trade and civilization pass.' It was celebrated as such with the building of the Gateway of India in South Mumbai in the early twentieth century. It is a title that Mumbai took from Surat and Goa, two places that far exceeded it as gateways to the subcontinent in the sixteenth and seventeenth centuries. Yet Mumbai is just another moment on a coast that in its everydayness has always been more porous than divided. It is in keeping with an estuary which, particularly during the monsoon when there is too little time and too much water to make an orderly exit through courses delineated on maps, is more continuous along the coast than restricted to the mouths of rivers.
In this largely hidden, and to an extent, lost coast of Mumbai can be glimpsed a different meeting ground of land and sea, a meeting of movements. The closer one is to the surface, the more this terrain reveals its openness and the more diverse the materials that pass through. Besides boats and people, these materials include deposits coming off an eroding land and those coming in with the tide of the sea. It is a world of stuff that cannot be held to a simple gradient whether of slope or salinity.

To geographers this is an estuary, a place where the fresh water environment of rivers transition to the saline environment of the sea. It is a ground for a unique ecosystem. On the west coast, however, an estuary is far from restricted to the mouths of rivers especially during the monsoon when there is too little time and too much water to make an orderly exit through courses delineated on maps.

At times like this when the coast is a continuum of flows that are too numerous to count and to name, the meeting ground of land and sea is less a north-south line that divides and more an east-west filter that accommodates movements both ways.

This extended estuary challenges maps which relegate the sea not just to a place beyond land’s edge but also to a surface that lacks differentiation. Maps show it devoid of content, a void crisscrossed by abstract lines of latitude, longitude or wind directions, a place for titles, script and illustrations of ships and creatures of the deep. As Lewis Carroll in The Hunting of the Snark astutely observes, the sea when seen ‘Without the least vestige of land’ that gives other maps ‘shapes, with their islands and capes’ draws ‘A perfect and absolute blank.’

In this largely hidden, and to an extent, lost coast of Mumbai can be glimpsed a different meeting ground of land and sea, a meeting of movements. The closer one is to the surface, the more this terrain reveals its openness and the more diverse the materials that pass through.
Mariners like Captain Henry Cornwall in the early 1700s documented the porosity of the west coast. His effort to familiarise himself and other seafarers with a coast began as a horizon that rose from the depth of the sea, became an elevation before extending in plan as he moved into land. His drawings were transitions in representation as much as they were transitions in ground from sea to land.
‘I must also strenuously recommend, to the expert Navigator,’ writes Alexander Dalrymple in his Essay on Nautical Surveying (1771), ‘to omit no opportunity of taking Views of the Land. It is obvious no plan can be well constructed without having a View of the Land, at least in the mind’s eye; and therefore much better to have it recorded an always present to refer to.’
The horizon that transitioned to plan in drawings of the coast by those like Henry Cornwall would give way to plans alone, sometimes with sections taken at critical points. The separation of plan from horizon further enforced the growing acceptance of a divide between land and sea that would make the coast more of a dividing line than a zone with movements across. However, in the mid-1700s seafarers were still more interested in knowing the openings into Mumbai, which they marked with measurements of depth called soundings, than in seeing a coastline. There were five such openings documented by surveyors of the East India Company: Vasai, Manori, Versova, Mahim, and Mumbai. But there were and continue to be numerous other openings in between traversed by boats and material that did not get their own plan but were rather absorbed directly into the surveyor’s coastline.

2. Plan of Manchora River in the Island of Salsel by Archibald Blair, 1777.

3. Plan of Vassava by Lt. Edward Harvey, 1777.

4. Plan of Mayham, surveyed in 1777 by Lt. Edward Harvey.


1. William Nicholson, 'A Plan of Bombay Harbor, on the Coast of Malabar. Shewing the true Situation of all the Rocks, Sands & Shoals, with the Marks, to Avoid them. The true setting of the Tides, the Times of High Water with the Depths at High & Low Water, Likewise the Marks for the Best Anchoring Grounds, and all other necessary Directions, etc.' 1794, in Laurie and Whittle, Complete East India Pilot, 1804, 59 (Library of Congress).


Instead of the view from above, the west coast demands to be seen in sectional-depth, a representation that was and is appreciated by seafarers who do not take a position above or for that matter embrace the measure of geographic space which maps celebrate. When out of sight of land they turn to a world of time operating within a celestial sphere rich in distinguishable moments rather than measurable distances; and they turn to a world of depth, which they read in sectional terms rather than in plan. Here where space has no presence [perhaps because it is omnipresent] and surface is not readable except in depth – through rises, waves, soundings, and creatures – terrain is felt more than it is seen. To approach land is to feel depth rising above the horizon. But for a long while in their approach seafarers inhabit a transition from sectional-depth to plan-surface, from time to space, and from a world marked by a horizon that can only be approached to one of boundaries that by definition assume an ‘other’ side.

This transition from sea to land is not a logical one. There is little if any common ground between time and space, depth and surface, horizon and boundary. These are qualitatively different measures that sit uncomfortably with each other. Instead of a common ground there is a negotiated unease, an analogical tension that keeps land and sea alive through practices that respect their difference.

While the plan view of the map celebrates the islands of Mumbai and situates the sea beyond land’s edge, sections reveal a sea that is beneath, within, permeating land through aquifers well known to offer Mumbai citizens ‘brackish’ water far inland. Here landfills, causeways and walls do not keep the sea out; they merely prevent it from surfacing in a game of pressure, saturation and porosity that is played in depth. In this estuary, the flood of 2005 did not come from just rains from above and flows on the surface; it came as much from a saturated and permeated ground beneath.
These practices are visible in Mumbai today beneath the surface of maps and beyond the eye of those who rely on maps, in ordinary everyday landscapes that elude visual clarity while exercising the tenacity and negotiating sensibility of the estuary. These are landscapes, which in a world of the coastline, are looked upon as either informal or lacking urbanity. In an estuary, however, the appreciation for divergence and accommodation of ambiguity that these landscapes cultivate is an opportunity to rethink the measures and possibilities of design in Mumbai.

This transition from sea to land is not a logical one. There is little if any common ground between time and space, depth and surface, horizon and boundary. These are qualitatively different measures that sit uncomfortably with each other. Instead of a common ground there is a negotiated unease, an analogical tension that keeps land and sea alive through practices that respect their difference.
In the century following the arrival of the English East India Company in the early 1600s, the west coast of India between Surat and Goa was a particularly active ground for ships of various kinds. Some ships found stability in land, in harbours of territorial possessions. Many, however, preferred to remain loose at sea, seeing the world not in territorial terms, but as a field of points with which to trade, plunder, visit or avoid. It was an ephemeral network of momentary contacts that extended inland as it did out to sea. On the other hand, to those who found stability in land, the sea was beyond land’s edge and the ship was not a point in itself as much as a means of transport across the sea. This view, which makes a firm divide between land and sea with the drawn line, reduced those who held on to an ephemeral network of points to nomads who operate either as traders or pirates. The coast between Surat and Goa had an unusually large presence of both during the time that the English were consolidating their territorial possessions in the nineteenth century, but they chose to highlight the latter, calling it the ‘Pirate Coast’.

Drawing the line of the coast created a transgressor, but it also erased one of Mumbai’s origins, one that reveals it as a field of points in a network of momentary contacts and transactions. It is a terrain that Mumbai inherited from Mahim, a name that was once prominent on the west coast, but is today a neighbourhood within the city.

Mahim is not among the origins that jostle for attention in Mumbai today. The focus in this regard is on a house and a temple, places that have to do with Mumbai’s self image as a city and an island, respectively. The house, on the harbour-front of South Mumbai, was described by Fryer as ‘a pretty well Seated but ill Fortified House’ with ‘a delicate Garden, voiced to be the pleasantest in India, intended rather for wanton Dalliance, Love’s Artillery, than to make resistance against an invading foe.’ It once belonged

The language of ports was well captured by portolan charts. The rhumb lines of these sea charts, which allowed mariners to set course from port to port across open sea, did not stop at a coast, but extended inland. They were sea-centred. They did not have as modern maps do, a common scale, making space a less important factor in the complexity of positioning at sea, certainly less important than origin and destination.
to Garcia da Orta, the famous naturalist and physician and later to Dona Ignaz de Miranda, 'Lady of the island', at the time the English took possession of Mumbai. The English made it a 'castle' and in the 1700s built a fort around it, which, today, is conserved as the city's origin and recognised as its historic core. The other origin is rooted in the temple of Mumbadevi, the 'goddess of the island of Mumbai' worshiped by the Kolis who are believed to be the 'original' inhabitants of the island. It stood in a coconut grove that was consumed in the mid-1700s by the Esplanade and was rebuilt in the 'native town' soon after. It acquired the full recognition of an origin in 1995 when the English name of the island and city was changed from Bombay to Mumbai. Both these origins are well known and celebrated while Mahim in their shadow goes relatively unnoticed.

To the Portuguese, Mahim was another island in the archipelago that Viceroy de Mello de Castro did not want to hand over to the English. Humphrey Cooke though, saw it differently. To him, Mahim was the better side of Bombay Island. 'Maim,' he wrote to King Charles II, 'is the best part of this island, and they think it too good for our Kings Majesty.' The East India Company even declared that Mahim was the former name of this island. Within this Haven or Bay stands the Island of Bombay, which gives Title and Denomination to the whole Sea that enters there . . . On part of the Island of Bombay stands Mahim, the Name formerly of the whole Island. There was in old time, built here by the Moors, a great castle; and in the time of the Kings of Portugal, this was the Place where his Court and the Custom-house was kept, and here were the Duties paid by the Vessels of Salset, Trombay, Gallian, and Beundy on the Main, etc.'

By this assertion, the Company believed that King Charles and therefore the Company, 'became unquestionably entitled, among other things, to Bundura, Trombay, Marversova, and other Places lying on or adjoining to the Island of Salset, and to Caranjah, with other islands and Places lying near to or in the Harbour of Bombay, as so many Members, Territories, or Appendants to Bombay.'

Rhumb lines gave way to lines of latitude and longitude in maps of the eighteenth century and the coast from a field of discrete points or ports would become an accurately measured coastline dividing land from sea, geographically demarcated property from open horizon. This coastline would also cast off the seafarer into a nomadic world, none more emphatically than the line between Surat and Goa which James Rennell, a pioneering land surveyor and mapmaker, drew in his landmark map, *Hindoostan* (1782) as the *Pirate Coast*. 
This reading of a name as a port rather than an island suggests a different expectation of the transfer in 1661. It was expected to include Mahim's 'Title and Denomination to the whole Sea that enters there.' What was handed over instead as Samuel Pepys, Secretary to the British Admiralty at the time, noted in his diary was 'but a poor little island; whereas they made the King and Lord Chancellor, and other learned men about the King believe that that, and other islands which are near it were all one piece; and so the draught was drawn and presented to the King.'

This Mumbai, however, cannot be easily clarified in maps for it is less about territory and more about a web of commerce, a bazaar, where geography is blurred by relations of economy, by movements of goods that are often mysterious and unknown in a competitive and opportunistic world. It was a fear of losing this bazaar — which literally meant 'the whole sea that enters there' — that probably prompted de Mello de Castro to write to his King to buy Bombay back: 'I confess at the feet of your Majesty that only the obedience I owe your Majesty as a vassal could have forced me to this deed (i.e., the cession of Bombay), because I foresee the great troubles that from this neighbourhood will result to the Portuguese and that India will be lost on the same day on which the English nation is settled in Bombay.' This statement is prophetic. But more than prophetic, it suggests a different reading of a name in a map at the time. Names in maps, de Mello de Castro seems to warn, do not necessarily allude to geographic entities within geographic areas; they could more seriously refer to strategic and tactical operators in an open field, operators that change the space they 'occupy' with each transaction they make. Indeed the controversy between de Mello de Castro and Cooke was not necessarily about the island of Bombay, a territorial entity; it was more likely about the port of Bombay, an economic entity,
which threatened to be the new command point with the potential to take over Mahim's relations and contacts. Hence the viceroy did not want to give up Mahim. His effort, though, was in vain.

Little attention is paid to this legacy of Mahim in part because Mahim is not seen as Mumbai's ancestor. It is rather known as a locality in Mumbai, one of the original islands of Heptanesia. Historians say that Raja Bhimbdev in the thirteenth century 'found Mahim a desert island washed by the waters of the western sea and sparsely peopled... and there he built a city which he called Mahikavati whence the name Mahi or Mahim has been derived. There too he built his palace and a great temple to his family goddess, Prabhadevi.'¹⁰ This island became a seat of Muslim rulers and at times an outpost of rulers on the 'mainland', the place of the saint, Maqdom Mohammad Mahimi. In 1509 this island was plundered by the marauding Portuguese. 'On arrival at Mahim, on the 21st January, the people terrified at what had taken place at Dabhol, fled from the fort to the mountains, and the fleet was therefore enabled to land for wood and other supplies without opposition. After this the expedition went on to Diu.'¹¹ Indeed given its prominence in early accounts there is good reason to believe that it is Mahim (also called Moyambu and Mombaym by the Portuguese) rather than Bombay, as is popularly believed today, that was referred to in 1530s as 'a ilha da boa vida' which the Portuguese admiral and later Viceroy, João de Castro described in 1538: 'The land of this island is very low and covered with great and beautiful groves of trees. There is much game, and abundance of meat and rice, and there is no remembrance of any scarcity. Now-a-days, it is called the island of the good life, a name given to it by Heitor da Silveira, because when his fleet was cruising on this coast, his soldiers had great refreshment and enjoyment there.'¹² Castro could also be referring, as Cooke would a century later, to the better side of the 'Island of Bombay or Mayam, which,' he writes, 'are the same.'¹³

Yet, it is not Mahim the island that calls for attention, but Mahim the port, which commanded the open and mysterious terrain of the bazaar. This Mahim was well noted by cartographers and commentators before Mumbai made its appearance on maps, at a time when separating land and sea was not taken for granted; when places on the west coast were still points of commerce with mercantile rather than territorial ambitions; when Mumbadevi and Prabhadevi were shrines that commanded open horizons and not merely islands. Bombay inherited this Mahim when Cooke claimed it against the wishes of de Mello de Castro.
Drawing the line of the coast created a transgressor, but it also erased one of Mumbai's origins, one that reveals it as a field of points in a network of momentary contacts and transactions. It is a terrain that Mumbai inherited from Mahim, a name that was once prominent on the west coast, but is today a neighbourhood within the city.
But little attention is paid to the legacy of Mahim also because Mumbai does not see itself in a bazaar. It rather sees a bazaar within itself. Mrs Postans, who observed ‘two large bazaars in the Fort, the China and Thieves’ bazaars’, and three ‘burrah bazaars’ in the ‘Native Town’, explains this reading of the bazaar within. The word Bazaar, conveys a widely different idea to the inhabitants of the east and west. To a European, it expresses an emporium of varied articles of elegance and taste; the resort of the idle, the beautiful, the gay. The Asiatic understands by it a heated dusty road, lined with open shops devoted to traffic, and crowded by the dense population of a native city, together with the strangers that are within its gates. Either way the bazaar within commanded a place on maps of most Indian cities in the nineteenth century. In Mumbai, it lay within the Bazaar Gate of the fort, ‘a long and crowded bazaar amply stocked with every kind of merchandise. Many of the rich natives have their

habitations in the bazaar, residing in large mansions built after the Asiatic manner: but so huddled together as to be exceedingly hot and disagreeable to strangers unaccustomed to breathe so confined an atmosphere.’ Today, the term is used for markets in the city that are distinguished by non-formal qualities of a ‘bazaar economy,’ an economy that generally operates by a great number of small and isolated person-to-person transactions conducted through a multiplicity of small enterprises. Bazaars tend to appear as places of ‘chaos and apparent disorder’, but some argue that they serve a purpose, not least in cushioning the entry of the rural migrant to the city. The bazaar ‘symbolises energy, optimism and a will to survive outside the formal system,’ write Sharada Dwivedi and Rahul Mehrotra. They coin the term ‘bazaar city’ and invoke the image of ‘bazaars in Victorian arcades’ to visualise the contemporary Indian city in general and Mumbai in particular, not as a polarity of
formal and informal but a unique entity of ‘two worlds’ that cohabit a common urban space.

While the bazaar can be put to the service of the city, as a marketplace or an informal world, it is, on a more fundamental level, antithetical to the spatial representation that accompanies the city: a representation that articulates the city as a geographic area upon which it is difficult not to exercise knowledge in whole or part and a desire for control such as through a ‘city plan’. The bazaar instead demands to be represented in terms of transactions that extend momentarily and largely invisibly. As such, it does not present itself as a whole over which there can be authority, but in glimpses of a labyrinth where one is called to participate by creating, deflecting, enhancing, or diminishing transactions. The bazaar, in other words, is a practice more than it is a place. This was the world of Mahim, the port, before the English drew the Pirate Coast. Today it is the world of Mumbai.

This Mumbai, however, cannot be easily clarified in maps for it is less about territory and more about a web of commerce, a bazaar, where geography is blurred by relations of economy, by movements of goods that are often mysterious and unknown in a competitive and opportunistic world.
In the shadow of two celebrated identities of Mumbai – city and island – a third identity goes relatively unnoticed. It has to do with Mumbai, the port. The origin of this identity points beyond the reputed Mumbai Harbour to Mahim, a place which the Portuguese strove to keep from the English in 1661. It commanded a bazaar that reached across the sea on the west and through the labyrinth of an estuary on the east. Its name, which once had greater reach than Mumbai, referred to a strategic and tactical operator rather than a geographic entity.
AQUEOUS TERRAIN

3.0

3.1 CREEK FORTS
3.2 NULLAH CROSSINGS
3.3 MONSOON SURFACE
AQUEOUS TERRAIN

Design in an estuary must begin with a new visualisation.

The view from above that is deeply embedded in professional practices has privileged land (and island) over the waters of an estuary and in the process marginalised the sea and monsoon, both of which are made to appear as outsiders where they are insiders. As such, the flood of 2005 (and the rise in sea levels expected over the next decades) demands more than analyses and solutions; it calls for a change in the way Mumbai’s terrain is seen. This is the purpose of the third section of Soak. It changes the primary vehicle of visual representation of Mumbai from plan to section. Here boundaries are replaced by horizons, depth matters as much as surface and landscapes like the oarts, swamps, talao, and bazaars are read not as landuses that claim boundaries and difference, but practices that accommodate fluidity and openness.

To give up the view from above is not easy. It provides planners and administrators not only with a literal overview, but also a miniaturised world that appears within their grasp and perhaps control. ‘All the complex mental abstractions, that you and I have to make as we move around our city at ground level, are immediately explicit’ to those with a view from above, writes architect and city planner Charles Correa in an introduction to a recent book on aerial views of Mumbai. It is a vantage point from where to see problems, he claims, but also one from where it is ‘almost impossible not to take the kind of holistic overview so essential to administering a city.’ It is this overview that underlies the government master plan underway in Mumbai to resolve flood. This plan aims to keep monsoon waters between two lines with the help of concrete walls and facilitate, as these lines do on maps, their exit from land into the sea.

Mumbai in an estuary requires undoing three centuries in which the ‘complex mental abstractions’ of the map and plan have become the virtual (and simplistic) basis of planning and administration. It calls for the view at ground level with all the hardship that it now takes to see land and sea on a continuum in section, in movement and in time. This view, which once came easily to seafarers, undoubtedly continues to come to many ordinary inhabitants of Mumbai who with their landscapes elude the world of the map.

What follows in this section of Soak are proposals for the terrain of the Mithi, which extends from Sanjay Gandhi National Park in the hills of North Mumbai, across a surface consumed by settlement that is more defiant than obedient, to the realm of historic forts that once commanded the flows of Mahim Creek. These three staging grounds of the Mithi are each a place for a distinct set of design interventions – Creek Forts, Nullah Crossings and Monsoon Surface. These interventions do not work toward end scenarios. They are rather seeds with the potential to unfold and extend possibilities in more than one way, surviving opportunistically with agility and tenacity like the landscapes of Mumbai. They work with an appreciation of the fact that design in an estuary, particularly an estuary in the monsoon, solves the problem of flood not by flood-control measures, but by making a place that is absorbent and resilient.
The substance of the Mithi is too fluid to draw in maps. Cartographers draw the edges of land along it, edges that hold a void in the city’s fabric for stuff to flow through and for bridges, causeways, pipelines, ferry tracks, and even a runway of Mumbai’s airport to cross. It is a view of the Mithi that is embraced by administrators, engineers and planners who then logically resort to enforcing and reinforcing the edges of this void with physical and regulatory walls to facilitate an unencumbered flow within it. This is the Mithi as a river, a carrier of monsoon water and other unwanted matter of settlement to the sea. It is the entity of the map and, by extension, the master plan underway to solve the problem of flood in Mumbai.

The Mithi as a nullah is a different being altogether. It derives from one of Mithi’s ancestors, the Gopar. Contrary to the common use of the term nullah to mean drain, the Gopar was not a void but an open field. It was not held by sides to a flow but by bunds or embankments to overflows. These levelling devices across swales were low to hold water for short stretches as in rice terraces and they were high to hold water over long distances as in tanks. If the Mithi River gives priority to its link and continuity with the sea, rendered as it is with the same blue as the sea in maps, the Mithi Nullah gives priority to holding waters on land. The latter was not looked upon kindly by British administrator, P.J. Mead. Reporting on the possibilities of developing Salsette as a residential area of Bombay in 1909, he describes the plains of Salsette as a tract ‘pitted with tanks of various sizes both natural and artificial. Rice embankments, which occupy nearly all the level low-lying ground, further impede natural drainage.’4 It is not the holding operation of the embankment that draws the administrator’s attention; it is rather their holding back of a flow presumed ‘natural’ that concerns them.

The identity of the nullah hinges on the operation of devices that hold monsoon waters. When seen individually these embankments are simple structures built to allow a spillover at a certain height. Seen collectively and in operation, however, they activate a surface that gathers and dissipates with a complexity and temporality that beguile the eye. Their working does not form a line from source to sea that passes by
fields and through settlements as a river does; rather it forms the field of settlement itself. If the Mithi River encourages crossings that have as little engagement with a void as possible, the Mithi Nullah instigates crossings that are necessary to its ground of holdings and overflows.

The five projects in this section are each associated with a cluster of crossings of the Mithi: Mahim, Sion, Vakola, Airport and Aarey. Rather than acknowledge these crossings as connections across a void, these projects appreciate them as grounded in a field that can be cultivated and calibrated to filter, treat, absorb and harness the waters of the monsoon as well as the dominantly grey waters of residential and industrial effluent coming to the Mithi through the year. This cultivated ground is a starting point for these projects. Each of them extends from it with operations that similarly treat the swales coming into the Mithi from either side, swales that are largely accepted today as drains. These extensions eventually do not have to distinguish between surfaces of earth and buildings that led and continue to lead surveyors to divide architecture from landscape in maps. Instead it brings building into the field of cultivation, calling them to a different responsibility as part of the ground of a nullah. Each project responds to particular opportunities in its place and in the way of its extension. Together they work to recover a surface of holdings that has been lost in a city separated from the monsoon with the articulation of a drain that exists merely to facilitate the exit of rain and other matters to the sea.
NULLAH CROSSINGS

PROJECT 6 MAHIM CROSSING

PROJECT 7 SION CROSSING

PROJECT 8 VAKOLA CROSSING

PROJECT 9 AIRPORT CROSSING

PROJECT 10 AAREY CROSSING
By the 1770s, the possession of Salsette was deemed a necessity, a matter of survival for Bombay Island. The Court of Directors and the Bombay Government, write the authors of the 1882 *Gazetteer of the Bombay Presidency* of the scarcity felt a century before, 'agreed that, without the possession of some of the neighbouring lands, Bombay could not be held. The most suitable lands were Salsette and Bassein, Salsette for its rice and vegetables, Bassein for its timber. No chance of gaining these lands was to be allowed to pass.' Two decades after taking Salsette by force from the Marathas in 1774 the administration ordered the construction of the Sion-Kurla Causeway across Mahim Creek. They did not heed warnings of the impact that this would have on the movements of the sea and monsoon waters. Crossing Mahim Creek was far more important for the immediate and everyday survival of Bombay Island than the creek itself, which at that stage was not only carrying the sea through to Thane and Mumbai Harbour but also, as some saw it, deflecting fluvial deposits brought down by the Ulhas and Thane Creeks that would otherwise silt up the harbour. It also, according to the Custom Master of Mahim, allowed the passage of 400 boats (Bortilas, Shybars, and other boats') each non-monsoon month. 'Those bound for Bombay are chiefly laden with grain of all descriptions, ghee, cotton, Pieces Goods, cloths, Timber, Batty, etc. and...those bound to the Mahratta ports are chiefly laden with dried Fish & Coconut from our fisheries of Manooray, Versovah on Salsette, and from those of Worlee, Danda, Mahim, Daravah, Sion & Sewree on the River.'

The causeway was completed in 1803, doubled in width in 1826, and paralleled in the early 1850s by the first rail track in India between Mumbai and Thane. It divided a surface into two flows – the Mithi River toward Mahim and the Mahul toward Sewri. Each flow was reduced to negotiating a single meeting ground with the sea, a single sea level in an estuary marked by variations in level not by tide alone, but also by conditions of slope, edge and currents of an open ocean. In short, the causeway took away the choice enjoyed by overflows of meeting the sea at more than one place and at more than one level. It was a loss of resilience more than a thoroughfare.

The choice, however, is not lost all together. While Mahim Creek is disrupted by sitation and landfill that has extended far beyond the 1800 causeway, the overflow surface of a nullah can still be cultivated opportunistically, through infrastructural cracks and temporal appropriations to link the Mithi with the Mahul. To this end the Sion Crossing Project uses the Sion-Chunabhatti-Kurla railway corridor, the maidans on the Eastern Expressway, the ground beneath high tension electric lines, and existent drains to recover the resilience evident in a choice of sea levels. This web of links, which expands and contracts as required, is an opportunity to introduce a program of temporal appropriations. It is also an opportunity for an infrastructure of biotic treatment fields, tanks, oarts and walls along the railway corridor to serve, on the one hand, as critical dividers, and on the other hand, as energy and water collectors and providers of services and occupiable space that can be used for facilities on either side.
ANK gathering people visiting waters fish celebrating festivals everyday rituals occasions treating

OART MANGROVES cultivating / cultivating harvesting / experimenting protecting

CREEK barge thoroughfare mangrove gradient connecting Mahul with Mithi

PLACE

01. central rail corridor
02. lax bahadur shastri marg [agra road]
03. central rail [sion line]
04. eastern expressway
05. central rail [harbour line]
06. nature park
07. bandra kurla complex

08. sion-dharavi sluice
09. swadeshi mills
10. chunabhatti maiden 1
11. chunabhatti maiden 2
12. sion maiden
13. chunabhatti station

GROUND

ARMATURE

NOTATION
EPILOGUE

Estuary in the monsoon

Three centuries after English administrators pictured a ‘city on an island’ – a city which by God’s assistance is intended to be built,’ as Governor Aubinger declared in the late 1600s, a small group of individuals through a 1965 issue of the journal, Marg, visualised a ‘city on the sea’. Mumbai, they said, ‘can only be the splendid city it once was, if it regains its character as a city on the sea.’ Concluding that ‘the island of Bombay, already near saturation point, cannot possibly absorb the increase of traffic and population expected in the next 15 years,’ they proposed a twin city on the mainland. It solved ‘the pragmatic problems of transport, housing and so forth’ of the existing city, they argued, but it would also turn the city from its north-south axis to an east-west one, opening up the possibility of ‘new waterfront plazas facing the harbour.’ Since then Navi Mumbai has come up on the mainland across the harbour and initiatives continue to be made to strengthen the east-west axis in the face of a growth trajectory that refuses to entirely abandon the north-south axis of the Island City. Today, Mumbai may not yet be the City on the Sea expected by the twentieth century visionaries, but the era of the Island City is surely over. There is too much connective tissue between island and mainland via rails, roads, pipes, wires, airways and waterways not to mention the flows of immigrants that tie Mumbai more strongly than ever to various parts of India.

However, four decades after Navi Mumbai was proposed on a map, the Flood of 2005 signalled the need for a new visualisation. That event was not just water causing havoc on land in Mumbai; it was water erasing lines that divide land from water, lines conceived on a drawing board by surveyors in ‘fair-weather’ and made hard in the landscape and in the imagination of Mumbai’s citizens over three centuries. It calls into question the plan-view that privileges boundary over horizon, space over time, surface over depth, land over water. It draws attention to the need to visualise Mumbai as neither a city on an island nor a city on the sea; but a terrain in an estuary and furthermore, an estuary in the monsoon. Here the firm line of land’s edge is a gross simplification in a fluid world where land and water are not separable as they can appear to be for a moment on the surface but rather woven intricately in a complex and temporal depth. In short, Mumbai in an estuary demands to be seen in section more than plan.

Anthropologist, Clifford Geertz, recounts an ‘Indian story’ that could very well be situated in this new visualisation of Mumbai. It is about ‘an Englishman who, having been told that the world rested on a platform which rested on the back of an elephant which rested in turn on the back of a turtle, asked what did the turtle rest on? Another turtle. And that turtle? ‘Ah, Sahib, after that it is turtles all the way down’.” For Geertz the story captures the incomplete nature of understanding, ‘in which to get somewhere with the matter at hand is to intensify the suspicion, both your own and that of others, that you are not quite getting it right.’ Others have not taken as kindly to the endlessness of the turtle chain in the story. To Stephen Hawking, the idea of an infinite tower of turtles is a denial that the underlying order of the universe is within human grasp: ‘our goal is nothing less than a complete description of the universe we live in.’ Henry David Thoreau, before him, read the story as the absence of truth, of men ‘one leaning on another and all together on nothing; as the Hindoos made the world rest on an elephant, and the elephant on a tortoise, and had nothing to put under the tortoise.’
What is missed in the appreciation and depreciation of this ‘Indian story,’ which is retold in many different ways in Europe and America by those in the business of discussing things like first cause and truth, are the animals in the story and the sectional world that they inhabit: the turtle beneath the elephant; a reptilian world beneath a mammalian one; and perhaps the marine-coastal world of the five species of turtles known to inhabit the seas around India (four off Maharashtra) supporting the terrestrial one of the Asian elephant. In India, particularly in the monsoon world of the west coast and even more particularly in the Mumbai that came across to John Fryer in 1673 as ‘Spots of Ground, still disputable to which side to incline’, it affords another reading of the terrain of settlement. This terrain is not land divided from water, but an ambiguous and mysterious depth that reaches from monsoon clouds above through the labyrinthine world of creeks, to the web of aquifers beneath. It is not a spatial ground as much as a temporal one. Here building concrete walls to channel monsoon waters and barriers to keep out the sea, both of which are practices geared to prevent waters crossing a line, are out of place. Waters in a sectional world do not flow on a surface as much as they rise and fall, evaporate and condense. They do not flood; they soak.

If Geertz is right in calling the turtle tale an ‘Indian story’, then imaging a sectional world stems perhaps from an Indian imagination that paralleled an English administration and today, parallels a cultivated Indian administration preoccupied with making Mumbai in the image of a map. Indeed Mumbai in an estuary dislodges the image of the map that underlies the City on the Sea as it did the City Island, an image produced by men who avoided ‘seeing’ during the monsoon because in this ‘foul weather season’ the ‘truth’ of the lines that they wanted to see was lost to an unknown depth of turtles. They chose instead to image the world in fair weather when land’s edge was less obscured by water. But this was difficult enough for they had to hold the sea to a level in time in order to plot a firm line. However, their conceived ‘truth’ has become the taken for granted ground of Mumbai – the basis of describing place and designing its future.

Soak is a call to reinstate the world of the turtle; to reimage the waters that surveyors find too fluid on the surface to draw meaningfully on maps, waters that are yet vital in depth. This is particularly the case on the west coast of India where life is sandwiched in the dynamic world between annual monsoon clouds and a perennial sea. Today, however, it is more generally the case on all coasts where the sea with its projected rise caused by global warming threatens to inundate vast areas that maps have assured people are not the realm of the sea. Indeed the world of the map is gripped by fear in the face of this phenomenon and there is a rush to defend land against a sea that refuses to keep its place beyond land’s edge and outside landed entities, such as cities and fields. In this milieu mangrove swamps have found new allies in people who appreciate them as ‘barriers’ while settlements on the sea seriously consider building sea walls, raising buildings and genetically engineering plants that can accommodate salinity.

Here, the 2005 flood is a timely call to look beyond the map, to question its wishful visualisation of land’s edge; to revisit measures of the sea lost in a world that accepts the reality of a coastline – i.e. the separateness of land and water – without question; to deploy a sectional view rather than plan-view in visualising the coast. It is also a timely call to recover the many landscapes of Mumbai that are kin to the sea, landscapes that elude the map because they do not encourage fixed geographic edges, landscapes such as maidans, talaoos, swamps, bazaars. These landscapes do not presume a known ground, but constantly re-make themselves in ways that push an inquirer to look further for the turtle beneath the turtle. But ultimately it is not the looking that matters; it is the re-making. These landscapes, which have been pushed to the margins or translated into geographically articulated land uses, are not spatial entities as much as they are acts of enterprise, appropriation, deposition, saturation that exist and extend by momentary transactions and events. It is not their fluidity that calls for attention. It is their initiation. They present a Mumbai that is not the entity that planners struggle to contain and social scientists work to comprehend (whether endlessly like Geertz or toward completeness like Hawking);
it is rather a field of initiations. Indeed Mumbai in an estuary changes the script of the past as it does the future; it shakes the geographic entities by which the events of history are visualised and the master plan of the future is envisioned, such as island, coast, land, sea, and city. In short, the world of the turtle between land and sea offers an alternative vocabulary of landscape and a spirit of design that could serve a world that has come to rest on the terrestrial map.

Monsoon 2008 has passed without much incident. The thirteen dangerous days predicted did not occur. The fear of the monsoon and sea that rose in April is a distant memory in September and Mumbai continues the terrestrial work that had stopped for the foul weather season, defining, reinforcing, and in many places, extending land’s edges; until, that is, the next April when the fear of flood will surely rise again. But this pre-monsoon fear may also well pass as Mumbai works out its drainage system and the rains do not come as they did that day, and the 2005 flood becomes a distant memory. Flood, however, is not so much a disaster that happens as it is a design practice that works until the next disaster does happen. And it will happen with a rainfall of far less magnitude than that which fell on 26 July 2005 which the plan in place acknowledges is far beyond planning for.

Mumbai is a relatively new entrant to the practice of flood even if the ground for this practice was laid three centuries ago with the drawing of a line on a map. Here it is in the company of many other places like New Orleans, which despite adopting and evolving the practice of flood over many decades with levees, dredges, pumping stations, and floodways went under water in the wake of Hurricane Katrina a month after the Mumbai flood. New Orleans, like Mumbai, is in a swamp and although the Mississippi that runs through it can hardly be compared with anything in Mumbai, it shares the terrestrial spirit of the map, viz., keeping the sea and river beyond land’s edge. Three years after Katrina the rescue of New Orleans is still underway and while the cause of the disaster and the slowness of recovery or even the will to recover is much debated there is little acknowledgement of the map and the reality that it has cultivated of sea and river beyond a line – ‘outsiders’ that are easily turned into enemies. ‘Keep the Mississippi in its banks and out of politics’ was a common refrain after the 1927 Flood when the ‘father of waters’ famously crevassed its levees and set in motion a war fought not just by ordinary people with sand bags but by the US Army Corps of Engineers based on the empirical studies of river hydraulics. The extraordinary landscape that the Corps has engineered holds the Mississippi within lines that have risen from the flatness of a map to 50 ft and more above ground. This battlefront has extended in the swamps, the vast ground where New Orleans is situated and which the Mississippi shares with the sea. Here the refrain extends to ‘keep the sea beyond land’s edge and out of politics,’ as people look for technological solutions that will return them to places that the world of the map colours brown even when, as it is well known with New Orleans, they are ‘below sea level’.

While people on coasts everywhere look to the practice of flood and the construction of a battlefront to protect land in the vein of the Corps of Engineers in order to overcome the threat of a rising sea, Mumbai can take a route that is intrinsically peaceful and accommodating. The sea is within the measure of landscapes that exist here outside the language of the map. These landscapes encourage practices that do not enforce clear and distinct separations in plan but accommodate fluidities in section. Soak is a practice toward making a Mumbai that is absorbent and resilient, a place that does not assume uncertainty as much as makes room for possibilities. It recognises that Mumbai is not just in an estuary, but an estuary in the monsoon. It is turtles all the way down.

notes
GLOSSARY

AQUIFER: a labyrinth of cracks, fissures, gaps, caverns, and absorbent materials below the surface of the earth that holds monsoon waters. These waters surface through wells and sometimes, particularly on higher ground, through springs.

BAZALT: an igneous rock found across much of Maharashtra marked as much by the event of its extrusion from fissures in the earth as by a fine crystalline structure resulting from the magma of which it is made cooling fast on exposure to the atmosphere.

BAZAAR: a web of commerce, where geography is blurred by relations of economy, by movements of goods that are often mysterious and unknown in a competitive and opportunistic world.

BEACH: a meeting ground of boat and land; a place that defies the surveyor with the constant change of its surface and slope through wave action of the sea; a place of anonymity that absorbs the traces of those who seek to escape the city and those without access to the city's infrastructure.

BOAT: a vessel made without the assistance of drawings; a vessel that beaches and sails with the tide of the sea.

BOUNDARY: a line that enforces a separation; a line crossed in an act of entry/exit or transgression.

COASTLINE: a clear and distinct separation of land and sea made believable by maps but hardly obvious on the ground and almost certainly not true in depth; a battlefront set up between land and sea by those who value the former over the latter.

COCONUT TREE: an economy in itself more than a botanical species of palm [Cocos nucifera]; a key player of the earth, the grove that is the place of primordial settlement in Mumbai.

CREEK: waters that flow in more than one direction, moving by the resultant force of the sea which they touch at more than one place; monsoon overflows coming off the land, and rain that varies by the geographic positioning of clouds.

DECCAN TRAP: a geological formation marked by a series of intermittent lava flows separated by times of sedimentation, zones of fusion, and beds of ash; a layered terrain that riddled along a north-south line, the western portion being downthrown to form the Arabian Sea, exposing an escarpment that eroded in steps (hence trapps, meaning stairs in Swedish).
ESPLANADE: formerly an area cleared to improve sightlines from the fort of Mumbai; a ground that acquired the status of a maidan.

ESTUARY: a saline gradient that varies at one end with the performance of the sea, at the other end with the overflows coming off the land, and all across with the monsoons from clouds in the sky; a dynamic threshold between salt waters and monsoon waters; a third coast after the edge of the sea on the west and harbour on the east.

FAIR WEATHER LANDSCAPE: a ground to which maps correspond, where the time of the monsoon is excluded because it is a spoiler of surveying activity and as such exiled to being an externality.

FLOOD: water crossing a line; a problem with a built-in solution of separating (or controllably separating) water from land; a battle between land and water.

FORT: a station point in a dynamic and hostile terrain, held firm by artillery as much as by the geographic coordinates of a map.

FOUL WEATHER SEASON: a time of the year associated with the monsoon when surveying activities are disrupted because of the inconveniences of rain but also because the distinctions that surveyors desire to see on the ground, particularly between land and water, cannot easily be made.

GATEWAY OF INDIA: the recognition of Mumbai in a time of British imperialism as the main entrance of trade and civilization to the subcontinent; a monument that celebrates this recognition, formalized in 1911 with the arrival of King George V as Emperor.

GHATS: a threshold; steps constructed to meet a rising and falling water line or found to do so as in the eroded escarpment of Deccan Trap along the west coast.

GRADIENT: relations on a slope between land and sea marked primarily by a range in salinity.

HARBOUR: a place of deep waters for ships to anchor and be protected from the monsoon; a place that is the 'front' of Mumbai, and for many, the starting point of its history as a city.

HORIZON: a line on which land, when approached from out at sea, begins its rise above the sea, the highest points first; a line in a landscape and understanding that can only be approached but not crossed.

ISLAND: a claim to a separation of a surface from the sea and a mainland; one of seven original islands called Mumbai believed to be patronized by the Goddess Mumbadovi and referred to as 'ilha da boa vida' or 'island of the good life' by Heitor da Silveira in the 1500s although he was more likely referring to Mahim (also called Mombamb and Mombaym by the Portuguese); a fusion of seven islands into a single land surface called Bombay.

ISLAND CITY: a city with an unusually strong desire to project its separateness from and difference with its surroundings; a city that projects itself to be on an island.

LAND: a surface of the earth that rises above the sea.

LANDSCAPE: a ground articulated with a particular language of distinctions and differences.

LINE: an act of drawing with the intention of connecting two or more points, marking an edge, or creating two sides.

MANGROVE: plants that thrive on a saline gradient; plants that are pushed to the edge of land by a comparison with 'land plants' and a theory of survival that portrays them as developing a 'salt tolerance' and a niche; plants that were once invisible to surveyors and picturesque artists because they were undesired spoilers of a clear and distinct line between land and sea; plants that are gaining visibility today because they protect land by dissipating the surges of the sea.

MUD FLATS: an in-between place that is open to absorbing overflows from the side of land and high waters from the side of the sea; the first ground to go in the act of reclamation.

MAIDAN: an elastic space that extends and diminishes through the performance of an event such as a game, a fair, or a political gathering; a non-descript ground that accommodates the elasticity of a range of events, often simultaneously with improvisation, negotiation and accommodation.

MAP: a drawing of the surface of the earth with a view from above, a vantage that privileged the fixtures of land over the dynamic and largely undistinguished surface of the sea.

MASTER PLAN: a way favoured by planners and administrators for orchestrating change on the basis of predictions and end scenarios in a landscape that is articulated primarily with a view from above.

MONSOON: a primary source of water, life and culture; rains from June to September that are held on the surface in terraces, tanks and talaoos, and beneath the ground in cisterns and aquifers; a 'foul weather season' to surveyors because it washed away lines of difference that they desired to see on the ground.

MONSOON SURFACE: a ground where waters of the monsoon overflow rather than flow, being articulated to hold rather than drain.

NULLAH (NALAI): a surface of holdings that is more field-like than drain-like.
OAT: a grove of coconut trees that admit the horizon of the sea; the place of primordial settlement in Mumbai.

OUTCROP: a rock that rises above a flatness around it that is in some way preferred, so that outcrops were (and are) levelled with as much reason to quarry them for stone as to clear them in order to make a 'normal' ground of settlement.

PALMYRA (BRAB, TAD): a seafarers' and surveyors' favourite tree because its distinctive individual presence on high ground made excellent ends to sightlines; a tree, the wildness of which, was often contrasted to the domestic nature of the coconut tree of the grove.

PIRATE COAST: the coast between Surat and Goa that experienced a conflict in the sixteenth and seventeenth centuries between those who defined their possessions as legitimate and those who threatened that claim.

POINTER: a point of intersection in a network of momentary transactions.

PROBABILITY: a mode of prediction favoured by administrators and planners that looks to past data to work out the likelihood of an event occurring and weighs the cost of intervening to protect against it, mitigate it, or accommodate it.

RECLAMATION: the making of land from a surface that is temporarily or perennially occupied by the sea with the conviction that this surface has the right to be land. Hence the 're'.

RESILIENCE: an everyday preparedness to accommodate an event no matter how unusual through a multiplicity of means; a way of designing that works toward accommodating more rather than less possibilities.

RIVER: a flow of water between two lines, which at one end converges to a point or points that are sometimes springs, but more often the start of riffles, while at the other end they diverge to connect with a coastline in opposite directions to form a 'mouth'; a void that is not represented through its own substance because it is in constant movement, but by the firm edge of land on either side ('riverfronts').

RIVER BED: the absence of a river for most of the year.

SALT: the material of a gradient that stretches from the sea, where it is always present in solution and seen upon occasion in crystalline form in salt pans or on leaves of mangrove plants, to land where it is more dispersed and recedes to being a flavour, a mineral with a crystalline structure and the formula NaCl (sodium chloride).

SEA: a ground that situates land on a horizon, but which land situates beyond an edge, a dynamic surface of the earth constantly being remade; a saline material that reaches into land on a gradient and permeates its depth.

SEA LEVEL: a measure of the height of the surface of the sea at any given moment relative to a benchmark on land; a measure that has encouraged an averaging across time and space to arrive at a 'mean sea level' for a particular place or for a country.

SHIP: a vessel that demands a drawing before it is built, deep waters to cast anchor, and a mediating infrastructure to connect with land, such as a boat or a dock.

SURVEY: an enterprise that delineates a territorial possession on the surface of the earth, but in so doing articulates the form and extent of the earth.

SWAMP: a place that first invokes an image of waste and sickness before it is appreciated as a unique ecology; badlands in need of 'development' or in need of proof as useful.

TALAD: a monsoon holding assisted by embankments and wells, that combines the forces of surface runoff and freshwater aquifers to keep saline water at bay.

TANK: a holding of monsoon waters on a surface either with an earthen embankment on its lower side or within a bowl where steps are often constructed to reach a shifting water line.

TERRACE: a levelling of monsoon waters on a slope with the help of embankments that could be as low as the edges of rice fields (which also involves the levelling of land) and as high as the bunds of tanks.

TERRITORY: a claim to an area of the earth's surface with an urge to define its limits as much for those outside it as inside it, such as with a fence or a line on a map presumed to be a shared language of representation between inside and outside.

TOPOGRAPHY: shape of a land surface that can be articulated in a map with the help of hachures, contours, spot levels, soundings and other ways of indicating slope.

TOWN: a settlement granted to proximate the city and the latter's clarity of difference with its surroundings and definitions of land use.

TRENCH: a cut perpendicular to the slope of a hill extending from a reservoir to collect surface runoff that would otherwise flow elsewhere.

WELL: an access to freshwater aquifers that avoids saline strata, a link between a monsoon surface and aquifers; a way of harnessing the pressure of ground water to keep saline waters at bay.
Soak is a new visualization of Mumbai's terrain. It presents Mumbai in an estuary, a fluid threshold between land and sea. It encourages design interventions that hold monsoon waters rather than channel them out to sea; that work with the gradient of an estuary; that accommodate uncertainty through resilience, not overcome it with prediction. It moves Mumbai out of the language of flood and the widely accepted trajectory of war with the sea and monsoon that this language perpetuates. It recovers the world of soak.

by Anuradha Mathur and Dilip da Cunha

Anuradha Mathur and Dilip da Cunha have focused their artistic and design expertise for the past decade on cultural and ecological issues of contentious landscapes. Their investigations have taken them to diverse terrains including the Lower Mississippi, New York, Sundarbans, Rio Grande, and Bangalore. They believe that landscapes are shifting, living, material phenomena that demand an attitude of negotiation rather than control. Their mission is to create through innovative modes of visual representation the ground for this attitude in design.

Anuradha is an architect and landscape architect. She is Associate Professor, School of Design, University of Pennsylvania. Dilip is an architect and planner. He is visiting faculty at Parsons School of Design, New York, and University of Pennsylvania, Philadelphia.

While Mathur and da Cunha's drawings and projects have been part of a number of exhibitions in the US and India, they have used the format of public exhibitions as a means of initiating and encouraging discourse on design and planning in contentious landscapes. They are authors of Mississippi Floods: Designing a Shifting Landscape (Yale University Press, 2001) and Deccan Traverses: The Making of Bangalore's Terrain (Rupa & Co., 2006).
IMAGE LEXICON

photosection:
a photographic sequence that cuts through time and space with rhythm and purpose.

linedrawing:
a drawing that constructs a landscape from a terrain by calling out things—objects, topographies, divides.

terrainplot:
a composite print that weaves two or more landscapes on a gradient to allow new extractions and meanings.

mithiterrain:
a ground that extends from the confined Mithi of maps through the agency of design projects that build resilience.

creekterrain:
Worli to Sewri along the north coast of the island of Mumbai as depicted in William Tate's 1827 map.

nullahterrain:
Vehar to Mahim organized by the centreline of the Mithi as delineated in the master plan.

monsoonterrain:
hills of Salsette structured by the three reservoirs built there in the nineteenth century.

photowalk:
a photographic recording that gathers moments, rhythms and adjacencies of a terrain.

project:
a layered drawing that transforms a photowalk through naming, sectioning, seeding, and programming.

place:
a field of names that refer to strategic and tactical operators of a terrain.

ground:
a sequence of sections through a photowalk.

armature:
an infrastructure that holds the seeds of a project.

notation:
a program of occupancies in time and place.

perspective:
a sequence of montages that relate multiple initiations on a horizon.