

The Missing Map
Exploring Singapore beyond the border

A study of the hinterland and productive territories around Singapore, as well as the flow of sand and other resources that have fuelled its growth, led Assistant Professor Milica Topalovic of ETH Future Cities into the 'negotiated territories' of map production. In this interview she talks about the nature and processes of her research, and uncovers her interest in a new urban paradigm for the region of Singapore—a 'missing map' of the future tri-national metropolis.

Interviewer: Narelle Yabuka



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The Strait of Singapore, 2011.



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Barges on the Strait of Singapore bring sand for construction into the city, 2013.

NY Tell me about your research. How did the Hinterland project come about?

MT I have been doing urban and territorial research for many years now. In 2010 I was asked to come to Singapore from ETH Studio Basel as an assistant professor to continue working in the large scale. I thought it was fantastic that I could do so in Southeast Asia, a new part of the world for me.

With my team and students, I began traveling across Singapore's border into the surrounding areas, the Riau Archipelago in Indonesia and Johor in Malaysia, that can be seen as Singapore's hinterlands. We have studied them in two ways. Firstly, through 'territories of production,' by studying the urban fabric of electronic manufacturing and other industries located here and managed by Singaporean firms and agencies. The sites we investigated also included the shipyards on the Indonesian island of Batam, and the palm oil plantations in Johor for example. Secondly, we tried to describe the hinterlands in terms of geographies and flows of five key resources into the city-state: sand for construction; water; food; human labour; and energy. All of those studies gave us an understanding of the region as a highly integrated space in economic terms, but a fragmented one in political terms.

NY What is it about 'the hinterland' that draws your focus? Today Singapore lacks its own hinterland, of course.

MT I asked a question about the hinterland, as I want to understand how we conceive of areas that are outside cities. The Future Cities Laboratory and many other research institutions today concentrate exclusively on cities, since the debate is dominated by the idea that half of the world's population has become urban. But what if we shift our focus outside cities? What about territories that are being emptied out for example? In fact we just have to reverse the question and say well, if the cities are transforming under this incredible dynamic, then there are corresponding urbanization processes at work in a larger territorial domain. I would like to understand that other side.

In Singapore, we therefore didn't look at the city directly, but indirectly, by looking at territories that are outside. For example, we studied the Straits of Singapore as an urbanised territory, showing that every square centimetre of the maritime space is planned too. We mapped zones of different uses, different corridors for movement, areas for anchorage, for quarantine, for one type of vessel, for another type, for security, for the border, and so on. We even drew a map of the night-time illumination of the Straits. Due to the exceptionally high density of activities and their meticulous organisation, the Singapore Straits resembles a 'floating city'. It is an illustration of urbanised territories that can challenge our conventional definitions of the city and the urban.

Recently the term 'hinterland' has become more important by way of concerns about sustainability. There is a lot of discussion for example about the relationship between the city and the larger territorial scale in terms of consumption. Is this relationship sustainable? How can it be sustainable? Is it

sustainable to consume resources over large distances? Should we produce locally? Should we change our habits? I don't think of this as questions of urban 'metabolism' and of quantity of material flows; I am not really interested in calculating. I would like to understand how it works in principle—how cities such as Singapore impact the territory around them.

After independence, modern Singapore was planned as a city on an island, a so-called 'city without a hinterland'. Colonial Singapore had different relationship with the surrounding territory: it was a port city located on the island's southern tip and the rest of the island was agricultural hinterland. But then in the 1960s an interesting paradigm shift took place; there was a drive to urbanise, and the whole island was to become a city. For example, around 1984 a formal decision was made that Singapore would outsource agriculture, mainly to Malaysia. Today, Singapore has one per cent agricultural surface, which is less than the area occupied by golf courses or military zones. Scientists today try to model Singapore's needs for food; in terms of quantities precise estimates can be made, one can also monitor the flows at the border. But I wanted to follow another logic. The food is produced in some real place; I wanted to go to that place and understand where it comes from and how it comes to Singapore. Is it far or is it nearby? Who makes it? What are the mechanisms through which a remote territory and its resources are kept in the gravity of a metropolitan centre?

NY Tell me about the process of producing maps.

MT When finished and reproduced in a book for example, maps usually look undeniable and exude scientific authority, but in reality the process of making them involves exploration and adventure. Often when seeking data on Singapore, we had to sign non-disclosure agreements only get the data for a specific part or a layer of the island. We'd ask, 'What about the sea? Who has that data?' We'd be told, 'It's another institution,' and there was another long negotiation process. Then we went to Indonesia, to Batam, where formal agreements have lesser value. Instead, the data can be shared based on trust and good personal relations. There are completely different rules, the culture is different. For Malaysia and Johor, we negotiated with various institutions and eventually bought data from TomTom, the car navigation company. I am actually writing about that process. For me, the map or the data that constitutes a map is a reflection of political processes, an indicator of—

NY Territories of negotiation?

MT Absolutely. None of this is unimportant. There is nothing especially rigorous or methodological about the process of map data collection. It is in the first place an interaction in the political field, with an independent agenda and an unpredictable outcome. We saw our role in composing all these disparate fragments of data and of maps that we found in the region among the three countries; thus we are talking about a new kind of openness. There was a lot of information we were not able to get, but we learned a lot in the process about accessibility, about information itself being a securitised territory.

NY Did also you travel around the region to make observations?

MT Yes, we travelled on land and even spent a lot of time on boats in the archipelago visiting different coastal sites, kampongs and uninhabited islands up to 100 kilometres away from Singapore. The most interesting part was approaching Singapore from the water. In Switzerland for example, the land is where the human settlements are organised, but here the situation is reversed; the sea is the centre. Cities and settlements were facing each other across the sea, and in the way that people moved and also how they provided for themselves, the sea was a bigger source than the land. We learned this in the archipelago. We were really inspired by understanding this reverse; that the sea is something that's in a way solid and stable and organising the picture of this region.

NY You've also produced some models. They describe the physical changes to Singapore's topography. Please tell me about those.

MT They talk about construction of land and territory through land reclamation for example. This project, *Constructed Land*, grew out of the study of Singapore's resource hinterlands, in particular its demand for sand. The

question of artificial landscape has been with me for a long time. After my studies in the Netherlands I worked on the Dutch landscape—a beautiful work of human culture over centuries. Some of the Dutch polders are now protected as cultural landscapes of great value.

Here in Singapore those topics have emerged in a new way. On the project we worked together with Prof. Uta Hassler's and Prof. Armin Gruen's teams. Part of the work was about understanding the dynamic of land reclamation and land transformation over time. Land construction had accompanied human settlements at any time in history, but if we look into the amounts, we find that in the modern history, and especially after the independence of Singapore, land transformation and reclamation became the basis of the city building. An extraordinary amount of land surface has been added to Singapore in the past fifty years: around on quarter of the original island. This process is central in many other cities too, especially port cities like Dubai and Shenzhen. Despite its doubtful side effects, expansion into the water has become a prime urban development strategy.

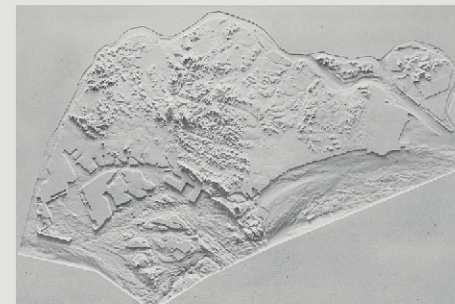
We made three models to show the impact of modernisation in Singapore via the transformation of the body of the island. The two smaller models show two moments in time. The plaster model shows Singapore's topography within the national boundary in 2012, including the maritime topography. The wooden model shows the topography in 1924, which was the year of the first cartographic survey in Singapore. If you wander with your eye between the models, you see an enormous difference (fig. 3). One can look at Jurong Island and the development around Bukom, Pulau Semakau, and the Tuas area. But what is perhaps less known is the extent of transformation under the water. The seabed is also an urban surface that allows the approach of vessels, and requires continuous maintenance through dredging. Some of the largest crude carriers and LNG ships need now a depth of over 20 meters. The entire port area is very differentiated in terms of accessibility. And in the Johor Strait, the models show clearly that additional depth was created.

Another fascinating aspect is the transformation on the island itself. If we look at the form of the models, we see enormous landscape alterations in the former hinterland—the East Coast area. Large areas of older land were levelled for development; a 'tabula rasa' operation took place. In thinking about urban growth and its effects, our attention is usually focused on the body of the city—the buildings—but to understand the entire 'environment' as being reshaped fundamentally through modernisation, this was astonishing. You probably remember 'Singapore Songlines'; there is this little sketch that Rem Koolhaas reproduced from an older study. It shows the topography of Singapore in 1958 having lot more hills than in 1989. In our project, we have in fact been able to describe this process of erasure and flattening of Singapore with high precision.

With these models of constructed land, we also wanted to talk about the memory dimension, about land transformation as something that essentially has to do with memory. Therefore to show the historic 1924 topography we used teak wood, which is a material that belongs to the past as well.

NY You mentioned sand for land reclamation as one of the five key resources flowing into Singapore. What did you learn about that?

MT A focus on the flow of sand emerged from the Hinterland study. Today, sand can be considered one of the crucial construction materials. In land reclamation, specifically river or beach sand is used. One cannot use desert sand to reclaim land, because it has a different type of structure; it does not retain the form. River sand is the material that produces the required stability, but it is less readily available. We learned that in the past, Singapore was sourcing its own materials locally. In the seventies, parts of the Changi area were cleared and the material was pushed into the water. Waterways were dredged as well. Nowadays, this is no longer possible; the radius of territory where the sand is sourced has enlarged. According to available sources, Vietnam and Cambodia are the largest exporters of sand to Singapore at the moment. It is fascinating that all the supplier countries involved in the sand trade with Singapore have in the past decade placed official bans on it because



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Constructed Land: 1924 and 2014 relief models of Singapore. Scale 1:50,000, elevation exaggerated by factor 6, 2x120x80x8 cm. Dental gypsum cast in silicon (below); CNC-milled teak wood (above). *Transforming Topographies*, Hassler, U., Topalovic, M., Gruen, A. FCL Midterm exhibition, September 2013.

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Constructed Land: Singapore 1924–2012, Hassler, U. and Topalovic, M., International Architecture Biennale Rotterdam, 2014.

of various issues—the detrimental environmental effects of extraction, but also the issues of sovereignty. A lot of attention surrounds this matter.

NY What about the ecology of constructed land?

MT It is an interesting question. For example, we wanted to understand the difference between a reclaimed site and an untouched site in terms of material. We took soil samples at primary forest in Bukit Timah, probably the only site in Singapore where one can find so-called undisturbed soil. We also took soil samples in Tuas, the reclaimed site of the future port, currently under construction. They immediately give an idea about diversity. It is evident that the original and reclaimed sites cannot support the same ecosystems. What kind of ecosystem is being created on the new land—this is a fascinating question.

Another related observation concerns the treatment of the shoreline. The new edge or interface between the land and the water is highly functional. It has to do with access or the laying of infrastructure. Therefore the ‘in-between’ condition of ‘mixing’ of land and water found in places such as muddy estuaries and mangroves is really not part of the modern city any longer. Today there are only a few sites in Singapore where one finds this in-between condition, and even those—if you look at the Land Use Plan 2030—are scheduled for development.

Interestingly, with all of the mentioned transformations, the shape of the island is completely unstable. Yet the shape of a nation territory is typically very important for its identity and for memory. Identity always has to do with stability.

NY It is difficult to draw the outline of Singapore. It’s somehow difficult to grasp.

MT Exactly. I recently saw a beautiful artwork by a young Singaporean artist Tan Peiling. She drew a very sensitive pencil drawing of the coastline around the downtown area—one line indicating 2012 and one indicating 1902. You saw one very orthogonal and mechanical line, and then another one that was organic and poetic. The form of the island in the memory is always more nostalgic and soft. The actual island is still not accepted as part of the image of the city.

NY Did you consider the psychological dimension of there being no hinterland—in terms of perceptions of control?

MT We encountered places and spaces in Singapore that gave us the impression of nostalgia for a hinterland or for an experience of a rural or traditional kind of space. Partly, this is a memory of the Singapore that existed in the seventies. Partly it’s a wish for an alternative, I think; for a space that is unstructured, and undefined in terms of rules and habits of urban dwelling. A space with less rules and more individual freedom.

In the northern parts of Singapore, there are few leftover places, for example a tiny corner of land standing between the highway and the water. Given that one couldn’t do anything with it, recreational fishing was allowed there. Some of the fisherman that previously had their piers in different areas were allowed to have their space there. Going to that place, I thought about this exact question you asked me. It was clear that this activity had nothing to do with livelihood; they were not fishing to sustain themselves. They were all people who now live in HDB apartments, but previously they were in kampongs. They were on that corner of land because of their culture and their memory; that space gave them their sense of identity.

NY What do your investigations tell about the future?

MT In one part of our study, we did an analysis of how this region is represented through maps. We discovered that there is no single map on which this area is drawn as a whole. In the past there were many; the nautical maps of the maritime trade of the past represented Singapore as part of a region that included large parts of Malaysia and Indonesia. An interesting phenomenon took place in the mid twentieth century with the breakdown of that view. Suddenly the maps shrunk.

One of the key insights that the Hinterland project brought us to, is that Singapore is facing a paradigm change in the future. It will move from its current model of an ‘island’ and a ‘global city-state’, to also becoming part of

the tri-national metropolis. The core city and what are now the hinterland areas can thus be seen as part of a larger metropolitan area. In this scenario, the border would possibly be more open. Singapore would have an opportunity to position itself as part of the metropolitan region—as a city where at a fifty-kilometre distance to the south there is the beautiful archipelago, and fifty kilometres to the north there are plantations. It is a different perspective, and it is attractive.

NY It’s an interesting proposition, and would undoubtedly be largely dependent on the commercial potentials for Singapore.

MT Demographic and economic trends can provide a glimpse to how this region might look in thirty years. The intensity and speed of transformation here are astounding. If we could imagine the building of modern Singapore fifty or sixty years back, we might see similar scenes now in the neighbourhood, in Batam. Its terrain is being reshaped with incredible force to accommodate infrastructure and buildings. In 1990, Batam had a population of 50,000; today it has 1.2 million. It’s already a big city, which is growing largely through spontaneous energy. Similar case can be made for Johor Bahru, which has around 1.5 million inhabitants.

Imagine if there’s another thirty years of that rapid transformation. My argument is that one aspect that will be less important in the future is the economic disparity. Those industries that currently have headquarters in Singapore and a manufacturing site in Batam would no longer operate here. Batam would produce higher-value products. This is, in a way, repeating the history of Singapore three decades ago. I think the conditions for opening up would emerge.

Therefore, the message of our work is: here is the image of Singapore not as an island, but as part of metropolitan region. Given the political stasis currently surrounding this issue, our work can be seen as a proposition for new ways of looking, new ways of perceiving and imagining this region. The map is always a representation, a tool of a particular political agency. An institution creates a map to mark its own domain and interpret the territory in its specific way. At the moment, the three adjoining cities in three countries don’t share any metropolitan visions, and have no common platforms among them. We wanted to suggest these opportunities by creating the image of the metropolitan region—the missing map (see fig. 5, p. 18–19).

NY Have you heard of Singapore being referred to as a ‘little red dot in a sea of green’?

MT Yes, absolutely. There is a huge question mark surrounding demographic trends. Singapore needs to import population to maintain the equilibrium or grow. It needs around 30,000 people per year. Therefore, differences and diversity will undoubtedly increase. Singapore is a city of migrants, and it will only be more so. Batam is similarly an incredible amalgamation of migrant communities from all parts of Indonesia; more than twenty dialects are spoken there. And then Johor is just a little bit more ‘green’ than Singapore, but not significantly. They have an open economy based on two ports, and a lot of foreign investment and work migration. The diversity there will only increase too. I think and hope that somewhere along the way, the green-red diagram of this region, which now seems so definitive, will begin to blur and become much more appealing with many different colours.

The interview was conducted in October 2013 in Singapore.

