Postcards from the Blue Heart:  
Landscape Change In the Dutch Lowlands

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Abstract

The Green Heart is an agricultural area situated in the center of the Randstad, a metropolis in the Western Netherlands. Like the rest of Holland, it is a constructed landscape. The region is facing twin challenges: the need to make room for water as a strategy to deal with climate change, and the fact that the liberalization of the European dairy industry will make it exceedingly difficult for small family farms to compete in the global market.

Certain places retain a historical, urban or cultural significance that transcends their physical or ecological properties; in its embodiment of the Dutch pastoral, the Green Heart has become such a landscape. The pastoral myth has very real ramifications for the identity of the Randstad, and must be carefully negotiated in any intervention that attempts to change the image or form of the Green Heart.

This thesis investigates how new natures can be constructed within the myth of the pastoral, through a study of this Dutch lowland landscape and a design proposal that encompasses the landscape and the architectural scales. The “Blue Heart” is both a strategic intervention that reinterprets additional water as an economic boon, as well as a building typology that enables farmers to capitalize on this new nature.

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Building “This” or “That” Nature

Nature

We live in the “Anthropocene”. This term for our predicament was coined by Eugene Stoermer and Paul Crutzen to refer to the fact that human beings are making an impact in the world on a previously unimaginable scale. The Anthropocene problematizes the idea of “Nature” as something which is no longer the virgin “Other”, but rather the product of multiple hybrid processes; the release of CO₂ and other gases into the atmosphere, the giant whirlpools of plastic circling in the North Pacific, the cycles of de-forestation and re-forestation, genetically modified crops, the selective breeding of animals, or the melting of the ice caps are all but some of the ways in which humans are actively changing what was previously considered untouchable territory.

In recognition of the impossibility of pinning down a true definition for “Nature”, Timothy Morton has described it as a “floating signifier” a “transcendental term in a material mask that stands at the end of a potentially infinite series of other terms that collapse into it”.”Nature” implies that which is given, original, good, the “norm”; as such it has become an ideology rather than a definition. Morton and others have proposed to do away with the concept altogether; for him, the conversation is “ecology without nature”, for Bruno Latour, things are not natural or unnatural but rather “continuously multiplying nature-culture hybrids”. The

destruction of the simple binary between Nature and Culture has far-reaching ramifications at the scale of the body/cyborg\(^5\), the political (where depoliticized techno-managerialism enters the realm of biopolitics) and the architectural (where the building envelope becomes thinner and "subnatures"\(^6\) which include things like weeds, dust, and dirt, must suddenly be taken seriously).

Contamination – with toxicity, dirt, radiation, concrete, weeds, smoke – is one frame through which to understand this breakdown of the concept of "Nature". Building envelopes become dematerialized, animals are invited in (see R&Sie(n)'s Mosquito Bottleneck)\(^7\), GM seeds escape into the biosphere. But the notion of contamination does not accurately describe the fact that landscapes have always been co-productions of nature, culture and technology. They have been contaminated from the beginning!

The Dutch landscape may be one of the clearest examples of this hybridity. Nowhere in the Netherlands is such a thing as "wilderness" to be found; the entire country has been designed, planned, shaped and literally raised out of the sea. Its most important monuments are nothing more than dry-earth production machines (windmills and dams); its "nature areas" are the result of technological failures; its political identity shaped by the processes of land reclamation. We may always have been modern, but the Netherlands has always been in the Anthropocene. The Dutch even have

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Ecology

Even if the concept of "nature" is dismantled, the notion of "ecology" (arguably) remains, and with it a long list of words that describe the ways in which it is deployed: system, process, soft, infrastructure, network, cybernetic, indeterminate, adaptive. What is ecology if nature no longer exists? It is an approach, a strategy that smells of science even when the issues at hand are far larger than the system can handle. In "The Order of Things", Foucault defined the Classical episteme as one of resemblance: to know was to represent, and to represent was to know. This mix-up between similitude and causality is still present; we often confuse a complex system with a "correct" system and allow the veneer of scientism to convince us.

A danger of the ideology of ecology is, as Erik Swyndegouw and Slavoj Zizek put it, its potential to lead to post-political sustainability politics where "ideological or dissensual contestation and struggles are replaced by techno-managerial planning, expert management and administration". Instead of choosing politically between "this" or "that" nature, post-politics frames the crisis of nature as something which can be fixed through neutral, expert scientific opinion. The "enemy" always vague, outside of capitalism, and constantly there. As a result of this culture of fear, techno-managerial politics become biopolitics, whereby the "regulation of the security and welfare of human lives is the primary goal".

In the Netherlands, planning has been depoliticized for many years, something that is most often celebrated as a triumph of long-term thinking over short-term political cycles. There is truth to this sentiment; indeed, the Dutch would not have accomplished many of their feats of engineering if their politics had gotten in the way of their planning. But in the face of rising sea levels,

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3 Swyngedouw, "Eco-Planning? Ecology as the New Opium for the People," 64.
4 Ibid.
Natural and artificial become indistinguishable. Sand on the Brouwersdam.
increasing river discharges, subsidence, and groundwater salinization, the Dutch approach to sustainability veers significantly into techno-managerialism, where a disconnected population is steered by experts into the "correct" direction. The familiar "nirvana image" of a perfectly safe, dry Netherlands dominates all decisions, at times short-circuiting the political process. Perhaps the solution is not to dismantle ecology or its associated processes, but to accept that the "solution" is not one but many, and that human beings make political choices that result in a particular kind of nature being constructed – wet, dry, green, blue, vegetated, barren, flat, hilly, toxic...

6 Ibid., 292.
If understood less romantically, Holland's famed windmills are just mechanical detritus from another era.
Persistent Myths

Even if "Nature" is dismantled as a conceptual framework, it continues to exist in the semiotic register through the many objects we associate with it and the myths we create about it. The Dutch countryside is a deeply technological and completely planned landscape\(^1\) – but it holds a significance as the "pastoral Other". The dominant objects in these landscapes – cows, barns, windmills, grass, and linear ditches arranged in an open, flat scene – have come to signify a particular kind of Nature – the pastoral – that continues to play a significant role in Dutch politics and planning as the void that balances the growing metropolis. The sanctity of the pastoral has led to decades of planning policies that strictly preserve agricultural land and restrict any other use.

The role of the signifier in the construction of a mythical Nature brings objects rather than fields or systems into play; the image of the individual barn or windmill can bring with it a significance that transcends ecology, and has great power to shape political outcomes. The object (and all of its cultural baggage) is a refreshing turn from purely systematic approaches to the construction of landscapes, but even here things are not black and white. When is a windmill no longer a “windmill”? The huge popular anger towards the construction of modern windmills in many countries would seem to suggest that there is a certain something that has been lost – even if both types are just variations of the same kind of machine. One has lost its cultural significance, the other’s has been mythologized.

But the truth is that these mythologized, “traditional” landscapes have always been undergoing a constant process of change and adaptation. The windmill was, after all, once a brand-new invention. It was not long ago that the Dutch polder landscape was not considered “beautiful”, and even the cow is a relatively new arrival\(^2\). We live in a world of flexible signifiers and our myths absorb new forms, new technologies, new types.

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2 Ibid., 202.
What is it about modern windmills that is so ugly?
A google search for “Dutch Landscape” yields...the myth of the pastoral.
What are the elements of the mythical Dutch pastoral?

Constructing New Natures Within Old Myths

Even if we operate on the assumption that Nature does not exist and that Ecology is ideological, the physical world is there in front of us and it is changing quickly. Climate change, globalization, the inconceivably fast growth of digital technologies...these phenomena demand action: the construction of new natures, new collectives, new assemblages. But what happens when they must be built within old myths? Where is the limit of a landscape’s semiological resilience? Here, the ideology of ecology (and systems, and infrastructure, and the network...) comes up against the object, wrapped up in all of its myths, stories, associations, meanings, cultural baggage. If all of the signifiers for nature are gone, can it still be called nature?

In the Netherlands, the myth of the pastoral has a powerful political significance; as the void in the center of the city, it allows the city to exist. That same landscape is on the brink of radical change as the forces of climate change and globalization are unleashed. What are the constructed natures (at the landscape and at the architecture scale) that address these pressures while operating within the myth of the pastoral?
Postcards from the Blue Heart
Technology-Landscape-Urbanism: A Short History of Holland

“Holland” is commonly understood to be synonymous with “The Netherlands”, but in fact it refers to two highly urbanized provinces – South Holland and North Holland – which contain many of the country’s most important cities and historical landscapes. The region’s development has been unique because reflects an extraordinary degree of interdependence between the manipulation of landscapes and the development of urban form. This is due to the fact that the entire region was once a marshy delta which has been reclaimed and reshaped over the centuries; the development of Dutch cities was originally simply an extension of this process. The various water management and pumping technologies developed over the centuries had a significant impact on the evolution of Dutch urbanism, to the extent that it is possible to talk about the evolution of landscapes, technologies and cities as a symbiotic triad rather than as separate entities.
Holland is flat, flat, flat.
The Green Heart is small, something made obvious when you look at the horizon. It's never empty. The next city is always nearby...
**Postcards from the Blue Heart**

**BOEZEM** n. Water storage between polder level and outer water

**OUTER WATER** n. Oceans and rivers.

**DRAINAGE DITCHES** n. pl.

**KADUK** n. Urbanized dike/canal.

**WETERING** n. Intermediate drainage canal.

**POLDER** n. Hydrological unit of drained land

**DRAINED LAKE POLDERS** n. pl. 19th c.

**PEAT POLDERS** n. pl. Medieval.

**WAARD** n. Collection of peat polder units.
Postcards from the Blue Heart

River settlement

Dike cities

High ground cities

Dam cities

Embankment cities
The original inhabitants of the Dutch lowlands settled on terps, or higher areas that were surrounded by marshy peatlands and peat streams. At this time the river flows within the Rhine-Meuse delta were uninterrupted and supplied the area with enough sediment to remain above sea level; the fact that the peat was kept wet also kept it from oxidizing and disappearing. Settlements that became cities such as Amsterdam or Dordrecht began as clusters of buildings on terps or along river embankments and gradually expanded as land was reclaimed.

In the early medieval period, the various Counts and Dukes of the region competed with each other to reclaim land, leading to the large-scale subdivision of the marshy landscape into "polders", or areas of reclaimed land surrounded by a dike. The reclamation of land was a complex process that required a high level of cooperation; diverted water needed to
Peat Polder land reclamation

Original river

Ditches drain to river

Land subsides; drainage reverses

Circulation along wetting/dike
Until 1500: Terp mounds and dikes

Political context: Survival

Site preparation: mound, dike

Urbanism is physical geography

Mound, dune, river cities

be channeled down an appropriate path that did not flood a neighbor’s field. and the safety of all depended on the maintenance of all sections of the dikes. The dikes were not initially needed, but as original settlers drained sections of marsh into the rivers, the newly dry peatland oxidized and evaporated, leading to the gradual subsidence of the reclaimed landscape that continues today. When the water level of the river was higher than that of the reclaimed land, it became necessary to build dikes in order to keep water from flooding back into fields. At this point the direction of drainage was reversed and water was diverted into “weterings”, or channels that were perpendicular to the river. These weterings fed into “boezems”, or intermediate water storage sites, from which the water was allowed to drain into the “outer water” (rivers or oceans)². This complex system of drainage was overseen by regional “water boards”, or administra-

Holland is the only place where you habitually walk under a river...
Peat polder land reclamation pattern
Postcards from the Blue Heart

Peat polder water settlements and ditches.
1500-1800: Windmills

Political context: land of cities

Site preparation: encircling canal and mud

Urbanism follows physical geography

Boezem, polder, fortification cities

tive bodies that ensured that the system was maintained for the safety of all. The democratic system of negotiation that ensured that the dikes and ditches were maintained became to be called the "polder system", and is a model of governance that continues into modern-day Dutch governance (as do the water boards themselves). The cities that developed on this landscape of rivers, dikes and polders often began as extensions of a dam (Amsterdam) or dike (Dordrecht), or on a strategically placed waterway (Delft). Their urban form was closely tied to the system of water drainage, and the historical cores of these cities still correspond to the original reclamation plots.

The invention of the windmill (a pre-industrial water pump) around 1400 was a pivotal moment in the

Drained lake land reclamation

Lake

Ring canal

Ring dike

Pumps divert water to ring canal
**Postcards from the Blue Heart**

**1500-1890: Steam pumps**

*Political context: constitution*

*Site preparation: lowering the groundwater table, sand*

*Urbanism influences physical geography*

*Polder city*

Evolution of Dutch landscape and urbanism. Now larger areas of land could be kept dry even as the land continued to subside; rows of windmills could move water significant vertical distances. Important Dutch cities grew within their fortified walls, but retained an intrinsic connection to the system of water drainage which kept them dry. In 1612⁵, a new typology of land reclamation was made possible as a result of the increased pumping power of windmills: the drained lake. The Beemster polder (now a World Heritage site) is an example of the highly designed drained lake polder typology. After building a ring dike around the lake, surrounded by a ring canal, the lake was drained using rows of windmills and canals arranged in a grid pattern that drained water into the ring canal on the outer side of the dike. The landscape design of the polder itself was highly specific and included farms on a grid punctuated by a town at the intersection of

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1890-1940: Modern pumps

Political context: welfare state

Site preparation: layer of sand with connections to the existing system

Urbanism ignores physical geography

Garden city

two major axes. Even the planting pattern along the main roads was specified. Following the Beemster polder, other lakes were drained, especially in the region north of Amsterdam. Their landscape and urban form can clearly be distinguished from the surrounding medieval “cope” reclamation pattern.

Between 1800 and 1890, the invention of the steam-powered pump radically shifted the scale of reclamation efforts. The draining of the Haarlemmermeer in 1850 was an enormous undertaking which was accomplished using only one steam powered pump and reflects the beginning of a shift towards the decoupling of urbanism from physical geography. For the first time, there was enough pumping power to base the pattern of land reclamation on the design of cities, and not the other way around.

The invention of the modern pump around 1890

6 Ibid., 126.
7 Ibid., 193.
allowed Dutch urbanism to proceed independently of Dutch water management, which in many cases led to a drastic reduction of surface water and water storage sites. Between 1890 and 1940, a prevailing trend was of "garden city" design, in which water was integrated in the city and partially connected to the existing system. In the postwar year until around 1970, postwar reconstruction and the doctrines of Modernism resulted in "neighborhood cities" of megastructures in which the new water system was completely separated from existing reclamation patterns. Between 1970 and 1990, "cauliflower cities" were built in places like Almere (a new city in the brand-new Flevoland, a polder reclaimed from the Ijsselmeer).
Beginning around 1990, it became increasingly clear that it was a folly to ignore the importance of water in urban design. Several near-flood-disasters made it clear that the gradual reduction of surface water storage sites in the Netherlands was a huge risk to cities; and that dikes could not be raised indefinitely as sea level rose, the volume of water in rivers increased, and land subsided. The change in philosophy was reflected in a turn towards “water cities”, in which new suburbs were planned to incorporate large amounts of water, even going so far to experiment with floating or amphibious buildings. Despite the new emphasis on water, however, the trend was still to start from scratch: the existing (often medieval) system of ditches and canals was completely redesigned to fit into new urban design ideas. The reintroduction of physical geography into urban design was only partial.

12 Ibid., 259.
Many of the new “water cities” built after 1990 were built as VINEX locations. VINEX (“Vierde Nota Ruimtelijke Ordening Extra”, which translates as Fourth Memorandum Spatial Planning Extra), is a policy briefing note of the Dutch Ministry of Housing, Spatial Planning and the Environment (Ministry of VROM) released in 1988 that set aside new areas of land outside of major cities for new development. Aside from their new focus on water, VINEX development are significant because they stipulate a policy of “decentralized concentration” that follows a Dutch tradition of drawing strict lines between city and country.

13 Barrie Needham, Dutch Land Use Planning: Planning and Managing Land Use in the Netherlands, the Principles and the Practice (den Haag: Sdu Uitgevers, 2007), 222.
The long history of subsidence in Holland is punctuated by technological inventions that enable certain kinds of cities.
VINEX housing is located on the edges of cities, close to public transportation.
The Randstad/Green Heart Binary and the Importance of the Pastoral Myth In Holland

“The Randstad” is a term that was invented in the 1930s by the then-director of KLM Airlines, Albert Plesman, who was trying to convince the Ministry of the Interior to build one national airport instead of three local airports. At that point the idea of one interconnected city was a stretch of the imagination, because the major Dutch cities were still quite separated from each other; however, in the next decades Amsterdam, Rotterdam, The Hague and Utrecht did become significantly interlinked. Randstad literally means “edge city”, and the term is a conceptual sleight of hand that allows this interconnectedness to happen without allowing the region to turn into a megalopolis, something that the Dutch have always viewed as a significant threat to their small country.

The solution to the problem of potentially uncontrolled sprawl was the Green Heart: the Randstad's other half and the thing around which it is allowed to grow. It, too, is a political construction invented to serve the myth of the Dutch pastoral. Its roots lie in fear: as soon as urbanization began to threaten agricultural landscapes, they became worthy of protection and gained cultural and aesthetic value. “Man-made landscapes, which were now under threat, also deserved protection. It was admitted that there were no purely natural landscapes left in the Netherlands, every area being subjected to human influence. There was only a differentiation in the intensity of cultivation. In this context the term natural value gained relevance, especially
in the 1970s. This category combined scientific elements such as authenticity, diversity and rarity, with attention for recreation and non-professional perceptions of nature and landscape. This softened the boundary between nature and culture.”1 The identity of the Green Heart is intimately linked with the identity of the Randstad: when the political climate favors an integrated Randstad, it favors an integrated Green Heart. When the political winds blow towards diversification, the Green Heart also becomes less unified. 2 The more the Randstad grows, the more valuable the Green Heart becomes.

1 Kooij, “How the Netherlands Got a Green Heart and Lost It Again,” 200.
2 Ibid., 201.

As a result of shifts in the technologies of land reclamation, the Randstad consists of multiple cities that radiate outward from their historical cores in an approximation of the technologies that were used to build them; at their outer fringes are the various VINEX locations. The Green Heart is comprised of largely medieval peat polders with areas that have been reclaimed from lakes; the peat polders are quickly subsiding, and as a result of the sometimes extreme levels of subsidence and high water table, large areas are devoted exclusively to dairy farming (since the ground is too wet to grow crops). It is spotted with small towns and crisscrossed by highways and train tracks.
Postcards from the Blue Heart

Green Heart: the rural side of the bonary

Randstad: the urban side of the binary
Dry networks (roads, rail)

Wet networks (boezem system, navigable waterways)
The Green Heart serves as a constant reminder of the "Other"; wherever you are in the Randstad, you are never far away from the mythologized Dutch Nature of ditches, windmills and cows. The images that come to mind are those created by 17th century artists who painted strikingly accurate, almost photographic depictions of this landscape, succeeding in creating a mythologized image of the Dutch pastoral Nature that continues to hold sway today. A google search of "Dutch landscape" will return many of the same idealized images that were recorded by Dutch painters four centuries ago, marked by the same architectural typologies: windmills (water pumps), barns, farmhouses, ditches, bridges, and cows.

The VINEX policy and the establishment of strict boundaries for the Green Heart happened roughly simultaneously, meaning that the VINEX developments could be said to establish the "frontier" of the pastoral. But since 1990, the real estate market in the Netherlands has been liberalized significantly, as the government steps away from housing and private investors play a much larger role. These recent political changes have resulted in more sprawl within the Green Heart, especially in strips along highways. But just as the Green Heart was invented when it seemed that the agriculture was threatened, the prospect of sprawl is again making this landscape more precious. In Holland, the thought that the pastoral is near is that which allows the urban to exist.
The Green Heart Needs to Change

Water

The Green Heart is facing significant pressures that threaten to fundamentally change its pastoral character and the nature of its relationship to the Randstad. One source comes from water: as mentioned previously, the reintroduction of water into Dutch suburbs came as a result of the realization that there was no longer enough space for water storage in the Dutch landscape, and that this was increasing the threat of flooding. But this realization is only a small part of a gradual and slow shift in national policy towards flood water management.

For centuries, the Dutch attitude towards excess water was to get rid of it as fast as possible. When land subsided or storm surges threatened, the response was to raise dikes and build hard infrastructure in order to keep the water out, and to continuously increase pumping power. In 1953, a catastrophic flood wiped out many of the dikes in the delta region south of Rotterdam, killing 1800 people and destroying entire towns; the response from the government was to propose one of the largest and most ambitious engineering projects ever seen. The Deltaworks were a series of storm surge barriers and dams that effectively closed off the sea from the delta region with the exception of the Western Scheldt (to allow access to Antwerp). The closing of the Zuiderzee from the North Sea created a huge freshwater lake (the Ijsselmeer) within which gigantic new polders were reclaimed.

For the most part, the Deltaworks infrastructures form a hard line against the sea that is effective in protecting against storm surges, but they also destroyed countless acres of

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The entire western part of the Netherlands is subsiding, but the peat polder lowlands are doing so the fastest due to the oxidation of the peat.
The Delta region south of Rotterdam is the site of the many of the Deltaworks, which have radically changed the ecology of the region.
natural estuarine habitat. Due to protests by conservationists and others, the Eastern Scheldt storm surge barrier was constructed as an innovative "closeable barrier" that under normal circumstances allows ocean and freshwater to mix; during storms, however, it can close in order to protect inland towns. This barrier represents the beginning of a change in thinking about water management and flood defenses that became more urgent after a near-catastrophic river flood in 1995. The dike did not fail in that case, but the experience of near-disaster prompted many to reconsider the all-or-nothing policy of the "hard line". As it became ever clearer that climate change was posing a real threat in the form of rising sea levels and higher river discharges, the official policy towards water began to shift towards adaptive management and increased flexibility with the goal of increasing resilience, in an acknowledgement that the extent of impacts from climate change were unknown.

A result of this shift in policy was the creation of the Delta Commission, a governmental body that was established in 2008 in order to develop action plans for integrated, systemic water management that reflect this changed attitude. The Commission produced a "Delta Report" in 2008 in which it outlined a series of recommendations for landscape-scale changes that respond to predicted threats from water: the increasing salinization of the groundwater, increasing river discharges, increase in sea level, the need to raise the level of the IJsselmeer in response to rising sea levels, the disappearance of mudflat ecosystems, and lack of water storage, among others. The proposed responses are large in scale but designed to be incremental and adaptable.

An example of this shift in thinking is the Room for the River program, which identified a lack of space for floodwater as a primary source of river flooding. Rather than raise dikes, the Room for the River projects reduced river obstructions, lowered dikes or moved them back, created new water channels and found ways to integrate floodplains into urban areas. The program was part of a larger campaign for "living with water", the government's attempt to shift cultural attitudes towards water so that projects like those in Room for the River would be accepted. Other projects like De Urbanisten's Water Squares, or the Sand Engine along the Delfland coast, try to encourage new ways of thinking about water as they integrate soft and flexible infrastructure, including the idea of "building with nature".

The need to increase space for water is not limited to rivers. A critical part of the Dutch water system is the interconnected boezem system, which is the network of waterways that acts as Holland's sponge: in times of flood, it

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2 Nijhuis, Meyer, and Bobbink, Delta Urbanism: The Netherlands, 37.
3 C. P. Veerman, M. J. Stive, and others, Working Together with Water: A Living Land Builds for Its Future (Deltacommissie, 2008), http://repository.tudelft.nl/view/ir/uuid:af79991f-31e7-47a4-a6ef-bfd54ca59c57/.
Neeltje Jans, the artificial island in the middle of the Eastern Scheldt storms surge barrier, contains an amusement park, visitor center, memorial and hundreds of rabbits.
The Sand Engine is an innovative approach to beach nourishment that "builds with nature". Sediment placed on the short is dispersed on the beach via wave action.
absorbs water from the polders and holds it until it can be released into the ocean or the rivers. In times of drought, the boezem system releases water back into agricultural land. The constant flushing of the polders with freshwater is important in order to keep salinity at bay. However, due to the draining of many of Holland’s lakes, including the Haarlemermer (which reduced the Rijnland boezem’s storage capacity by 80%), the ability of the boezem system to absorb and store water has greatly decreased, even as climate change makes this task increasingly crucial.

Within the Green Heart, the boezem system is particularly relevant; space for water can be found more easily found in farmland than in developed areas, and the expansion of wet areas would slow down subsidence. Some waterlogged peat polder regions are already considering large-scale intentional flooding because the ground is simply too wet.

6 Reh, Steenbergen, and Aten, Sea of Land: The Polder as Experimental Atlas of Dutch Landscape Architecture, 201.
to farm. Moreover, if the expansion of the boezem system were designed as an adjustment of existing water patterns (medieval ditches and canals) rather than as an entirely new element (such as VINEX water storage sites), it could provide the benefits of increased water without further shrinking the boundary of the Green Heart. Similar to the original development of Dutch cities, which could not be separated from land reclamation patterns, an expanded boezem system within the Green Heart could be considered in tandem with the overall evolution of this landscape.
Much of the western part of the Netherlands is below sea level, including the densely populated Randstad area. The ground in this region consists of peat, which disappears as it oxidizes, meaning that continuous pumping over the centuries has led to subsidence. Ironically, the highest points in much of the country are the rivers. It is a viscous circle: if the pumps stop the land will slowly fill with water from below, but it is this constant pumping that leads to subsidence in the first place.

A series of dike rings offer protection from the water, with protected areas rated by their flood risk. In the Randstad, extensive dikes offer high protection that compensates for the region's vulnerable location. Since 1953, however, it has become clear that not all dikes meet the standard set by the government (red lines).

In light of climate change, the Delta Commission has predicted possible modifications to the nation's water system that will be needed in the short and medium term. These include the strengthening and/or expansion of the coastline, dealing with the increased intrusion of saltwater into the rivers, raising the level of the Ijsselmeer to adjust to rising sea levels, and possibly opening the Eastern Scheldt to the ocean again. These possible large changes accompany a program of constant dike strengthening and reinforcing.
The Room for the River program specifically addresses the threat of flooding from rivers due to increased discharge, through a set of physical landscape modifications deployed at key points along the rivers. Depending on the scale of the modification, the program may require relocating or adjusting property or even entire urban areas (such as in Nijmegen).
The Dairy Industry

The Green Heart contains many medieval peat polders that are entirely devoted to dairy production; the reason is that due to extreme subsidence it is too wet to grow anything except grass. (In some areas the groundwater level is only 40cm below the ground, and many plots are effectively floating). As a result, areas like the Alblasserwaard and Krimpenerwaard are filled with small family dairy farms and cheesemaking operations. The cows that roam the flat green landscape are an important part of the aforementioned pastoral image of the Green Heart, and, although farms have consolidated significantly in the last half-century, the average size of a farm in many regions remains quite small (24 ha or less than 50 cows in the Krimpenerwaard).

One reason that these family farms have been able to survive is due to an EU milk quota established in 1984¹, which artificially limited the amount of milk able to be sold on the market and allowed small producers to compete. However, the quota was lifted in April 2015, meaning that dairy products from Europe are entering the global market, effectively making it significantly harder for small producers to stay operational as demand from places like China skyrockets. An option for family farms is to leave farming, selling their land to large companies or developers. Another is to establish cooperatives that allow multiple family farms to combine resources in order to compete with larger companies. Or, incomes can be diversified² by adding tourism or recreational facilities to their farms, producing non-dairy products.

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or taking payments from the government for maintaining ecological health and biodiversity.

Farmers in the Peat Meadows of the Green Heart have much to gain by returning to the kind of more multifunctional activity that was commonplace before farming became a market-based activity. Particularly in the Green Heart, there exist many possibilities for synergies between farmers and the urban areas that surround them, especially if “landscape value”3 (read: pastoral mythologies) is considered to be a real monetizable element. The addition of water into the landscape is difficult for dairy farming…but perhaps not for other income-generating activities as farmers turn into countryside entrepreneurs.

The local or provincial governments of various regions of Holland have understood that a massive scaling-up of dairy operations in the Green Heart would have a huge impact on the Dutch agricultural landscape, and have called for new designs for barns and agricultural facilities that can be integrated into other infrastructures and amenities4 5 6. But the answer to this economic dilemma cannot be found solely in better designs for barns, especially if the rural character of the Green Heart is to be maintained (although the modernization of the dairy sector may certainly be a part of the solution). Rather, the issue requires exploring options for alternative and cooperative sources of income.

3 Ibid., 212.
5 “ALFA-Bouw Inspiration Book” (ZLTO, n.d.).
Postcards from the Blue Heart

**From Green Heart to Blue Heart**

The simultaneous insertion of water and economic reorganization of the Green Heart are major challenges facing this landscape that have the potential to radically change it. A simple solution would be to introduce several large lakes that increase its storage capacity, while raising dikes and scaling up farming operations. But the simple solution does not consider the vital role that the pastoral plays within the Randstad; as the city grows, the mythologized pastoral acts as its void, and its typological elements - its windmills, pumps, bridges, parallel ditches, farmhouses, cows and skies - are critical elements of this world.

The Blue Heart is a constructed nature that builds on the existing objects and patterns of the Green Heart even as it is radically changed. The myth of the pastoral is retained, while the objects that comprise it are shifted, warped, adjusted to come to terms with new realities. At the landscape scale, existing historical water patterns are manipulated to give them new water storage and economic functions; at the same time, their new collective nature motivates the reorganization of farm property and encourages a shift in mindset towards “living with water” as well as “taking advantage of water”.

The architecture scale is an investigation of the shifting of a particular Green Heart typology (the barn) into a Blue Heart typology (the Continuous Barn). The construction of new assemblages, new collectives and collectivities at the architectural scale is contained in tension within the expanded prosthetic envelope of this kind of building.
Postcards from the Blue Heart

THE BLUE HEART
The Blue Heart: A Design Proposal

This thesis proposes intervening in the Green Heart at multiple scales. At the regional (landscape) scale, the strategic expansion of the boezem system through the manipulation of existing water networks can be seen as more than a way to improve flood resilience: it could also serve to bolster local economies by creating a new “watery commons” that provides alternative sources of income for dairy farmers. At an architectural scale, the development of a new building typology – the “continuous farm” – within this altered landscape can act as the productive transect of this wet-dry gradient, bringing together water, cows and people into new assemblages. At both scales, the altered landscape is an alteration and evolution of the pastoral ideal.
Landscape Scale

The Krimpenerwaard is the fastest subsiding zone in the Green Heart and a typical example of a medieval peat polder landscape. Weterings run almost parallel to the two large rivers that surround the island, between urbanized farmhouse strips along original "kadijks" and along the river banks. Many parallel ditches run perpendicular to the weterings, dividing the land into long strips of roughly equal width. Several small towns are found on the farmhouse strips, and on the north side boezems extend from the river into the fields. Several original peat streams also cut through the landscape, recognizable by their meandering form. De Loet is a peat stream which has been allowed to create a semi-flooded area and forest, used as a recreation area. On the west side the suburbs of Rotterdam touch the edge of the waard.

The Krimpenerwaard is marked by layers of water organization. A waard is a collection of water level zones (or polders), and in this one the original dividing lines between compartments have been simplified over the years. However, the target groundwater levels for each compartment still vary widely, because the different areas have subsided at different rates. The northern part of the Krimpenerwaard has subsided the most, leading some to classify it as an area that is best suited for "wet" activities rather than farming or grazing.

The Krimpenerwaard is subsiding very quickly. In some parts, the water level is so high that the ground is practically floating and it is even difficult to use the land for pasture.

The most quickly subsiding parts would be Blue Heart priority zones.
The weterings in the Krimpenerwaard which could potentially be expanded as a part of the Blue Heart.
The initial expanded wetting is located in the wettest, most quickly subsiding part of the Krimpenerwaard and crosses (is fed by) several historical boezems which can be expanded across the entire Krimpenerwaard.
At the landscape scale, this project calls for a strategic widening of existing waterways that is based on an analysis of the Krimpenerwaard’s “landscape grammar”; these new widened waterways then serve as flexible storage zones for water (new boezems), slow down subsidence by saturating the ground, and provide new opportunities for economic development. Depending on regional water conditions and the time of the year, the new boezems could widen outward several hundred meters, providing a safe place to store excess river water.

The waterway to be widened bisects the plots between two farmhouse strips (meaning it is the farthest wettering from the farmhouses) and is fed by the extension of boezems that connect the two rivers on either side of the Krimpenerwaard – this ties this new wet area to the larger regional system of water storage. In order to stop this new water from flooding the farmhouses, new mounds are built between the farmhouses and the wettering, cutting off many of the ditches; the remaining water is rerouted into fewer larger canals that cut between the mounds, and contain a pump that maintains

schielandenekrimpenerwaard.nl/over-ons/ruimtelijke-ordening-1/waterkansenkaart-krimpener
Postcards from the Blue Heart

The Blue Heart landscape consists of water and mounds with pumps situated strategically between the mounds. A new building typology (the Continuous Barn) connects the original urbanized farmhouse strup to the new water.
Affected farms, new feeder boezem and wetering to be expanded

New high ground and pumps

New topography

Continuous Barns
Postcards from the Blue Heart
the correct flow of water between the new boezem and the existing ditches. This process creates a landscape that is seemingly subtly altered (the view from the road) but in reality is radically changed (the view from the boezem).

The reorganization of this landscape necessitates a rethinking of property as well as a return to the kind of cooperative negotiation that exemplifies the polder system. If multiple farmers come together to form cooperatives of 3-4 farms, they can collectively negotiate the shape of the mound that separates their farmhouses from the new wet zone at one end of their properties. Because this water level is
variable – generally higher in the winter and generally lower in the summer, but with unpredictable spikes and drops based on regional conditions – the profile of the mound determines the extent to which they own “dry” property vs. “wet” property. The material for the mound comes from the dredged earth that is a result of the widening of the waterway. The process of negotiation between groups of farms and the government is rooted in the old “polder system”, which is founded in democratic collaboration; this might more accurately be called the “unpolder” system.

It is both the establishment of cooperatives and the existence of a new wet-dry transect that provides new economic opportunities for farmers. In terms of dairy production, the formation of cooperatives would allow for the use of pooled resources and economies of scale, allowing farmers
The way the ground/mound is shaped has a different effect on the way the land can be used. Landowners can negotiate amongst themselves and with the government to design the profile of their land, given a certain minimum percentage of water and limited amount of fill material.
to compete with larger companies while retaining their independence. This may allow them to focus on alternative or niche markets as well as milk and cheese. The existence of the negotiated transect between wet and dry, moreover, opens up opportunities for income based on tourism and recreation as well as ecology (since the Dutch government does pay farmers directly for ecological services). For instance, canoeing through the Krimpenerwaard is a popular activity already; the creation of wider areas with more diverse vegetation and animal species could open up this landscape up to camping, fishing and other forms of recreation which could be monetized by farmers (and which is already occurring in other extremely wet agricultural areas).

In the future, a system of expanded weterings could cover much of the Krimpenerwaard and other agricultural polders, leaving urban strips and farms intact but radically changing how the landscape functions. As the population of Holland grows, this new kind of “Blue Heart” could also serve as a framework for a kind of urbanization that does not destroy the role of this region as the anti-Randstad. Rather than building new suburban subdevelopments, incoming urbanites and suburbanites could selectively infill the urban strip, while leaving the green-to-blue transect intact.
Architectural Scale

Given the reorganization of these agricultural plots into wet-dry transects that terminate in a new watery commons, the architectural component of this project explores how a new building typology (itself a commons, albeit at a smaller scale) could allow farmers to effectively utilize this new landscape.

The Continuous Barn is a long building that begins at the road, follows the slope of the mound to the new pump (hovering over the new canal), and extends over the water in the new boezem — terminating in an A-frame viewing and fishing platform. In its form it echoes the typical barn shape, but it is subtly changed. Its image in the landscape is of an adjusted pastoral typology rather than an entirely new element; the figure of the barn in section and elevation warps and shifts as it heads to the water, while retaining its fundamental identity as a barn. The horizontality of the landscape is respected while subtly altered.

Conceptually the barn is considered to be an expanded prosthetic that defines different building envelopes (as prosthetic devices or "life supports") for different inhabitants — namely cows and humans. Following trends in organic farming that radically simplify and "dematerialize" barns into simple roof structures with no stalls, robotic milking and plenty of ventilation, the outer envelope of the barn is nothing more than a rainscreen on trusses. Wood cladding wraps around the figure but splits to allow light and air to penetrate. The floor is hollow, allowing liquid waste from animals to flows down the slight slope into containers at the end. Animals are housed in several sleeping areas (sub-barns) within the continuous barn, but are allowed the freedom to walk up and down the structure and out onto the pastures.

The thermal requirements for humans are not the same as for cows; while cows generate enough heat to keep themselves warm at night, people generally require some form of insulation and climate control. The "human tube" is a separate thermal envelope that is inserted into the Continuous Barn and allows humans to share space with cows. The human tube penetrates, bisects and at times hovers above the barn, allowing for changed and closer relationships between cows and humans. It generates symbiotic relationships; for instance, guest accommodations in the wintertime are located above the barn, allowing the heat from cows to warm the human tube. Cow milking stations are located next to a milk bar. Manure pits are located underneath toilets.

The program of the Continuous Barn is relies on the section (relationship to the ground) as well as plan (relationship to the road/boezem and degree of wetness) for definition. The cow sleeping areas (sub-barns) are located mostly in zones with access to pasture — that is, where the Continuous Barn is all the same level as the ground. However, given the fact that the topography of the mound can be irregular, cows must sometimes walk to specific points in order to be let out. Human programs consist of functions carried out by workers (office work, sales, tours, farm labor, taking care of livestock) as well as recreational or tourist areas for visitors (a cheese market, guest accommodations, fishing and viewing platform, restaurant). Where the barn is closest to the road, it contains public functions like a storefront and gallery; where it hovers over the boezem it contains functions that cater to visitors coming from this waterway; and where it is closely ties to existing pasture it contains more worker spaces and functions.

The Continuous Barn is a strip that reaches from the road to the water.

Programs are stretched along the length of the barn and weave together humans and livestock with the help of the "human tube" which provides conditioned space.

Programmatic zones are determined by the barn's relationship to the ground (in section) and to the street/boezem (in plan).

More traditional farm program is located in the middle of the barn, whereas program for tourism or recreation is located nearer to the street and water.
Important nodes within the Continuous Barn include the end that reaches the road (the old pastoral); the end which hovers over the water (the new pastoral); and the inflection point of the pump, which is relevant because it is the high point of the mound on either side, the control point for water flowing through the canal, a crossing point for animals moving through the barn, and the point at which canoers paddling into the building actually dock their boats and enter.

For farmers, the Continuous Barn is a shared space for income generation from cows and visitors alike that benefits from the new wet landscape. For cows, it is a space that allows newfound freedom of movement and access to pasture. For tourists, it is a space that can be accessed either from the road or from the water and that offers leisure facilities, a resting stop on a canoe tour, access to purchase local dairy and farm products, and an “authentic” pastoral experience. If urbanites and suburbanites choose to move into this region in the future, the Continuous Barn can serve as a flexible armature for infill that does not destroy pastoral or ecological values. Even as the road becomes more densely infilled, the Continuous Barn can continue to serve as a space that allow for different, less homogenous assemblages.
The end of the Continuous Barn is a storefront and a "dront door" for workers and visitors alike. An entrance hall takes up almost all of the space at the very end; the human tube gradually narrows as it gets further away from the street, and becomes a hall that skirts a farmyard and garden.
Postcards from the Blue Heart
Near the center of the Continuous Barn are sleeping areas for cows (what would normally be called barns). Due to the immense heat of the cows, in the winter guest accommodations are located above the sub-barn. In this case the human tube rises and twists before crossing down on the opposite side of the barn. The cows use a composting barn technique, which produces extra heat and does not require the use of individual stalls.
Postcards from the Blue Heart

The pump is a crucial point for vertical and horizontal circulation: it mediates the flow of water between the new boezem and the existing ditches. Directly in front of the pump is an entrance for canoers who have found their way up the canal; here, they can dock their boats and walk up a ramp into the inside of the building. Behind the pump is a crossing point for people and animals to travel between the high points of the mounds.
The Continuous Barn terminates in an A-frame viewing and fishing platform that hovers above the water level. In the summer the space is completely open; this is also the only space in the Continuous Barn which is entirely cow-free. This is the zone which is most intended for tourism and recreation and includes a restaurant, garden, and guest accommodations.
Postcards from the Blue Heart
Conclusion

The Blue Heart is a new nature, an adaptation and evolution of the Green Heart that responds to the pressures of globalization and climate change while respecting that which gives it cultural value: its pastoral mythology. At the scale of landscape, building and even building envelope the Blue Heart creates new assemblages that question existing relationships; the form and content of the pastoral is radically altered even as its urban function is not.

Stan Allen wrote in “Points & Lines” that “to think of architecture as a material practice does not mean leaving questions of meaning entirely behind”. This project interprets the “question of meaning” as one of the central preoccupations of the field of architecture, and also something that resonates widely outside of it. When the cultural value of a landscape or a building is taken as seriously as flooding or industry, it provides a new set of constraints to be toyed with, rather than a death knell for creativity.

When the empty signifier of “Nature” is stripped away, the question of making becomes a political one. What kind of world do we want to create? Who lives in it, humans and nonhumans? What are we willing to give up in return for our new home? How do we work together to make this new nature? In Holland these questions like close to the surface: they have been asked countless times the first settlers decided to try to domesticate the marsh. The Blue Heart is one such nature, one possible world to be co-produced.

Bibliography


1. Postcards from Holland
NAARDEN

The fortified town is the anchor of the new dutch water defense line.
BEACH TOWN FRONT YARDS

The small front yard is a buffer zone luxury completely ignored in dense cities.
AN ASSEMBLAGE OF MATERIALS

The Brouwersdam consists of multiple material landscapes - beach (sand, rock), dune (sand, grass), water, street (asphalt, concrete), dam (asphalt, rock, invisible components) - within a small space, in which the boundary lines are particularly visible.
GREENHOUSE

Agricultural architecture: greenhouses of Hoek van Holland create a new, invisible (to most) urbanism.
DUTCH COAST

The Holland coast is an almost uninterrupted line of sandy recreation space, made possible by constant sand nourishment and a line of protective sand dunes.
WATER URBANISM

Traditional Dutch town planning is a reflection of conceptions of space (tight) and water (everywhere).
POLDER

Polder ingredients: geometric water lines and the negative space of dry, sinking land. The co-production of an environment together with the force of water, democracy, the chemical composition of peat, and the wealth of a trading nation.
ZANDVOORT RESORT

Zandvoort: Amsterdam’s beach resort destination. A beach with mass appeal.
A lack of space, the need for defense, the system of canals, and a need for light contributed to traditional Dutch urban form of narrow streets and tall buildings with large windows. Looking into kitchens and living rooms is a national pastime.
CANAL CITY

Cities like Amsterdam exemplify the integration of water into everyday urban life.
INDUSTRIAL RIVER

River industry along the Nieuwe Maas is a lifeblood of the Dutch economy.
THE PORT OF ROTTERDAM

From the north side of the Nieuwe Maas, the port of Rotterdam is a constant presence on the horizon.

Where is the estuary?
MECHANICAL BEAUTY

Windmills on Neeltje Jans are integrated into a place which celebrates technology. Are they beautiful?
SUNCATCHERS

Balconies and large windows strain to catch the northern sun.
THE SAND ENGINE

Components of the Sand Engine landscape: water, recreation, beach, surf, sand, town, dunes. The boundary lines are constantly shifting.
UPDATES

The iconic windmills of Holland made the land habitable - a job now relegated to less romanticized machines.
HILLS OF HOLLAND

Sand dune landscape: for once, you cannot see the horizon in Holland.
Anatomy of a beach: that particular zone of public recreation where semi-nudity is encouraged, orderly rows of beach umbrellas denote personal territory, and the land-water interface holds a permanent fascination.
LINES IN THE EARTH

The inseperability of Dutch politics, Dutch landscape, Dutch engineering, Dutch survival: inscribed in the earth itself.
BIKES

The ubiquitous bicycle reflects the flatness and smallness of the Netherlands, as well as its orderliness.
ZERO LINE

Holland's zero [elevation] line is a visual record of potential disaster.
In Holland, the train system is almost like a metro - this is only possible in a small and densely settled country.
BEACH BUILDING

Temporary beach structures (restaurants) are on the front lines of risk from the sea and represent a particular adaptation to the whims of a sandy landscape.
SNACKS

The important things in life.
POTTED GARDEN

An attempt at a garden in a paved world.
GREENHOUSE POLDER

Greenhouse landscape on a polder landscape: successive new generations of the "natural".
MATERIAL MEMORY

Tragedy inscribed.
STONE

The solidity of traditional defensive walls contrasts with the fluidity of the landscape.
HUBRIS
The hubris of the victor: history repeats itself even as it is remembered. Can we ever really be masters of the tides?
MEMORIAL

Desperate measures call for desperate times. What is the price of survival? What is the price of apathy?
ALTERNATE URBANISM

SAND MOUNTAINS

In the zone between the beach and the city is a surreal landscape: mountainous Holland.
NONHUMAN

Not only humans enjoy the beach.
2. Dutch Landscape Paintings

These paintings represent a mythologized interpretation of the Dutch landscape.
FLOCK OF SHEEP AT PASTURE, AELBERT CUYP
COWS IN A RIVER, AELBERT CUYP
Landscape with Cattle, Aelbert Cuyp
Landscape with Horseman, Aelbert Cuyp
MILKMAID AND COWS, AELBERT CUYP
PANORAMIC LANDSCAPE WITH SHEPHERDS, AELBERT CUYP
VIEW OF HAARLEM, JACOB VAN RUISDAEL
WHEAT FIELDS, JACOB VAN RUISDAEL
VIEW OF NAARDEN, JACOB VAN RUISDAEL
RIVER LANDSCAPE WITH CATTLE FERRY, SALOMON VAN RUISDAEL
RIVER LANDSCAPE WITH FERRY, SALOMON VAN RUISDAEL
RIVER LANDSCAPE WITH A SAILBOAT, SALOMON VAN RUISDAEL
A VIEW OF DEVENTER SEEN FROM THE NORTHWEST, SALOMON VAN RUISDAEL
WINDMILL AT WIJK BIJ DUURSTEDE, JACOB VAN RUISDAEL
LANDSCAPE WITH WINDMILLS NEAR HAARLEM, JACOB VAN RUISDAEL