

About the Series

A team of 16 Floridians representing water management districts, the U.S. Army Corps of Engineers, academia and the private sector traveled to The Netherlands in April for a week-long water management course at the UNESCO Institute for Water Education. The trip was an outreach of the Florida-Holland Connection, a formal partnership between the Dutch and Florida governments being established to exchange knowledge related to water issues. This report on the Floridians' study of Dutch water policies and what they mean to Florida was written by David E. Klement, director of the Institute for Public Policy and Leadership at USF Sarasota-Manatee, and a retired Florida journalist who was part of the team.

If the Shoes fit: The Florida-Holland Connection
Part I: It's All About Water

BY DAVID KLEMENT
For the Florida-Holland Team

DELFT, THE NETHERLANDS – Water.

It defines Holland as nothing else does – not windmills or apple-cheeked, blond-haired children or wooden shoes or even liberal attitudes toward drugs and sex.

Water is an ever-visible reminder of Holland's unique topographical makeup -- from the endless canals that checkerboard every farm field and most city neighborhoods to the massive dikes that keep the land dry if not high.

It is a vital factor in the economy of Holland, especially to the bustling seaports that launched colonists across the globe 400 years ago and now represent a key factor in the global economy as world leaders in container-shipping.

Fresh water is crucial to Holland's booming agriculture industry and its densely packed cities, while its salt-water shores support a booming tourism industry from land-locked European cities.

But water is an ever-present threat to Holland's very existence, a "water wolf" lurking just beyond the dikes that can devour a city or an entire region any time an extreme storm blows in off the North Sea.

By contrast, *sunshine* defines Florida. For much of the 20th century it has parlayed its sun-drenched climate into a booming commerce in agriculture, tourism, retirement and recreation.

Yet water is almost as integral a part of Florida's economic health – indeed, its survival, too – as it is Holland's. We just don't think of it in the same way as the Dutch – do not have the awareness of water's mixed blessing and curse which is bred into our fabric as 1,200 years of dueling with it have done for the Dutch.

Thus the Florida-Holland Connection. Florida and Holland, though far apart in climate, language and culture, have much in common when viewed through the prism of water. Each has vast stretches of low-lying seashore vulnerable to Mother Nature's whims. Each has huge populations living close to those vulnerable shores. Each worries about adequate fresh water resources to sustain its cities and farms. Each has erred in

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managing its water resources in the past – draining, dredging, damming and polluting as if water were a friend of limitless forgiveness.

And each stands in enormous peril from global warming as rising sea levels invade valuable turf and climate change produces weather aberrations with increasing regularity.

But there are important differences between these two water-defined entities. Holland understands water hydraulics – those 12 centuries of coping with the North Sea provided lots of lessons in water management. Its storm-surge protection system is second to none – indeed could be considered an eighth Wonder of the World.

Florida isn't a novice in the field – its engineers and scientists know plenty about wetland preservation, hurricane-proof construction methods and population evacuation.

And this crucial difference: Holland appears to “get it” on climate change. Florida does not.

These shared concerns and specialized areas of knowledge were the catalyst for a visit by a 16-member delegation from Florida to this historic Dutch city in April for an intense week of study and exchange of knowledge. The same concerns and specialized expertise brought a delegation of students from Holland to Florida this month to study our unique water management issues. The hope is that this partnership will become a model for international cooperation in climate-change issues that can be replicated by the United Nations to help other countries with similar resource problems find solutions by sharing technology and knowledge.

Gov. Charlie Crist is expected to sign an agreement with the government of The Netherlands in July that formalizes the Florida-Holland Connection. But it got underway unofficially April 14-18 when the Florida delegation of engineers, scientists, environmentalists, lawyers and academics trod the cobblestone streets of Delft to the UNESCO Institute for Hydraulic Education for an eye-opening crash course in water management.

The five days were crammed with presentations by Dutch academics and engineers on the strategies and expertise the Dutch have developed for dealing with natural events that are every bit as catastrophic as Florida's hurricanes. The week also included field trips to some of Holland's most impressive hydraulic projects, including the massive Maeslant storm surge barrier on the Rhine downriver from Rotterdam and the equally mind-boggling Oosterschelde storm surge barrier to the south. The enormity of those public works projects – the length of each arm of the Maeslant barrier is almost equal to the height of the Eiffel Tower and the ball-and-socket upon which each swings is 10 feet in diameter – had most of the Florida delegates shaking their heads in disbelief. From the country whose ingenuity and commitment put humans on the moon almost 40 years ago, that awe-struck reaction is particularly relevant.

For the overwhelming message of this course for me – and many in our delegation – was not just the Dutch technical skills in water management, impressive as they are. Rather it was the awareness of the Dutch chutzpah in facing up the challenges of their unique environment – the sheer audacity of the nation not only to contain an ocean now but to look ahead 100 years in anticipation of what climate change will mean to its 16 million citizens – and to be ready to deal with it. As the United States wallows in denial of global warming, Holland is actively preparing for weather aberrations that will produce catastrophic flooding and sea level rises that will inundate low-lying cities. This,

mind you, will be true not just for Rotterdam, Amsterdam, Delft or Haarlam on the North Sea but for Siesta Key in Sarasota, Anna Maria Island in Manatee, South Beach in Miami, Amelia Island off Jacksonville and Fort Lauderdale Beach. The warming of our earth is indeed global, respecting no boundaries.

And this important insight: As the United States finds itself mired in shaky economic times, if not outright recession, Holland basks in prosperity and its industries boldly plan to capitalize on the opportunities presented by global warming and sea level rise. From a massive expansion of the Port of Rotterdam – already the busiest in the world – to research into “smart soils” for dike-building and pinpoint weather forecasting, the Dutch are marching boldly into the scary new world of glacial meltdowns, flooding and droughts that a warming planet will produce – not just to protect their people but *because they see economic benefits in doing so*. There is, in this partnership, not just an exchange of expertise in restoring a wetland or preventing a storm surge but also the prospect of creating jobs and business opportunities as international companies take notice of Florida’s pro-active response to climate change, including Gov. Charlie Crist’s aggressive “green” initiative.

Most striking observation of the week was this: Aug. 29, 2005, appears to have more significance to the Dutch than to the United States. What’s important about that date? It’s the day Hurricane Katrina struck New Orleans, La.

NEXT: The Dutch hear Katrina’s wake-up call; U.S. goes back to sleep.

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If the Shoes fit: The Florida-Holland Connection

Sidebar w/Part I: UNESCO/IHE

Be praised, My Lord, through Sister Water; she is very useful, and humble, and precious, and pure.-Francis of Assisi (1181-1226)

BY DAVID KLEMENT

For the Florida Holland Team

DELFT, THE NETHERLANDS – Water: The Drop of Life.

That is the title of a somewhat abstract statue in the dayroom of the UNESCO Institute for Hydraulics and Environment (IHE). The sculpture, by artist Guillermo Losano, depicts a thin human form holding aloft a representation of planet Earth as a drinking vessel, from which falls a single drop of water.

The sculpture was a gift to UNESCO-IHE from the Blasé Pascal University in Cordoba, Argentina, in 2003. The roughly life-size statue says it all. Water is essential to life. The United Nations Committee on Economic, Cultural and Social Rights put it this way in a 2002 statement: “Water is fundamental for life and health. The human right to water is indispensable for leading a healthy life in human dignity. It is a pre-requisite to the realization of all other human rights.”

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Former Russian President Mikhail Gorbachev put it in this context: “Water, like religion and ideology, has the power to move millions of people. Since the very birth of human civilization, people have moved to settle close to it. People move when there is too little of it. People move when there is too much of it. People journey down it. People write, sing and dance about it. People fight over it. And all people, everywhere and every day, need it.”

But too many people don’t have it. Some 1.1 billion people worldwide lack clean drinking water, and 2.4 billion lack access to basic sanitation. The World Health Agency associates 3.4 million deaths each year with inadequate water and sanitation. The UN estimates that by 2015, at least 40 percent of the world’s population, some 3 billion people, will live in countries where it is difficult or impossible to get enough water for basic needs.

That is what UNESCO IHE is all about. It is a model for sharing of information on water, at the academic level – to train some of the best and brightest from water-impooverished nations to go back to their homelands and begin to improve water conditions there. It is a degree-granting institution offering master of science programs in four disciplines: Environmental science, water management, municipal water and infrastructure, and water science and engineering. Some 200 students per session, mostly from developing countries, come to Delft for 18-month courses of study and research that will prepare them for professional careers in water management in their home countries. The students, usually mature adults with a bachelor’s degree and a few years of experience in their fields, come from some of the poorest countries in Africa and Asia, most with desperate water situations. Many are sent by their governments; some receive scholarships from non-government organizations for the \$35,000 tuition/living cost of the course.

IHE was founded by UNESCO in 1957 in response to requests from Bangladesh and Indonesia to help deal with water crises. Since then it has trained 13,400 students who have returned to their homelands as scientists, engineers and policy-makers to help clean up polluted streams, find more water resources, develop water distribution systems and fight water-related diseases.

“Our vision is a world in which people organize their water and environmental resources in a sustainable manner, in which all sectors of society – particularly the poor – can enjoy the benefits of basic services,” Prof. R. A. Meganck, rector of the Institute, told a delegation of visiting Floridians at the opening session of a water conference April 14. “Our mission is to contribute to the education and training of professionals and to build the capital of sector organizations and knowledge centers in the fields of water, the environment and infrastructure, in developing countries and countries in transition.”

Indeed, the Dutch have a unique perspective on the “drop of life,” having regarded it as a “water wolf” prowling outside their dikes for 1,200 years. But that attitude is changing in modern Holland, both because of a growing concern for the environment and a growing awareness that global warming is changing the water equation. The changing attitude was summed up by Viek Verdult, chief executive officer of Zeeland Province, in an address to the Florida delegation at the 12th century Middleburg Abbey in mid-April.

“We have a long history of living with and fighting against the sea,” Verdult said. “And in the future this will be the same. Our economy depends to a great degree on the

sea. At the same time we have to defend ourselves against the dangers of the sea.” His province, whose name translates in English to “Sea and Land,” was the epicenter of the 1953 flood, when more than 1,800 drowned and much of south Holland was flooded.

The Delta Works chain of dams and dikes bought safety for Zeeland, Verdult said, but the threat of rising sea levels due to climate change has prompted a re-evaluation of the defense-at-any-price policy. “We have to think about what we would do when all our prevention measures will fail. Are we prepared for storm surge disasters?” he asked rhetorically.

Realizing that Zeeland is “in the front line of climate change...we cannot wait and see,” the province adopted a proactive stance toward the threat of rising seas, one that protects while also creating benefits for the economy and the ecology. “Our philosophy is that it is sometimes better not only to fight the consequences of climate change, but also to accept them and to make use of them, because the sea is not only our enemy, but in so many ways also our friend.”

Among strategies being implemented now:

- Where saltwater intrusion comes due to sea level rise, “accept it and make use of it” by promoting an aquaculture industry in place of farming.
- Where appropriate, making use of salt marshes instead of dikes as a coastal defense zone. Eventually, salt marshes will grow together and sedimentation will make the land rise.
- Put resources into building and renourishing beaches in front of dikes. A sustained beach-beautification effort has created a booming tourist industry in this once-isolated area of Holland.

But, Verdult, admitted, the Dutch don’t have all of the answers. “What if all our protection measures fail? Are we prepared enough?...We realize more and more that we do not know what to do when our system will fail.”

For such concerns, the Dutch realize they can’t go it alone. They are working with other European countries to coordinate plans should disaster strike, for as Verdult noted, “a storm surge disaster will not stop at the boundary of a community, province or a country.”

Nor does the effort stop at the shores of the Atlantic. “I think that the United States can learn a lot from us about the prevention against flooding, but we can learn a lot from the United States about the preparation and response.”

Offering Zeeland as “a laboratory for coastal management,” he concluded with this bottom line: “Climate change is a worldwide problem. It is necessary that we learn from each other. This can be in European projects, but also in trans-Atlantic cooperation.”

It was the message of international cooperation the Florida visitors were anxious to hear. But it is a message for the global community as well. We all have a role in protecting against, preserving and sharing the Drop of Life.

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If the Shoes Fit Part I

If the Shoes fit: The Florida-Holland Connection
Part II: Never Again: Katrina's Wake-Up Call to the Dutch
w/logo: If the Shoes Fit

BY DAVID KLEMENT
For the Florida-Holland Team

THE HAGUE, THE NETHERLANDS – Jan. 31, 1953, is a date that stands out in the mind of every Dutch citizen – equal, perhaps, for Americans to Nov. 22, 1963 (JFK's assassination) or Sept. 11, 2001.

The night of Jan. 31 and Feb. 1, 1953, much of South Holland drowned when a fierce North Sea storm combined with extraordinary tides to breach the dikes in Zeeland, Zuidholland and Noord-Brabant provinces. That “perfect storm” caused more than 1,800 deaths, destroyed 3,000 homes and forced evacuation of 72,000 people as it severely damaged almost 500 miles of dikes and flooded some 1,200 square miles (nearly two-thirds) of the country. The Dutch government, grown complacent by the steady improvements made in Holland's dike system in the modern era and the absence of any severe flooding since 1916, reacted with typical Dutch alacrity: Never again, they assured worried citizens. Holland would do whatever it took to protect its people from what they call “the water wolf” – a recurrence of the 1953 North Sea disaster.

And successive Dutch administrations made good on the pledge over the next 40 years. The ensuing public works project, labeled the Delta Works, produced a series of dams, locks, storm surge barriers and dikes that effectively walled off much of the south part of country from the North Sea – especially the Delta region into which three main rivers drain: the Rhine, the Meuse and the Scheldt. Initially budgeted at \$14.5 billion, the project effectively reduced Holland's exposed coastline by 435 miles by cutting off the sea's access to peninsulas and islands that formed much of south Holland's territory.

It's no wonder the Dutch thought they were safe for at least 1,000 years. The Florida-Holland Connection delegation that toured some of the facilities during a week-long water conference in April were awe-struck by the immensity of the structures. Veteran engineers from water management districts and the Corps of Engineers marveled at the Maeslant storm surge barrier guarding the mouth of the Rhine at Rotterdam. The barrier, a massive pair of gates that can be closed when a sea rise of more than 3.3 feet occurs, walling off the one-fourth-mile-wide waterway to protect more than 1 million people and the port's extensive shipping and industrial facilities. Each arm is 777 feet long – only slightly less than the Eiffel Tower is high – 72 feet tall and turns on a 10-foot-diameter ball-and-socket hinge.

Farther south, six big dams were built to block off the North Sea from inland territory. Largest of these, at Oosterschelde, is a massive structure that controls water flow across a 5.6-mile-wide bay. Almost 2 ½ miles of the barrier is a dam with 62 computer-controlled gates that permit tidal flow during normal weather but that can be closed when excessively high tides are expected, and over which a highway carries traffic.

Massive. Awesomely so.

But then came Aug. 29, 2005. Hurricane Katrina struck New Orleans and southern Mississippi with Category 4 fury after swiping south Florida four days earlier.

The storm in the upper Gulf Coast got the attention of Dutch water management officials thousands of miles away.

“Katrina really raised political awareness in the Netherlands,” Dr. Hans Balfoort, Director General of the Water Policy Board, informed the 16-member Florida delegation at a water course April 14-18 in The Netherlands. “The images (from New Orleans) really hit hard. . . It changed our way of thinking.”

Elaborating, Dr. Piet Dircke, professor of Urban Water Management at Rotterdam University, told me, “We always thought we were OK – that it (massive flooding) would never happen again. Katrina showed us it could happen tomorrow. We learned about emergency plans. The Netherlands has none – not a single evacuation plan.”

Katrina – as well as the blitz of hurricanes that struck the Gulf Coast in 2004-'05 – showed the Dutch the importance of moving people out of harm's way. Now Holland is developing plans based on the Florida modeling experience. In fact, the country's first major mock evacuation drill is scheduled to occur this fall.

“Our people say, ‘Hey, what's up with that? You told us *never again*,’” said Dircke. “Our new attitude of risk management means living with risk. . . Now we are in the process of creating evacuation plans, learning from Florida, which is second to none in emergency evacuation planning.”

Of more far-reaching implications, the Dutch see Katrina not as a once-in-a-century weather anomaly but the harbinger of a long period of aberrant weather events that will only make Holland's water problems worse unless it prepares to deal with river flooding now. Extremely high river levels that occurred after heavy storms in 1993, '95 and '98 were also seen as a pattern of unpredictable weather that will only worsen as climate change accelerates.

On top of wild weather events, rising sea levels caused by melting polar icecaps add to the Dutch problem. Conservative estimates put the sea level rise over the next 100 years at 7 inches for Holland; more liberal estimates go to 27 inches. Looking out 300 years, the “maximum scenario” of sea level rise for which the Dutch are preparing is 16.4 feet. Yes, that's 16.4 *feet*.

The floods in the '90s prompted a foreign newspaper to observe that while the Dutch had successfully sealed up the front door from flooding, i.e., the North Sea, they now were threatened at their back door by the mighty rivers draining northern Europe that flow through southern Holland.

Thus Katrina sealed a new Dutch strategy for dealing with water from one based on risk avoidance to one that emphasizes risk management. The new Dutch approach is called “Ruimte voor de Rivier” – Space for the Rivers. It's a 10-year, multi-national program started in 2006 to enhance flood-protection and environmental improvement of the Delta, initially budgeted at 2.1 billion Euros (\$3.4 billion U.S.). The name is descriptive of the effort. Instead of simply raising the dikes higher, as the Dutch have done for centuries as their country continues to sink below sea level, this plan focuses on giving the rivers more space to expand and thus to handle greater volumes of water in flooding periods. Created in cooperation with other nations in the drainage basins of the Rhine, Meuse and Scheldt – Germany, Belgium and Denmark – and approved by the 27-nation European Union, it is among the most complex public works projects ever undertaken. In a country known for monumental engineering projects, that's saying a lot.

The project will include enlarging river beds, removing groins and other obstacles that retard river flow, deepening the forelands in certain areas to accommodate more water, and actually giving up some precious polders (dike-enclosed land areas) by removing dikes. For example, near Cortenoever, engineers will enlarge the floodplain by moving a dike 4,000 feet to the east. Homeowners who will be affected by subsequent flooding will be compensated, as will farmers who lose agriculture productivity due to flooding anticipated to occur once a year. At Voorster Klei, a dike protecting residents from the Rammelwaard River will be moved and rebuilt from 2,300 to 3,280 feet west, creating a significant new flood plain.

All of this dike moving, it should be emphasized, will be done in an environmentally-friendly way, cleaning up polluted rivers and streams, enhancing wetlands and beaches while mitigating flooding.

For a people who have been building dikes to hold back water for around 1,200 years, *destroying* dikes to allow floodwater to spread into farms and homesites has to come as a culture shock – not to mention a heavy financial burden in a country that already spends fully 1 percent of its GNP on water management.

Yet it is reflective of the Dutch can-do spirit and their long-range vision for flood protection. They don't believe in waiting for disaster to occur. The centuries of disaster have taught them to anticipate the water wolf's next move. The questions left with the Florida delegation, some of whom have seen the New Orleans/Mississippi disaster first-hand, are: Do the Dutch know something about climate change that we don't know? If Katrina prompts them to spend prodigious amounts to prepare for impending disaster, why aren't we doing more to protect New Orleans? Or Tampa Bay? Or Jacksonville? Or Charlotte Harbor? Or Miami Beach? And if the Dutch are looking ahead to 2308, why isn't the United States at least looking as far as 2018, when some beach towns will begin to feel the effects of rising sea levels? Why did the Dutch hear the wake-up call, while our country merely hit the snooze button and went back to sleep?

Next: Economic opportunities in global warming.

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Sidebar: Climate Change Facts and Projections

- A global temperature rise ranging from 3.2 to 7.2 degrees by 2100, depending on model used.
- A sea level rise ranging from 7 to 23 inches by 2100, depending on model. Rise of 36 inches cannot be ruled out. A 16-inch rise would displace 7 to 10 million people in Bangladesh.
- Arctic temperatures have risen 4 to 5 degrees in past 50 years – twice as fast as elsewhere on the globe.
- Summertime ice in Arctic Ocean has decreased by 7 percent a decade since the 1970s; it declined 23 percent between 2005 and '07 alone. North Pole could be ice-free in summer by 2030.

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- Warming of the climate system is “unequivocal.”
--Source: Intergovernmental Panel on Climate Change, Fourth Assessment Report, 2007

If the Shoes fit: The Florida-Holland Project Part III: Rotterdam, the Water City

BY DAVID KLEMENT
For the Florida-Holland Team

ROTTERDAM, THE NETHERLANDS – From the 30th floor of the World Port Center of Rotterdam, the largest freighters in the world look like toys in a v-e-r-y large bathtub. Some 100 such ships – plus several hundred smaller ones and countless barges – cruise into the port of Rotterdam each day, contributing to its ranking as the busiest port in the world.

Looking downriver toward the mouth of the Rhine River, I spot at least a half-dozen football-field-sized barges heading in or out on a cold, gray spring morning in this historic port city from which the Pilgrims began their historic journey to the New World in 1620. In my field of vision I can count at least 50 massive cranes rising above the flat landscape; more are faintly visible as far as the eye can see in almost every direction, until I lose count. On the roughly 25-mile ride on the Ring Road from the port to the mouth of the Rhine at the Oosterschelde barrier, one sees almost nothing but heavy industry – refineries, oil tank farms, container shipping docks, warehouses.

But the Dutch are not satisfied. The Port of Rotterdam is too small to accommodate their plans to capitalize on the container-shipping boom they know the global economy is in the process of producing. Thus the plan the Dutch have labeled Maasvlakte 2: To expand the port by 1,000 hectares (nearly 2,500 acres) by pushing back the North Sea. The scale of the project is mind-boggling to a Floridian who knows how difficult it is for a Florida port to expand. For example, it took Port Manatee near Bradenton five years to get permits for a roughly \$125 million, 500-acre expansion, which added a mere three new berths and expanded the turning basin and channel. The work is expected to be complete early next year – 11 years after conception. Port Rotterdam plans to reclaim nearly *four square miles* of North Sea for its expansion, at a cost of nearly \$5 billion. The plan was conceived in 1993 with an expected completion date of 2010, but environmental mitigation demands pushed the construction start date to late 2008, with Phase I completion set for 2013.

Maasvlakte 2 is another example of the Dutch chutzpah that a visiting delegation of the Florida-Holland Connection observed on a week-long tour of Holland in April – and of the ability of the Dutch to turn lemons into lemonade, at great profit. For even as climate change forces Holland to commit massive financial resources to shoring up its defenses against the “water wolf” that is an ever-present threat to life in The Netherlands, this country sees economic opportunities galore in the marketplace that global warming will create. Having battled the North Sea since today’s Dutch ancestors first settled these low-lying shores around 800 AD, Holland knows a thing or two about water

management, international trade, wetland reclamation and lifestyle quality – all conducted behind 25-foot dikes that keep out the North Sea.

All of these elements are part of M-2 – especially trade. The expansion will triple the port's container transshipment capacity. Its depth of 65 feet will accommodate the largest container ships, which are too big to navigate many other European ports. Rotterdam, central to many of the capitals of Europe – Brussels, London, Paris, Berlin, Vienna, Oslo, Stockholm, Helsinki and Prague – offers shippers a quick turnaround of freight in an era of just-in-time inventory control.

But it wasn't just the physical scale of the project that amazed the Florida delegation, awesome as it is. Maasvlakte 2 (the word is Dutch for "river flatland") is a joint venture between the Province of South Holland, the city of Rotterdam, the Port of Rotterdam and the central government. The engineers from Florida water management districts and Corps of Engineers marveled at the level of cooperation between the various agencies required to keep the project from foundering in red tape. They concluded that a project of this complexity probably could not happen in the United States with its overlapping regulatory agencies and powerful environmental movement.

Hans Janssen, senior advisor and hydraulic engineer specialist with the Centre for Public Works, told the visitors that it is "one of the most complex projects we have undertaken in terms of number of parties involved." He added with a smile, "Fortunately, there is not a lot of NIMBYism" to create additional problems – a reference to the Not-In-My-Back-Yard opposition that stymies so many projects in this country.

As if the port expansion weren't big enough, it's not the only massive public works projects underway in Rotterdam. This historic city, from which the exiled Pilgrims sailed back to England before making their journey across the Atlantic in 1620, is deep into "Waterplan 2 Rotterdam," a multi-pronged strategy to bolster the city's defenses from the impact of climate change while also transforming the somewhat gritty industrial city into a utopia of parks, lakes and canals befitting the label "Rotterdam Water City 2030."

That vision for Rotterdam's makeover by 2030 also is a multi-party plan involving the city of Rotterdam and three separate water boards, launched in 2007. The ambitious plan envisions many environmentally-friendly strategies such as green roofs, water squares and gardens, floating houses, transforming dikes to double duty as water barriers and "urban balconies," plus new nature preserves and trails. A key component is rebuilding the ancient sewer system, which now mixes rain runoff and sewage wastewater for a single primary treatment process before being discharged into the rivers. Separating the two types of water, as is common in the U.S., will raise the quality of water in canals and streams and ease the stress on treatment plants, which often are forced to dump untreated sewage into the rivers during periods of heavy rainfall when volume exceeds capacity.

Water planners say the project is necessary because global warming poses a four-pronged threat to Rotterdam as it exists today: Rising sea and ground water levels, increased rainfall and rising river discharges. Arnoud Molenaar, manager of the Water Department Public Works for Rotterdam, said that in the past, the city and its water boards used this equation in approaching water management: Water safety plus water quantity plus water quality equals water threat. Now, said Molenaar, the equation has a softer tone: "Water safety plus water quantity plus water quality *plus urban planning*

equals water opportunity for an attractive city.” That equation is built around social and economic values, where protection measures focus on building a strong economy and making the city more attractive.

The Rotterdam projects, both port and city, are a good example of the new Dutch approach to their water nemesis, the North Sea, and of a relatively new environmental awareness on the water boards that govern water management in Holland. The port project will solidify Rotterdam’s reputation as the busiest seaport in the world and prepare it for a new era of container shipping, which has been increasing at the rate of almost 6 percent a year since 1995. Opening of an entirely new Panama Canal to serve the massive new container ships that are too big for the existing canal, projected for 2013, will bring more container trans-shipment opportunities for Rotterdam. Poised near the mouth of the Rhine River/New Waterway channel on which Port Rotterdam sprawls, M-2 will enable those big ships to load and unload without navigating the 25-mile-long port corridor. That means faster turnarounds, a key factor in shipping economics. And the port’s location is ideal for quick transfer of goods to railroad and barge shipping throughout western Europe, factors that also affect shippers’ choice of ports.

The Dutch are proud of the environmental mitigation efforts they will make to compensate for M-2’s dredging, albeit undertaken under political duress. They will create three new nature and recreation areas on the edge of Rotterdam totaling 2,000 acres, a seabed protection area with five bird nesting sites, a new five-mile-long beach fronting new dunes, plus smaller green spaces and nature areas in the city and farther inland.

“We have never done environmental mitigation and monitoring on such a scale,” said Janssen.

Some of the Floridians were less than impressed with the environmental tradeoffs that M-2 is creating. “So they’re offering a measly nature preserve as mitigation – can you imagine that happening in Florida?” said one skeptic in the group. Yet most understood that these concessions represent an enormous shift in the Dutch approach to water management and commerce, which for centuries has had two primary priorities: protection and profit.

Yet the Rotterdam works left the Florida visitors wondering at the economic tradeoffs their country accepts due to its litigious culture and environmental activism. How can Florida and the U.S. compete in a global market if red tape keeps them from expanding ports to serve the coming superfreighters? What will happen to their port cities when ignored climate change impacts cause sea levels to rise by as much as two feet by the end of the century? Will Holland, India or China replace the U.S. as the economic engine of the world? They hope the Florida-Holland project will provide some answers.

NEXT: Too Much Fooling With Mother Nature

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Sidebar w/Part III: Economic Opportunities in Climate Change Research

BY DAVID KLEMENT

For the Florida-Holland Team

DELFT, THE NETHERLANDS – “The Dutch have learned the hard way that there is a need for advance knowledge.”

That understatement by Jos Dijkman introduced the Florida-Holland Connection team to the amazing world of research in which the Dutch – and forward-thinking corporations – are engaged as climate change presents new public-safety challenges as well as new economic opportunities. Here at the sprawling Deltares research complex a short bus ride from the center of Old Delft, some 800 employees are engaged in cutting-edge research in dike-building, weather forecasting, water movement and underground construction. Deltares is an institute funded by a consortium of Dutch companies and agencies of the central water policy board to the tune of \$87 million Euros (\$130 million US) a year to solve present and anticipated water problems, not just for this water-threatened nation but for clients and governments around the world.

“There are very few water-related projects worldwide in which we are not involved, said Dijkman, ticking off major hydraulic works in St. Petersburg, Russia, Venice, Dubai and even North Korea. It is working with the U.S. Corps of Engineers in Louisiana to study flood-risk reduction and landscape stabilization. Indeed, the eerie similarity to the Delta region of Holland and the Mississippi River delta around New Orleans offers Dutch researchers a rich research field outside their relatively narrow borders. And they are approaching it in amazing ways.

Here there are concepts like “smart soils” and electronically-wired dikes, models to simulate wave motion and test structural integrity, plus a relatively new branch of study called hydroinformatics. To the layman, this six-syllable word itself seems as exotic as some of the work being done here and elsewhere in Holland. Hydroinformatics draws on hydraulics, hydrology, environmental engineering and other disciplines to gather and process data related to all phases of the water cycle, from atmosphere to ocean, from urban drainage and water supply systems to flood and river basin management. It uses simulation modeling and information and communication technology to support policy-making at all levels of governance.

Data collection is key to much of the work being done here. For example, one project involves collecting rainfall patterns for specific geographic areas decades in the past and using that data, plus new monitoring techniques, to forecast rainfall amounts for pinpoint locations at specific times. Such forecasts could be key to anticipating a flood threat to a dike or a reservoir. Water managers at reservoirs such as Lake Manatee in Bradenton would know when to open flood gates.

One project measures sand flow carried by ocean currents. Another seeks to quantify in an equation the motion of waves. The equation is three full lines of text but as yet “has no solution,” said Dijkman.

In “smart soil,” researchers have discovered a process called “biosealing,” a process for repairing unseen leaks in dikes, dams or tunnels using micro-organisms – bacteria – that react with elements in the soil. The bacteria, injected into vulnerable dikes, are carried to potential leak locations by ground water flow. There their reaction with soil particles produces a hard, crystal-like mass to bind the soil into a concrete-like mass. Millions of these reactions eventually seal the leak without a spade of earth being turned over.

If the Shoes Fit Part I

But this is just one of many research initiatives centered in Holland. Arcadis, an international company with offices in Florida, is also a major consultant to the Dutch government. The company, with 13,000 employees and \$1.9 billion in gross revenue, designs and builds infrastructure projects for governments and private clients throughout the world

IBM also is a major player in the field, here and elsewhere in the world. “The smart companies are staying ahead of climate change – and they not doing it with empty pockets,” said Steve Payment, client executive with IBM in Florida, as he addressed the Florida-Holland Connection team in Orlando in early May. It was the same message that his Dutch counterpart, Djeevan Schiferli, had given during the delegation’s week-long visit to UNESCO-IHE in Delft. Other innovative international companies have a similar mindset, the Floridians learned during visits to research labs, field projects and think tanks in the Rotterdam-Delft-Amsterdam region.

Forward-thinking companies – and governments – would be smart to do the same.

IBM is interested in creating a better planet for ourselves as well as our clients, and is investing \$100 million in the next 10 years for research into green initiatives,” Schiferli said. “And water management is crucially important to green concerns.”

IBM’s goal is to be a “globally-integrated enterprise,” said Schiferli. Already operating in 170 countries, the company is seeking to collect worldwide expertise to prepare for climate change. IBM has several active projects in the United States to adapt its technology expertise to commercial needs.

It plans to open Centers of Excellence in various areas of the world to promote research and technology development with partners. Holland, by virtue of its expertise in water management, was chosen as the first site for a Center of Excellence. Florida, because of its shared climate- and water-related concerns, could be the second. But so could California or Louisiana, two other states with major deltas affected by storms, sea level hikes and environmental restoration needs.

Snagging such a center should be one of the first goals of the Florida-Holland Connection, the Florida team agreed at their post-mortem in Orlando in May. It would create high-paying jobs and position Florida as a major competitor in the climate-change technology race that is building around the world. With the water-savvy Dutch as partners, Florida might have a chance to cope with rising sea levels and aberrant weather patterns.

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If the Shoes fit: The Florida-Holland Project
Part IV: Too Much Fooling With Mother Nature

BY DAVID KLEMENT
For the Florida-Holland Team

MIDDLEBURG, ZEELAND, THE NETHERLANDS – Floridians beat themselves up over the way they’ve treated the Everglades in the last 100 years – for good reason. In creating a 2,000-mile grid of drainage canals to control flooding and make farming and residential development possible, we have shrunk that “river of grass,” a landscape unlike any distinctive natural area in the world, to a fraction of its original size. Among other

damage, that has cost the Glades 90 percent of its wading birds and threatens the future of 68 species of wildlife that are listed as threatened or endangered.

To the north, the Kissimmee River was turned into a drainage canal in the 1960s in the interest of flood control, drying up 30,000 acres of marshland and wiping out a once-prolific aquatic food chain.

The Dutch, whom Americans think are just about the best water managers in the world, have made their share of environmental mistakes too. A delegation of Floridians, some of whom are involved in restoring the Everglades and Kissimmee, got a good look at the Dutch miscalculations on a field trip to this former delta archipelago in southern Holland during the recent water conference arranged for the Florida-Holland Connection. The Dutch, with centuries of dredging and filling bred into their culture by the need to protect their below-sea-level topography from inundation, have felt Mother Nature's backhand from overzealous flood-protection efforts on a scale just as grand as the Everglades or Kissimmee.

Following the 1953 flood that killed more than 1,800 and forced evacuation of 72,000 residents when the North Sea breached dikes throughout this watery coastal delta region, the Dutch government vowed, "Never again." What followed was one of the most massive public works projects ever undertaken: The Delta Project, a \$10 billion series of 13 dams and dikes built over 30 years that effectively sealed off the islands from the sea, creating a new coastline that is 435 miles shorter than its original configuration.

The dams brought security for Zeelanders, whose isolation had preserved their unique cultures, dress, dialects and religious beliefs into modern times. But it came at a high price. Fishing villages saw their livelihood destroyed when boats were unable to reach the open sea and inland waters shifted from saline to fresh. Entire estuarine communities were upset. The lack of tidal flow produced massive blooms of algae and sea lettuce. Lakes became eutrophic, or stagnant. Polluted river sediments that once flowed out to sea silted up freshwater basins. Mud flats, salt marshes and shoals began disappearing because of "sand starvation" from the sea. Native fish populations declined, and bottom-feeding trash fish proliferated.

The Dutch have never been terribly environmentally conscious. Even in 2008 economic and safety concerns trump environmental issues, for as one Florida visitor observed, "Their priority is 'Never again,' and everything else comes under that. It is untouchable."

The Maasvlakte 2 plan for the Port of Rotterdam, for example, involves expanding the port by diking off four square miles of North Sea bottom. And in exchange for that massive dredge-and-fill project, another member of the Florida delegation cynically observed, "They're offering a measly nature preserve as mitigation. Can you imagine that happening in Florida?"

But there are signs of change. "We are becoming aware that the price of development is very high," said Tjeerd Blauw, of the Zeeland Provincial Water Authority, the Florida delegation's host for a tour of the province.

Indeed, for years the Delta Project was "put on a pedestal in The Netherlands, and criticism was simply not done," admits a report co-authored by Blauw. "This perspective only changed gradually, as people slowly started taking a different approach to water management..." That involved a change from sector-focused to integrated water management, said the report. Instead of looking at a water issue only in terms of safety,

agriculture or water quality, “there was a shift to an approach that integrates all of these aspects and more,” the report explained.

The fact that the Dutch have gotten the environmental message is perhaps nowhere better illustrated than at the Eastern Scheldt Dam here in Zeeland. The biggest of the seven dams in the Delta Project, Oosterschelde, as the Dutch know it, was designed to block off the five-mile-wide channel between Schouwen and North Beveland islands. For Floridians, it would be akin to closing off the mouth of Tampa Bay between St. Petersburg and Bradenton that is now spanned by the 5.5-mile-long Sunshine Skyway suspension bridge.

The dam presented special hydraulic problems for the Dutch. With an average tidal range of almost 10 feet and a channel depth of 131 feet, the basin moved massive amounts of water – 11 billion cubic feet with each tide, more than three times that of two other dams in the series.

The dam, begun in 1967, was two-thirds complete by 1973, when public opinion against the inherent environmental destruction finally began to register in Dutch political circles. As an official booklet documenting the Delta Project put it in 2007, “There was a growing awareness that the global assault on the environment could have catastrophic results. The idea gained ground that there had to be limits to growth, and the optimistic view of the future began to fade.”

After the environmental awakening, the concept of a solid dam across the mouth of the Eastern Scheldt gave way to plans for a new, even more monumental structure – but a more environmentally-friendly one. As the booklet explains, “Scientists, nature conservationists and fishermen spearheaded the protest against a solid dam. Their alternative was to raise the height of the surrounding dikes. Politicians initially refused to consider the plans. They had promised to dam the Eastern Scheldt, and they would keep their word.”

After years of heated political debate (a scenario which sounded familiar to the Floridians), the government finally named a special committee to study the project. Its report, issued in 1974, recommended a compromise: keep the Eastern Scheldt open most of the time but engineer it to be closed whenever there was a risk of flooding.

The result: The Oosterschelde Dam became the Oosterschelde Storm Surge Barrier. The barrier allows for tidal flow in and out daily, except when a storm poses a serious threat of flooding. The project tested the limits of Dutch hydraulic know-how. The barrier incorporates 65 massive concrete piers anchored to the river bottom, with 62 steel gates that can be raised or lowered by computer command. First, the channel bottom had to be stabilized to handle the massive tidal flow. For that the Dutch designed polypropylene “mattresses” filled with gravel, each longer than two football fields (650 feet), 137 feet wide and more than a foot thick. These mattresses trapped sand on the seabed while allowing water to flow through them. Sixty-five of them were dropped into place by a specially built vessel to create a 650-foot wide “carpet” upon which the piers were placed.

Because of tidal force, the mattresses could only be laid during slack tide, a period lasting about one hour twice daily. While one vessel held the mattress in place, another sealed the seams with 10-foot-wide layers of stone. Then another mattress filled with gravel was laid over the seams to prevent erosion of the bottom layer.

Then came the 65 piers. Each was built as a hollow concrete shell weighing 18,000 tons, ranging in height from 98 to 131 feet, depending on their position in the structure. When floated into position on a vessel especially built for this project, they were filled with sand, then anchored to the mattresses with a specially designed grout of concrete, gravel and sand. Bags of stone and asphalt, each weighing 30 to 40 tons, were dropped to anchor and protect the piers, and then a sill of stones – each stone weighing 10 tons – was added to protect the gates. The gates range from 19 to 39 feet in height; the largest weighing 480 tons.

Finally, a 150-foot-wide concrete cap was placed atop the lock to seal the towers and serve as a major highway. A lock, opened twice daily, also was installed to allow fishing vessels to go into the North Sea and return.

The barrier was dedicated by Queen Beatrix in 1986 – eight years behind its original completion date. But it was another tribute to Dutch ingenuity, if a grudging bow to environmental pressure. On average the barrier has been closed twice a year since its completion. That's 44 potential repeats of the '53 flood that were averted.

As to the environmental damage from the earlier dams, much has been restored. But much remains to be done. Algae blooms remain a problem. Water salinity balances are tricky, with the Oosterschelde gates permitting only about three-fourths of the daily tidal flow that existed before the barrier went in. At other dams not reconfigured there is no tidal exchange. In 1998, the government issued an official Fourth Memorandum on Water Management setting out a policy goal involving restoration and strengthening of the natural processes. Of special concern is a greater degree of exchange between the various water systems and a more gradual transition from salt to fresh.

In 2007, yet another concept was announced: "The Delta in Sight." The underlying principle of this approach, still being formulated, according to the report, is "to view the water not just as an enemy but also as a potential ally." The Dutch must "adapt ourselves more to the ground layer rather than vice versa, to make better use of the water systems instead of fighting against them."

To bring the water systems back into health, "we must remove the strait-jacket we have imposed on the Delta waters by impoldering (diking), so that the dynamic interplay of forces so characteristic of estuaries is again allowed to do its work freely and naturally,"

That admission resonated loudly with the Florida delegation. How similar it seemed to the restoration going on in the Everglades and the Kissimmee River. Even as Florida and the U.S. are spending hundreds of millions of dollars to recreate a river and restore the Glades, the Dutch are tearing down dikes and opening up dams for exactly the same reasons. The original dike-builders, the Dutch!

After three days of being overwhelmed by the scale of Dutch water management technology, the Floridians returned to their hotel this day feeling slightly less inferior in the water equation. Here, at least, was one area that Floridians know a little something about.

NEXT: The Challenge to Florida: Lessons Learned – or Not

David Klement is a retired journalist who is now director of the Institute for Public Policy and Leadership at the University of South Florida Sarasota-Manatee campus. He was a member of the Florida-Holland Connection delegation to The Netherlands in April. Email: dklement@sar.usf.edu

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If the Shoes Fit: The Florida-Holland Connection
Part V: The Challenge to Florida: Lessons Learned – or Not

BY DAVID KLEMENT
For the Florida-Holland Team

ORLANDO – The question was heavy in the air May 8 as members of the Florida-Holland Connection gathered in a downtown board room here for a post-mortem on their recent trip to The Netherlands.

It is the question implicit in the theme of this series: *DO* the shoes fit? Can the laid-back, flip-flop culture of Florida mesh with the stolid, wooden-clog mentality of Holland to justify a formal relationship between the two governments? What is the value of the partnership to each partner?

An hour into the meeting, it was clear that the disparate group of engineers, scientists, attorneys and academics believe the shoes *do* fit. Just how they'll be worn – and by whom – is the question still being pondered as this series concludes.

Some directions seem obvious. For Florida, there is great benefit from sharing in the accumulated knowledge of 1,200 years of water management that the Dutch have developed in the continual battle with the North Sea: dike construction, storm-surge barriers, drainage systems, pumping and land management.

For the Dutch, there is potential from sharing in the century of experience Florida has had in dealing with hurricanes: early warning systems, storm-resistant construction standards, evacuation planning, and recovery. Also, Florida's concern for the environment offers the Dutch lessons in pollution control, wetlands mitigation and restoration, and preservation of natural lands.

Research is an important factor in the partnership. As this series has shown, the Dutch are heavily engaged in research for new technologies to enhance dike stability, forecast weather, move water, advance green initiatives and harness the internet to gather data. IBM is aggressively investing in cutting-edge research to prepare it to prosper in a warmer, more watery world. It is establishing a Center of Excellence in Holland that will gather and apply cutting-edge technology for a variety of applications to benefit its clients – which include governments like The Netherlands. It plans to open such a center in the United States in the near future; Florida is a contender for that center, along with California and Louisiana.

Deltares, an international company, is a major player in water research in Holland. Earlier this year the company joined with the Rijkswaterstaat, the National Ministry of Transport, Public Works and Water Management, and provincial water boards to establish the International Deltares Institute to combine its scientific expertise in water management with that of the Dutch government. When fully operational it will employ 800 people.

Areas in which Deltares is researching include harbors and coastal engineering, wave dynamics, flood management and hydrology, river engineering, desalination plants, even something called “coastal morphodynamics and mud.”

If the Shoes Fit Part I

Behind this research is the impending threat of climate change. Almost everything the Florida delegation heard during its week-long water conference in Delft in April was linked to preparations for the effects of climate change. Holland, with two-thirds of its territory below sea level, knows what rising seas could do to the nation's security, both physical and economic. Already the Dutch attribute frequent weather aberrations that have caused heavy flooding throughout Europe to climate change. And they believe this is only the beginning. More ferocious North Sea storms will threaten the dikes, heavier rainfall will create flooding, droughts will dry up fresh water supplies, and rising temperatures will affect crops.

The Dutch aren't waiting around to see what happens. They have a global focus that has not yet reached policy-makers in the United States. In trade, in weather forecasting, technology development, transportation and land use, the Dutch are looking to the kind of world we will inhabit in 300 years. And as the opening lines of this series stated, that view is hinged on one unavoidable reality: It's all about water.

Water is both the lifeblood of the planet as well as its worst potential enemy. Entire populations in Africa, Asia and Latin America are at peril because of scarcity of clean water. Much of existing resources has been polluted; poor distribution systems add to the global thirst that will grow with expanding populations and dwindling water supplies as polar icecaps melt into the seas. At the same time, with 2.7 billion people – roughly 40 percent of the world's total population – living in or near coastal cities, many of them in deltas especially vulnerable to rising seas and violent storms, water poses an equally grave threat to life as well as to economic activity.

The disaster in early May in Myanmar after a Category 4 cyclone struck the Irrawaddy Delta, killing tens of thousands, is an all-too-graphic illustration of such vulnerability. So was New Orleans after Hurricane Katrina in 2005, and south Florida after Andrew in 1992.

What have we learned from those disasters? What can we learn to help us deal with future ones? That is the true bottom line of the Florida-Holland Connection. Bringing together the collective knowledge of both governments, along with the expertise of water professionals on Holland's water boards and our equivalents in the water management districts and Corps of Engineers, offers the hope of survival, even prosperity, if the right policy decisions are made in time.

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Part V Sidebar: Walkable Communities, Dutch-style

BY DAVID KLEMENT
For the Florida-Holland Team

DELFT, THE NETHERLANDS – New Urbanism is as old as some of the 13th century buildings in this historic Dutch city best known for its delicate china.

Indeed, city planners from Florida cities like Sarasota, Bradenton and St. Petersburg trying to create “walkable” communities that so many residents say they prefer to their traffic-choked suburbs could write their plans after spending two or three days in the narrow streets of Old Delft.

Within an easy walk are hotels, restaurants, shops, museums, theaters, parks and marketplaces – all the elements specified in grand plans for “new towns” in Florida. The narrow, canal-lined streets of Delft – indeed of Amsterdam, The Hague, Haarlem and many of the old cities on Holland’s Coast – simply do not accommodate much automobile traffic.

So people walk – or ride bicycles. For longer commutes, buses, trolleys and trains offer convenient choices from early morning to late night.

The flat terrain of Holland makes bike riding an ideal mode of transit for many Dutch citizens of all ages. Little old ladies and men pedal beside pierced and spiked students; moms and dads ride beside their biking kids to and from elementary school, with toddlers along for the ride in multiple seats. Many companies have indoor bike parking, changing rooms and on-site bikes for employees to take to meetings. Many subway and train lines have cars designated for bike riders to stow their machines.

There are more parking spaces for bikes than vehicles at train stations and public buildings; indeed, multi-level parking structures, similar to the auto parking garages at Tampa International Airport, for *bicycles*, are not an uncommon sight in many cities. A sea of parked bikes is the first thing one has upon emerging from the train station.

There are dedicated bike lanes on every street – some painted red, some simply marked with the bicycle icon at intervals. Pedestrians quickly learn to look both ways when crossing these paths. Bikes go fairly fast and do not suffer gawking pedestrians graciously. It took me several near-collisions with not-so-friendly riders to learn to look before walking anywhere.

There are even special left-turn lanes for bikes at some busy intersections here, where a fourth of the 40,000 population are university students. One official estimated that 80 to 90 percent of Holland residents ride bikes, with more bicycles than people. Fully 40 percent of Amsterdam commuters get to and from work by bicycle. Even Dutch Prime Minister Jan Peter Balkenende often bikes to The Hague and encourages members of Parliament to do likewise. Dutch Prince Maurits van Oranje is often seen riding around town.

In Lelystadt, a new town built in 1968 about an hour south of Amsterdam, there are separate transit systems for pedestrians/bicyclists and cars. Outside of town there are large parking lots for commuters to meet to join a car-pool. Anywhere in the greater Amsterdam area, there are frequent trains and buses connecting downtown cores, so one need not get into a car to go to work, school or shop.

A Floridian visiting these Dutch cities marvels at the ease of mobility Dutch citizens enjoy. At a time of \$4-a-gallon gasoline, walking to sidewalk cafes and shops or biking to the supermarket from a flat in a 15th-century building seems an attractive tradeoff for the manicured lawns and privacy of sprawling suburbia back home.

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By DAVID KLEMENT
For the Florida-Holland Team

LELYSTAD, FLEVOLAND, THE NETHERLANDS – We say we want areas despoiled by humans to be restored to their natural state.

But do we really have the intestinal fortitude to stick to that commitment through cycle after cycle of survival of the fittest?

I have my doubts, if “natural state” in Florida meant what it does at the Oostvaardersplassen Nature Preserve outside this new town in the watery Zeeland sector of south Holland. It is disturbing to walk through a dying forest in the preserve’s vast reaches. Dead trunks of willow trees, some 25 to 30 feet tall, litter the ground like a child’s pick-up-sticks. Some lean crazily against one another, their root balls half out and half still in the ground, their shattered limbs still struggling to put out buds in the chill Dutch spring. If they make it into leaf this summer, it will surely be their last. Nobody is doing a thing to stop the dying or to replant new trees. This is nature in the raw.

And then there are the animals. Wild horses, cattle, ducks and deer compete for the natural resources in this harsh landscape carved from the North Sea beginning in 1968. If they don’t find enough food in the grass, swamps and healthy remains of the forest, they will die.

At 13,000 acres, Oostvaardersplassen is the largest nature preserve in The Netherlands. Originally targeted to be an industrial park when this area was reclaimed from the sea in 1968, the tract was found to have poor drainage because it was the lowest part of the newly-diked area that the Dutch refer to as a “polder.” So while new towns like Lelystad and Almere were created to relieve crowding in nearby Amsterdam, this land lay dormant while officials pondered its future worth. “During this period,” says the preserve’s flyer, “nature seized her opportunity.” Marshlands developed naturally, and vegetation, including forests, began growing in higher, dry sections. Eventually officials decided to allow it to remain in its natural state – in fact to designate it as a nature preserve resembling the conditions in Western Europe 10,000 years ago.

Research indicated that wild horses and cows roamed the area in 8,000 BC, so 20 horses were imported from Poland and 30 cattle resembling the ancient wild breeds of Europe were brought in from the former Yugoslavia. Forty-five red deer were transferred from other European preserves, and wild birds like geese, ducks, egrets and owls found the marshes and woods attractive habitat.

The plan is for the preserve to create itself with a minimum of human involvement or interference. Natural rainfall and evaporation maintain the water levels. The cattle, horses and deer forage in the higher bushes and grass, creating open areas that attract geese. The geese browse the denser grass, creating open spaces that are conducive to other birds’ migrations.

Whatever happens in the preserve happens. The forest is allowed to die because that’s what forests do when trees exceed their lifespan. There’s no replanting, as forest managers commonly do in Florida nature preserves. In a few years, all of the dying trees will have fallen and rotted; indeed, the decaying process is well underway in swampy areas. A new forest eventually will spring up.

The same hands-off policy holds for the animals. Whatever number the land will support is the number that will survive. There’s no selective hunting to keep the

population in check with the resources, as is done in this country. And because there's a missing ingredient in this formula for a 21st century Eden – predators – there is nothing to hold down the cattle, horse and deer populations.

Except starvation.

Lack of predators has caused the initial herds to multiply exponentially. There are now over 2,400 deer, 900 cattle and 500 horses. When grasses are overgrazed, deer, horses and cows simply die, said preserve manager Hans Breeveld. To shocked Floridians' reaction to the concept of watching large numbers of animals slowly starving to death, Breeveld admitted that, because of Dutch law, preserve managers aren't allowed to leave carcasses out in the open to decay naturally. So when animals are found to be in a terminal state of starvation, they are humanely dispatched and the bodies hauled away.

Animal rights and environmental activists would never tolerate such hands-off management of nature preserves in Florida. We like Mother Nature to do her thing on our terms, not hers.

The Oostvaardersplassen preserve illustrates a strange dichotomy in Dutch and Floridian attitudes toward nature. Regarding water, the Dutch say, in effect, "Bring it on. We'll build our dikes higher than your waves. You'll never defeat us." Florida says, more or less, "OK, another hurricane is coming. Put up your shutters, get your emergency kit, go to your safe room and pray."

But in preserving a slice of nature for future generations, the Dutch attitude is, "Do what you will; we won't stand in your way." And in Florida the attitude is, "Get rid of the invasives and plant natives. Stage control burns to keep brush down. Let hunters 'harvest' excess wildlife. Groom the trails. And by all means, have rest rooms."

It's a different take on survival of the fittest.

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