FLORIDA SPACE COAST

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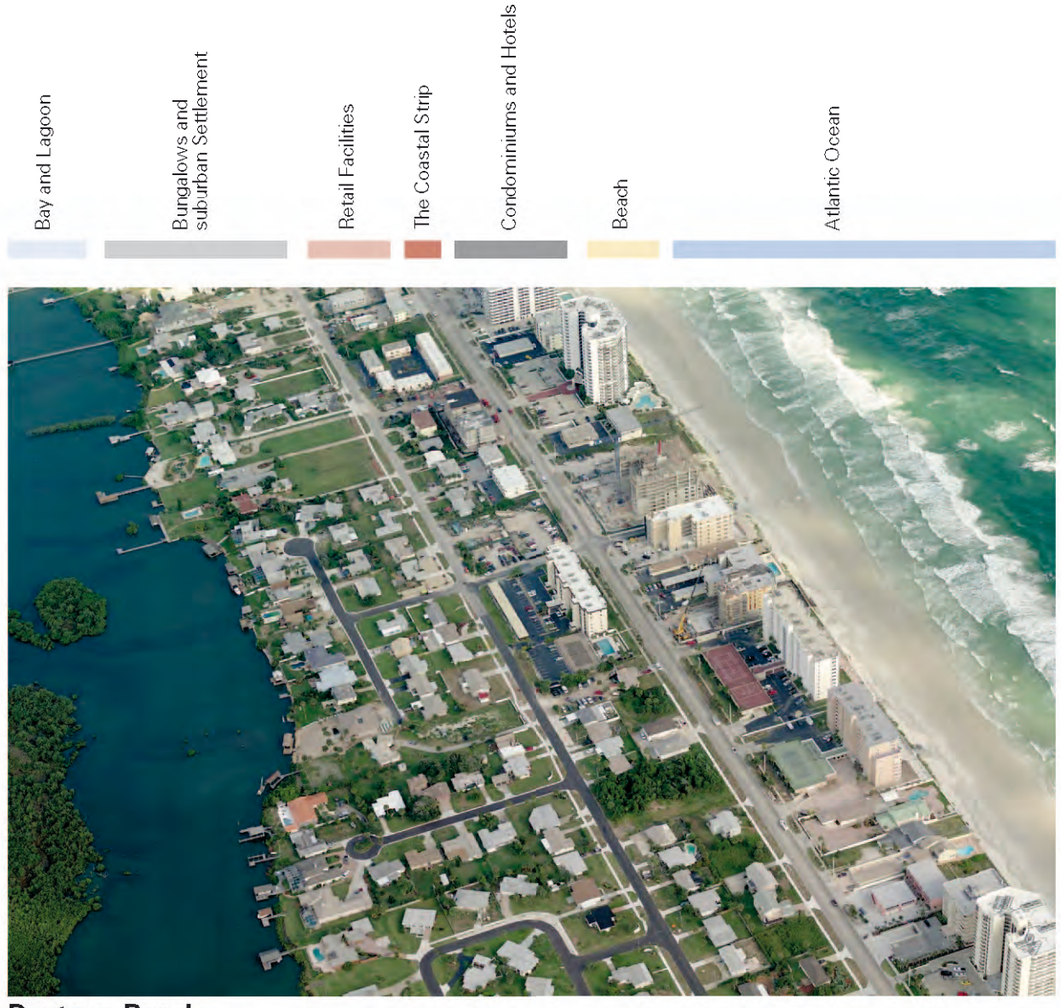
FLORIDA SPACE COAST

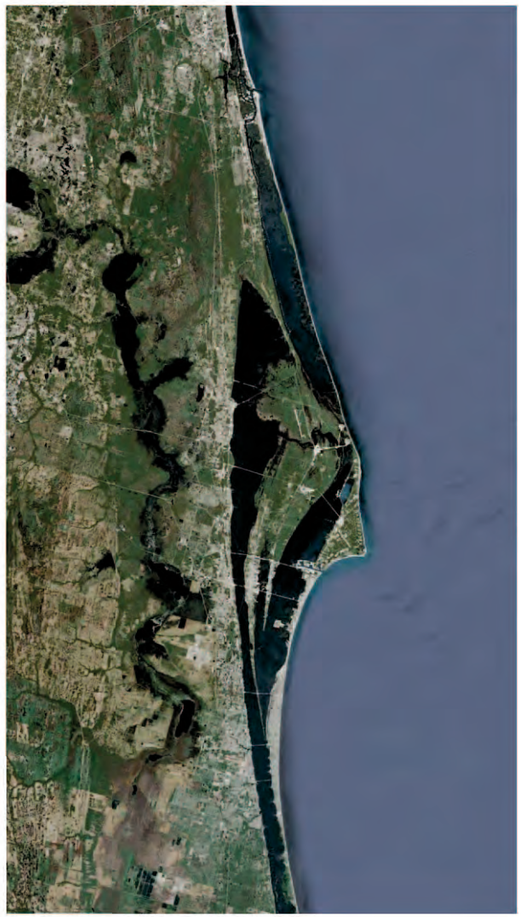
Florida's Generic Coastline

Towards the Atlantic Ocean Florida's Coastline stretches 800 km southwards and turns towards the Gulf of Mexico. This shoreline is heavily urbanized with a very specific pattern. Along the lagoon and the reef a strip-like city follows this longitudinal segment of Floridas coastline.



Daytona Beach

In between the lagoon and the beaches towards the Atlantic Ocean three main zones exist in the North-South direction:
Bungalows – the Coastal Strip with retail facilities – large scale condominiums and hotels.

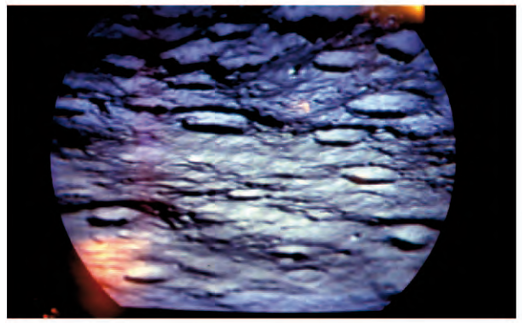


NASA Launch Facilities

Almost in the middle of Florida the only gap in the Coastal Strip emerges – Cape Canaveral. On this peninsula NASA established their launch facilities for the famous space program.

SPACE COAST™

The United States launched their first rockets into outer space in the early fifties due to military purposes: the "Cold War" asked for novel surveillance technologies by satellites and initiated an actual "Space Race" between the United States of America and the Sowjet Union.
Fueled by patriotic spirit, the breathtaking technological progress in the 21st century enabled the United States to reach their goal: Neil Armstrong was the first to set foot on the moon in 1969. The technological progress not only allowed for space exploration but also changed the possibilities of photography and other developing media. NASA's controlled publication of images and their mass production created a virtual reality, which itself created a pathos and affected the society of the Nation and of the World.
After forty years of physical and medial presence, a presence that has been in gradual decline ever since the moon-landing as the point of culmination, NASA has decided to stop its Space Shuttle program thereby loosing its last iconic media focal point. This had reverberations on Florida's eastern costal landscape and America's collective consciousness.



HOUSTON: OKAY. NEIL, WE CAN SEE YOU (ON THE TV) COMING DOWN THE LADDER NOW. (LONG PAUSE)

ALDRIN: OKAY.

ARMSTRONG: I'M AT THE FOOT OF THE LADDER. THE LM FOOTPADS ARE ONLY DEPRESSED IN THE SURFACE ABOUT 1 OR 2 INCHES, ALTHOUGH THE SURFACE APPEARS TO BE VERY, VERY FINE GRAINED, AS YOU GET CLOSE TO IT. IT'S ALMOST LIKE A POWDER. (THE) GROUND MASS IS VERY FINE. (PAUSE)

ARMSTRONG: I'M GOING TO STEP OFF THE LM NOW. (LONG PAUSE)

ARMSTRONG: THAT'S ONE SMALL STEP FOR (A) MAN; ONE GIANT LEAP FOR MANKIND. (LONG PAUSE)

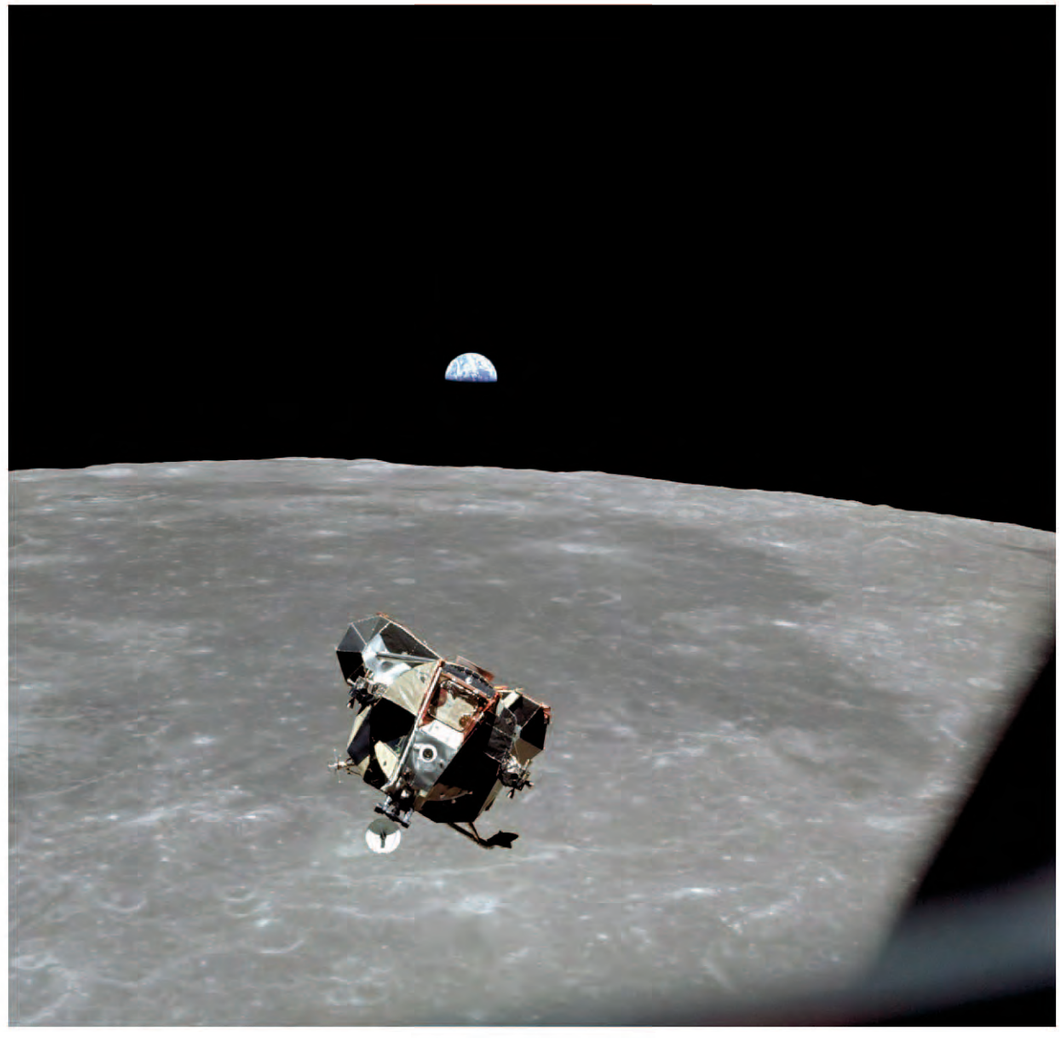
ARMSTRONG: YES, THE SURFACE IS FINE AND POWDERY. I CAN KICK IT UP LOOSELY WITH MY TOE. IT DOES ADHERE IN FINE LAYERS, LIKE POWDERED CHARCOAL, TO THE SOLE AND SIDES OF MY BOOTS. I ONLY GO IN A SMALL FRACTION OF AN INCH, MAYBE AN EIGHTH OF AN INCH, BUT I CAN SEE THE FOOTPRINTS OF MY BOOTS AND THE TREADS IN THE FINE, SANDY PARTICLES.

The Moon in the Living Rooms

On 20th of July 1969 Neil Armstrong made his famous step on the rocky surface of Earth's only natural satellite. The Mission was an enormous technological success itself. But the synchronous development of information technology was an essential aspect of the Moon Landing, too: the live broadcast made all the world being part of this moment of mankinds history.

The Project of a Generation

The moon landing fulfilled John F. Kennedy's claim from 1961 to reach the closest extraterrestrial body within a decade. Although the early rocket launch history of the United States was characterized by failure – the USSR cosmonaut Juri Gagarin was the first man in outer space – NASA finally succeeded in overtaking the Soviet Union thanks to an effort, that was promoted by the President and delivered by the whole nation. This lead to the victory in the so called "Space Race": Being first on the moon.



Moon Landing Mission Apollo 11
20th July 1969
Crew: Neil Armstrong, Buzz Aldrin and Michael Collins
Mission Duration: 8 d 03 h 18 m 35 s
Lunar Surface Time: 21 h 31 m 20 s
Rocket: Saturn V (h=110.6 m; d=10.1 m; w=3039 t)

The Reception of Space

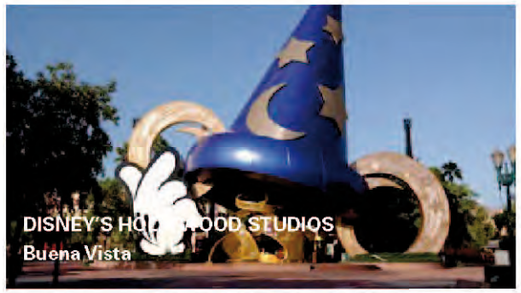
With the lunar landing, the race to the moon ended. Until 1973 NASA flew up another five missions. After the Apollo Program NASA initiated with the Space Shuttle program the next manned launch vehicle. As a reusable space ship it was meant to be more cost efficient, which in review didn't succeed. Its first launch was on the 1st of April 1981 and was followed by 132 further missions. Especially in the early years of Space Race, NASA's imaginary was a global novelty and the image production was elaborated. They focused not only on the launches and the missions, but also on construction and research. In the past thirty years the Space Shuttle programm produced an enormous amount of pictures showing starts and the research in a more documentary and less dramatic way: a certain exhaustion of virtual reality production.

Theming and Banalization

On the area of Kennedy Space Center, 1967 the Kennedy Space Center Visitor Complex was dedicated. The park advertises among others the "Rocket Garden", an exhibition of different types of rockets from the past fifty years, the "Apollo/ Saturn V Center" where one of the two remaining Saturn V rocket is exhibited and a small piece of moon can be touched, the "Lunch with an astronaut" for 25 $, IMAX® theaters, where "you can feel the thrill of space exploration" and interactive space flight simulators. The visitor complex does not evoke an historical pathos or memorial but is attracting with adventure oriented theming.

17'233'000 visitors

10'490'000 visitors



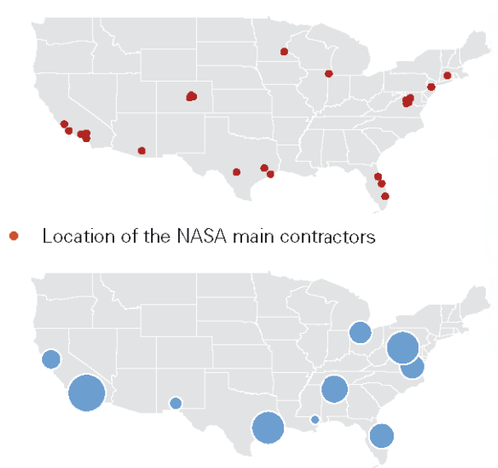
9'700'00 visitors

1'600'000 visitors

KSC Visitor Complex: A Theme Park

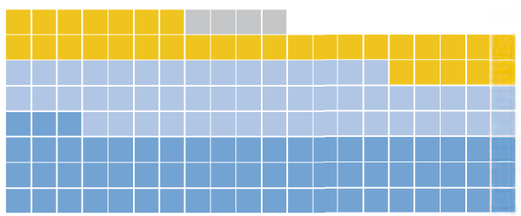
Kennedy Space Center Visitor Complex can be understood as a theme park among others. Its importance for Florida, where 8 of the World's 25 most visited theme parks are located, is relatively small.

"Tour Destination Map", Kennedy Space Center



Location of the NASA main contractors

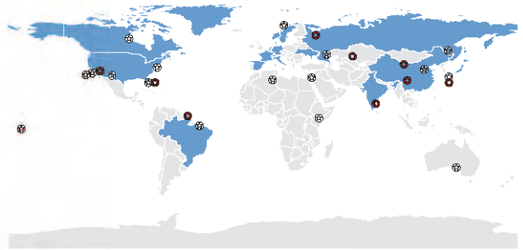
NASA Centers and Laboratories in relation to their direct employee number



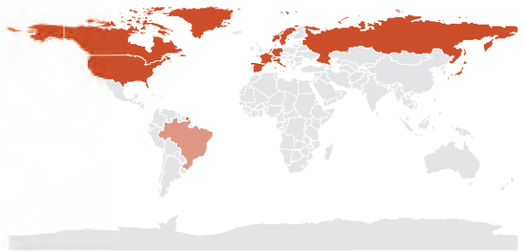
Others
Civil services & Space related wages
Technical, Engineering and Construction
Scientific research & Development services
$10 Major Commodities at KSC

NASA Research

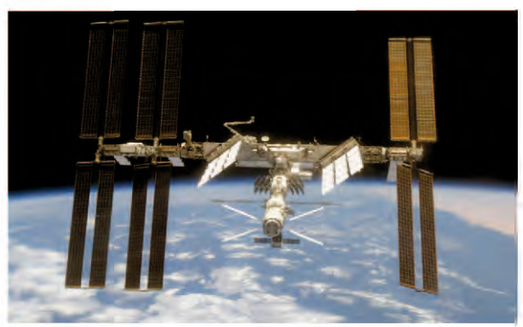
Compared to entertainment related to space the more important part of NASA's spending is for research and space exploration. This business is nation wide and even globalized - NASA facilities and the contractors are spread in clusters all over the U.S. The Kennedy Space Center mainly acts as its entertainment flagship.



Countries with space programs and launch facilities



Countries participating in the ISS



Globalized Space Exploration

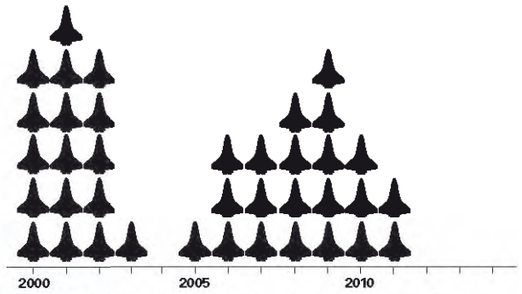
Since the 80s most space programs are multinational collaborations. The unification of these efforts allowed projects like the ISS but did not radiate a pathos comparable to the Space Race

Cape Canaveral

From the very beginning of Space Race, Cape Canaveral was the preferred site for space exploration in the United States for various reasons: the proximity to the equator on an physical level, the connection to the mainland on an infrastrucutral level, the loose existing settlement on site on a socio-political level and the position on U. S. eastern coast, concerning the earth rotation, on a safety level, permitting to launch over open sea instead of populated areas.

Kennedy Space Center

For the lunar mission engineers developed the oversize Saturn V rocket and bigger launch facilities were needed. In 1958 NASA was separated from the U.S. Air Force. North of Cape Canaveral they obtained the Merritt Island area and started the construction of their installations in 1963. The Kennedy Space Center consists of the Industrial Area, the Vehicle Assemblage Building, the Launch Complex 39 and the KSC Visitor Complex. NASA launched manned space crafts at Kennedy Space Center for more than 30 years.



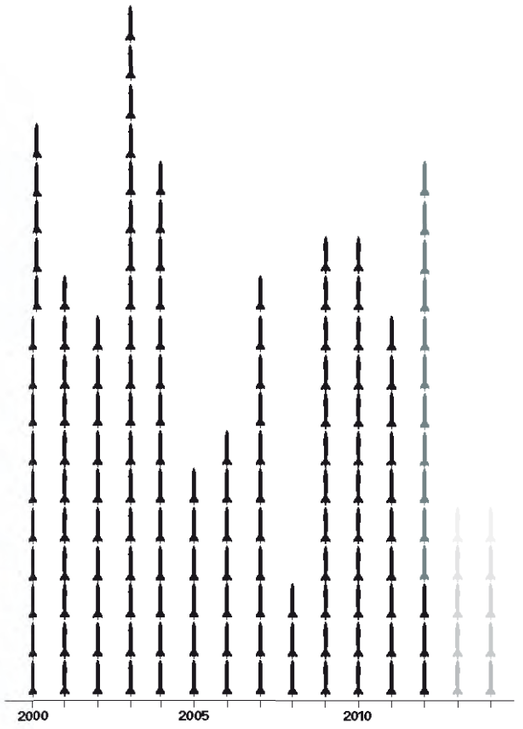
Manned Launches per Year from Kennedy Space Center

End of Manned Space Flights

The end of the Space Shuttle program has been planned in a longer term. Nevertheless, President Obama is blamed by newspapers and publicity for the shut down and the uncertain future for a lot of direct and indirect effected Jobs. In fact, under the Obama government NASA was subjected a fundamental reorientation: Privatization. Because of that, the President cancelled the Constellation program.

Cape Canaveral Air Force Station

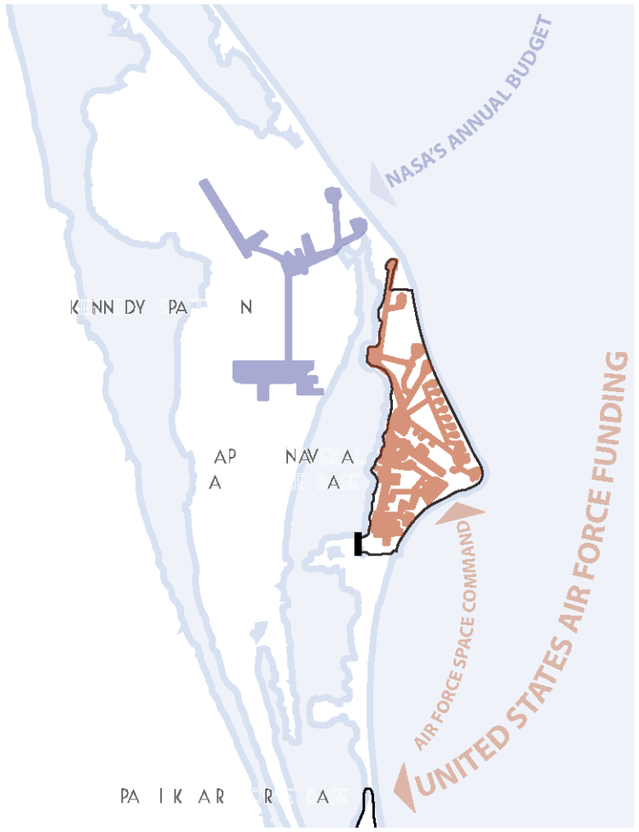
Cape Canaveral Air Force Station was used as a military airport during WW II and changed in the 50s to the prime site for U.S. Army rocket launches. Today it is a busy launch site used by the U.S. Air Force and by private companies for unmanned launches, military tests and satellites. It is closed to public. The private funded rocket launches are a prospering business at Cape Canaveral Air Force Station and due to officials, future space exploration will be financed even more by private entrepreneurs.



Annual Launches on Cape Canaveral Air Force Station

Cape Canaveral Industrial Area

- U.S. Air Force
- Lockheed Martin
- Boeing
- National Aeronautics and Space Agency

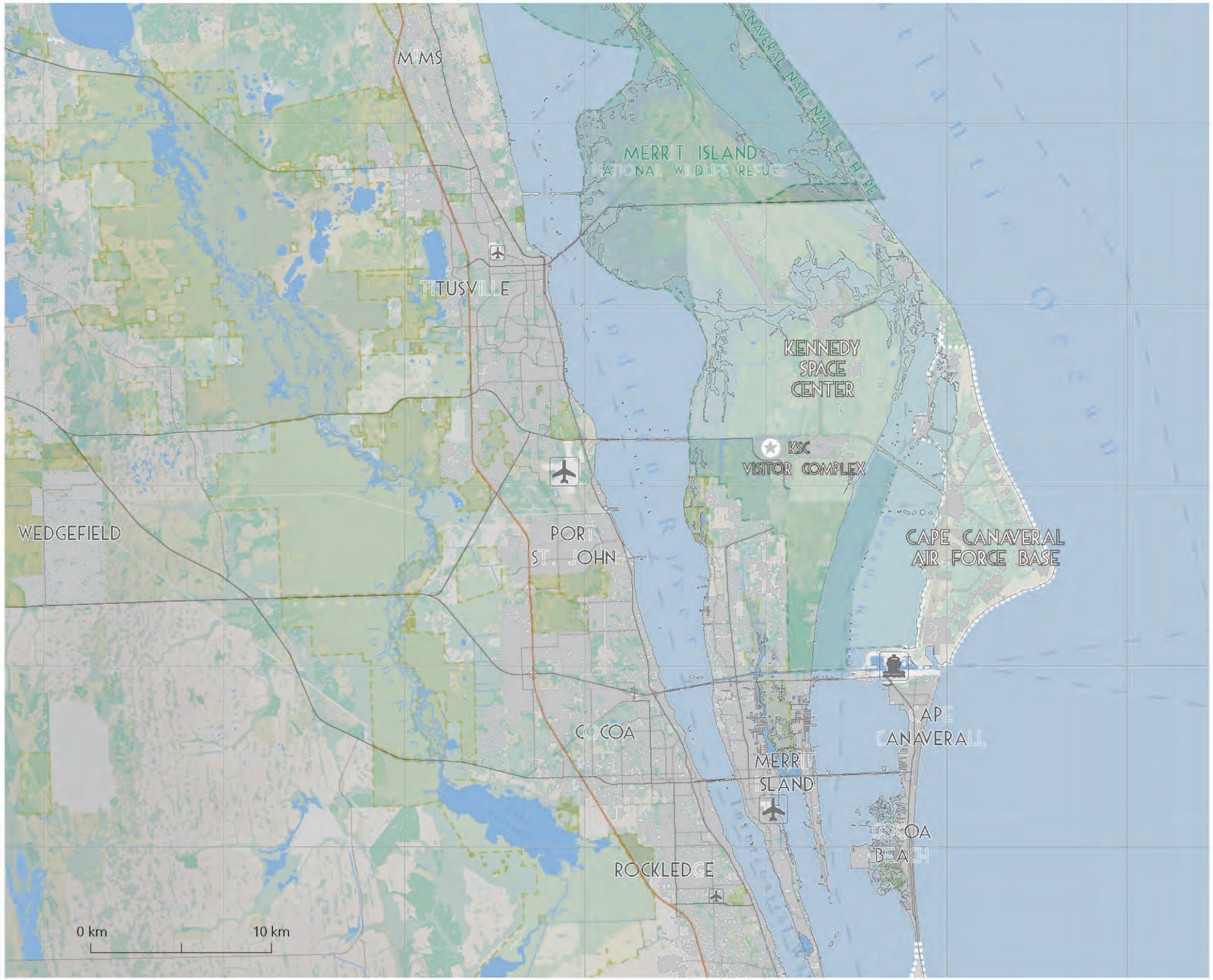


The Independence of Federal Areas

NASA was emancipated from the U.S. Air Force by the National Authorization Space Act in 1958. Since then, the entities coexist in nearby situation.

CONTROLLED SPACES

While "Cape Canaveral Air Force Station" is a closed, hermetic controlled island, the borders of "Kennedy Space Center" have less physical presence. Even where a formal border is defined, the open space is the dominant element of physical access control on Merritt Island. The understanding of open land as a border and the use of nature as an abstract buffer are methods in handling nature, which can be observed on an even smaller scale on Merritt Island but also as a large scale phenomenon on the mainland. On Merritt Island, nature is formed by technical interventions to improve the conditions on site for the NASA's employees. On the mainland, open space was covered by the Jefferson Grid in 1785: a field typology for a number of players on different administrative levels with varying degrees of control. This leads, in conjunction with topography and geology, to a limited area for potential settlements and hence a clash of interests.



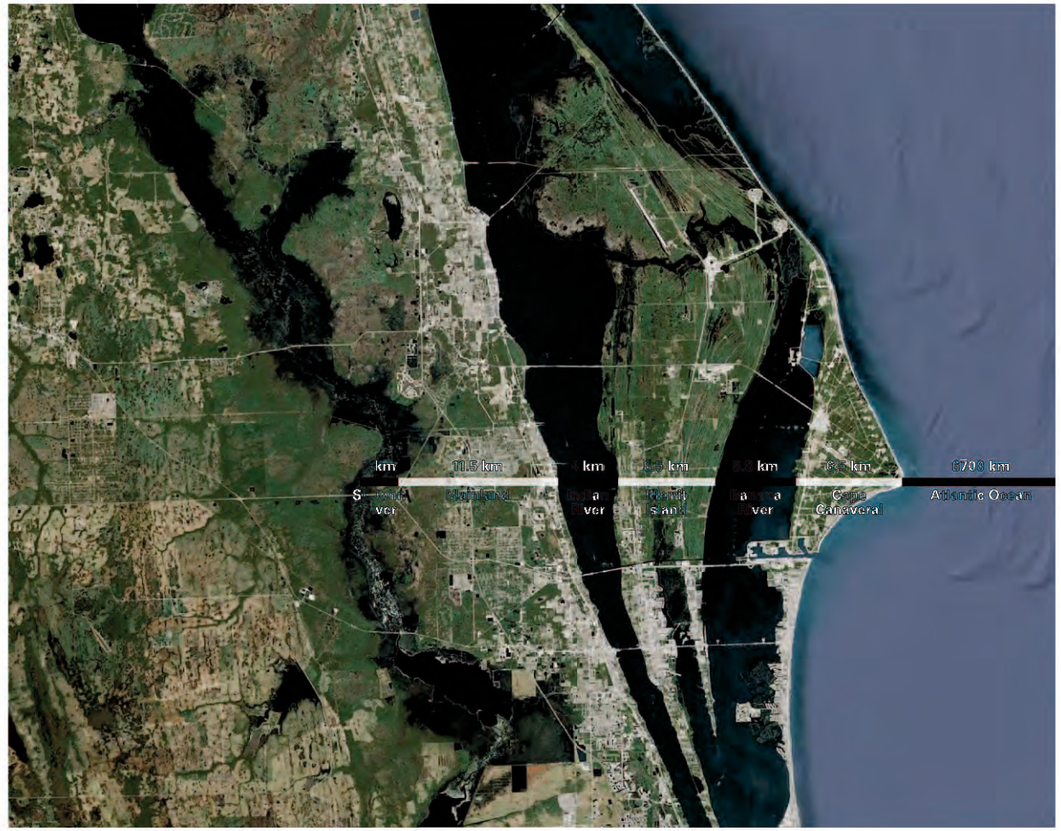
Restricted Area
Nature Preservation on the Mainland
Nature Preservation on Merritt Island
Urbanized Area
Airport and Harbour
Forest
Wetland
Agriculture

Greater Cape Canaveral Area

A system of barrier reefs spreads out in front of the mainland of Florida. At Cape Canaveral and Merritt Island this linear system widens up resulting in a flat system of wetlands, lagoons and the mainland. St. John River follows the coast northwards in a distance of around 10 km parallel to the lagoon shore. Both, the reef and the mainland is fractional urbanized.

Morphology of the Cape

Horizontality and wideness dominate the perception of the landscape. Width can be understood in the direction of the Indian river but also in the strip-like array of the lagoon, the island and the reef – The distance from St. John river to Cape Canaveral is about 23km.



Limestone
Shelly Sand and Clay
Medium fine Sand and Silt

Geology of the coast

The coastal barrier consists of shelly sand and clay. Only in the areas of Cape Canaveral and the eastern middle of Merritt Island, which was chosen by the U.S. Air Force Army and NASA for rocket launches, the soil is compounded by medium fine sand and silt.

Waterbody

The barrier island creates a variety of waterbodies with different qualities of water, which depend on rain and wind, but also on man-made inlets and natural freshwater inflows.

Wetlands

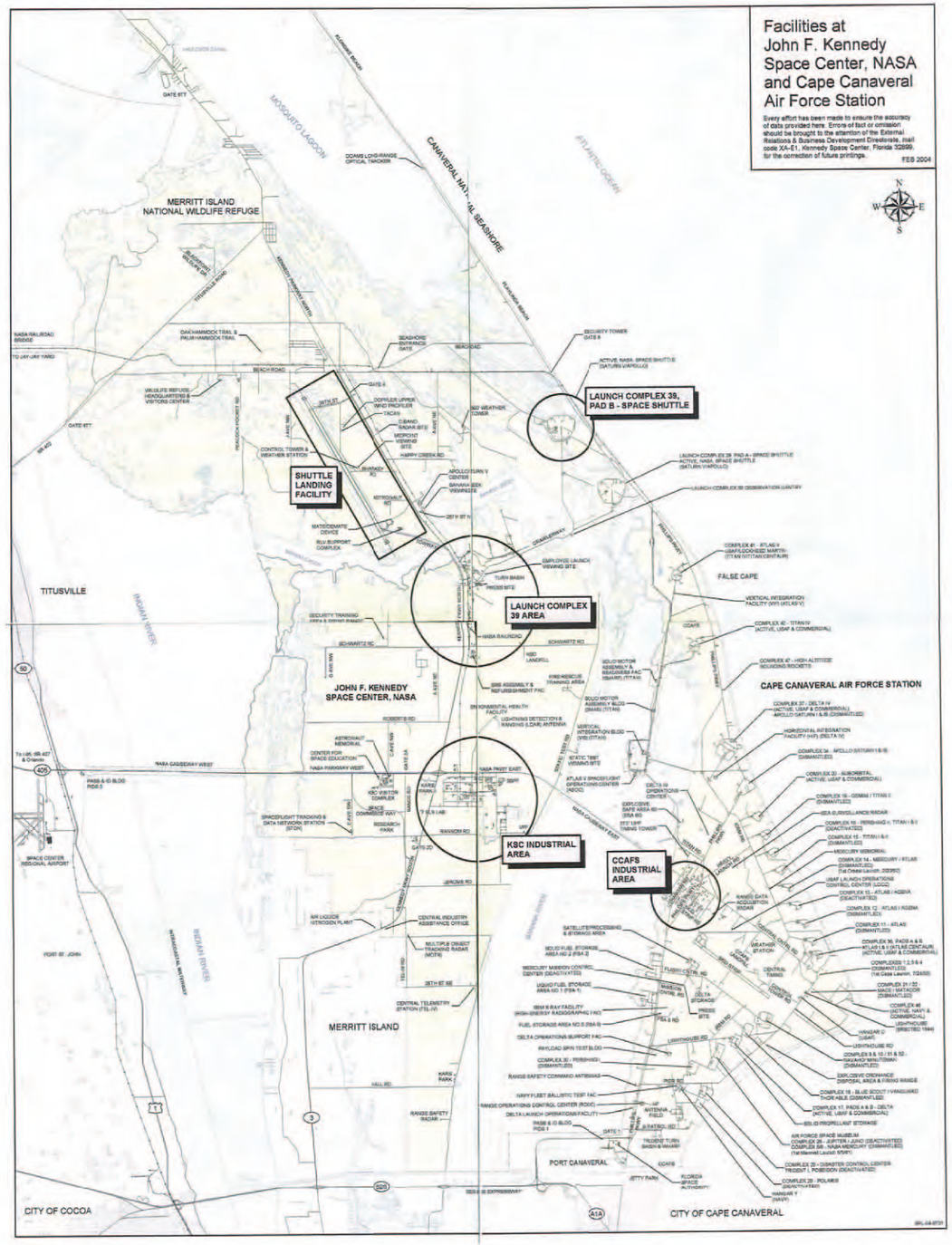
Wetlands include different types of landscape: tidal salt marshes, mangrove swamps or freshwater marshes. The term "wetland" is defined by the moisture content of the soil.

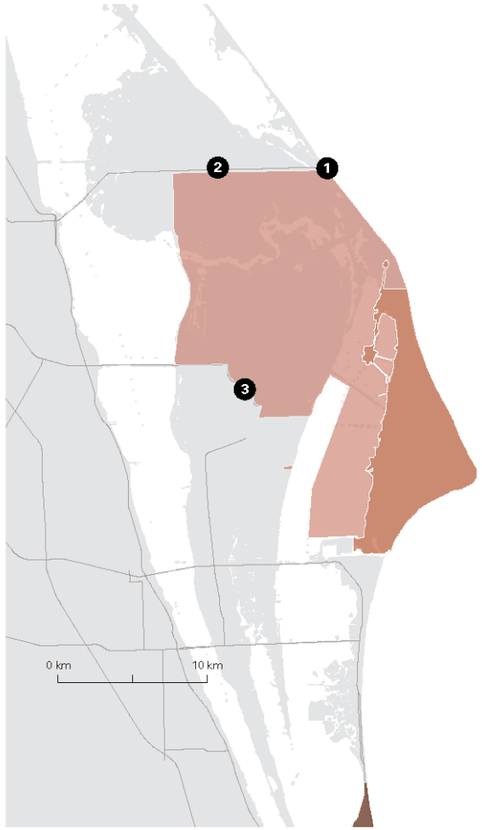
Uplands

Due to the geological structure and the natural conditions, the actual upland is the remain of waterbody and wetlands. Thus the landscape is highly defined by these elements.

Impact on Site

Merritt Island, a landscape formed by the permanent influences of wind and wave, is initially characterized by freshwater inlets and salt marshes. In 1962 the NASA bought 570 km² of land and started constructing gigantic launch facilities for the purpose of lunar landing. This interventions totally changed the landscape.





Kennedy Space Center
Cape Canaveral Air Force Station
Patrick Air Force Station

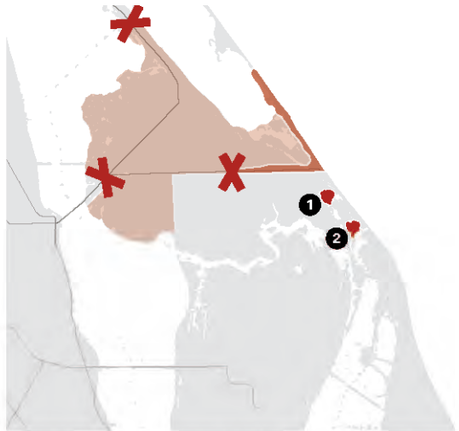

1

2


3

Restricted Areas

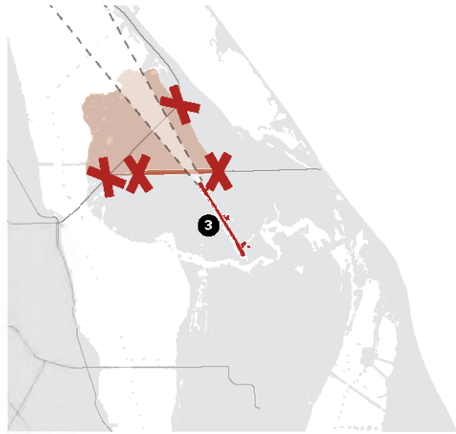
Cape Canaveral and Merrit Island are characterized by specific borders. The Cape Canaveral Air Force Base is as a military area and therefore has a strong physical border with surveillance and armed control. On the other side, on Merritt Island borders are formally defined, but the lines are rarely articulated on site. NASA's control is of a passive quality. The land is owned by the federal authority and is dispensed for management purposes to different players.



1, 2 Launch Pad 39A and Pad 39B for Human Space Flight
3 Days before Launch
24 Hours before Launch

Launch and landing experience

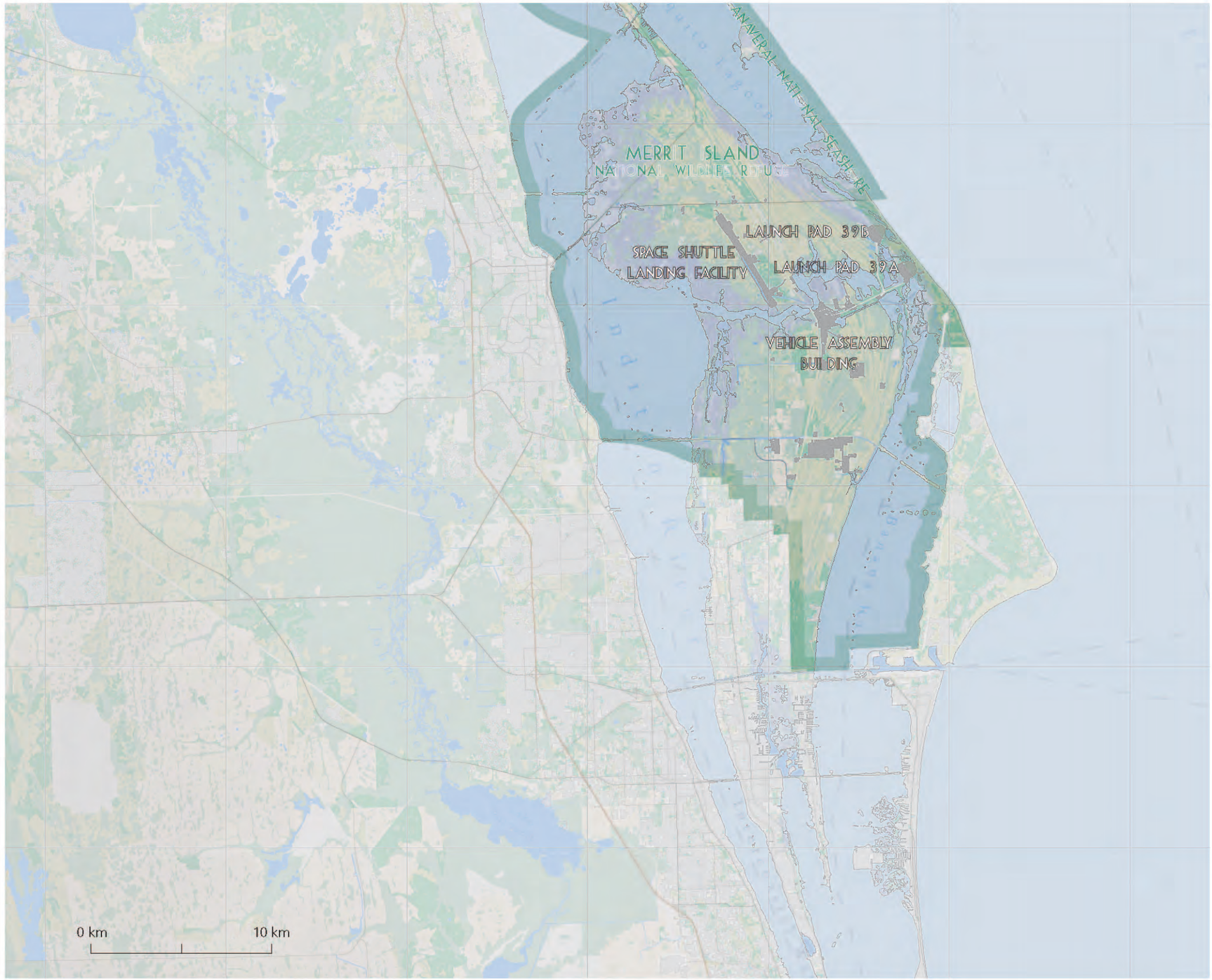
On launch day, there are several 100'000 visitors on site to watch the launch. For safety reasons, the streets to Merritt Island are closed to public due to their location on different dates.

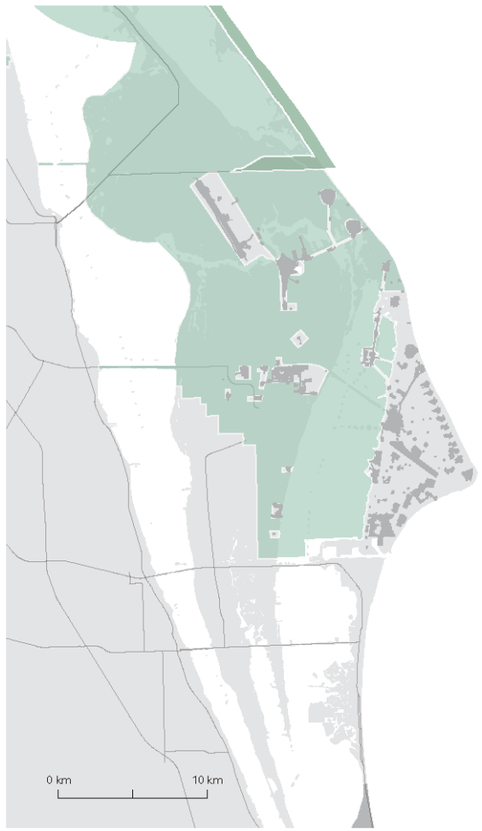


3 Space Shuttle Landing Facility
24 Hours before Landing
1 Hour before Landing

Natural Buffer

The federal facilities on Merritt Island are surrounded by 570 km² of various costal habitats including beaches, forested and non-forested wetlands, estuarine waters, impounded wetlands and upland shrub lands and forests. By 1962, after the NASA purchased the land, northern Merritt Island was deposited as security and safety buffer zone. Based on this, the biosphere remained the only unbuilt barrier island of the coast.





Merritt Island National Wildlife Refuge
Task: Biodiversity and Species
Canaveral National Seashore
Task: Preservation of scenic, natural, historic Aspects
Launch Facilities

Nature Preservation

Merritt Island's position in between Indian River, Banana River and the Atlantic ocean, thus the mixture of different qualities of water and salinity and the overlap of continental and subtropical climate led to an extraordinary biodiversity: with approximately 2'100 species of plants and 2'200 animal species the lagoon is the most diverse estuary in North America.

Merritt Island National Wildlife Refuge

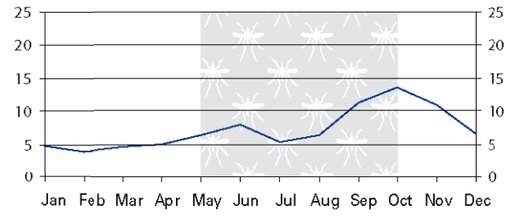
In 1963 the refuge was established by a management agreement between NASA and the National Wildlife Refuge System Service. The prime purpose of Merritt Island's lands and waters is to enable the space program and secondly to serve the refuge. The purpose of any refuge of the Wildlife Refuge System is the management of the territory with the focus on preservation and enlargement of biodiversity.

Canaveral National Seashore (US National Park)

The Canaveral National Seashore was established in 1975 on land which was already either being managed by NASA or by MINWR. The National Park Service took over responsibility of Playalinda Beach and some areas further North. This led to complex pattern of management and ownership distribution today. The prime purpose of National Park Services is the protection and preservation of scenic, historic and natural aspects in order to create an accessible, attractive American history.

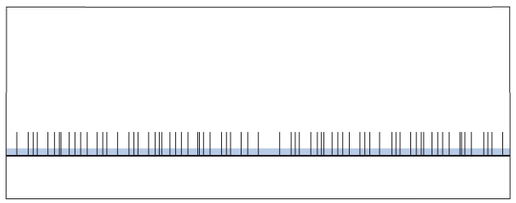
Engineered Nature

Regarding its natural condition the landscape of the barrier was not an ideal platform for the lunar mission. Therefore, the agency had to redesign the surrounding. Besides the struggle of constructing the launch facilities on the small edge of medium fine sand and silt on Merritt Island they also had to cross the Indian River and the salt marshes of Merritt Island in order to connect the reef and the mainland. The presence of salt marshes caused another problem: during summer and fall, the mosquito breeding season, NASA's employees were disturbed by an immense number of mosquitoes, which made work impossible. For that reason, NASA had to search for techniques to get rid of the dangerous insects, spreading disease like Dengue fever and Malaria.

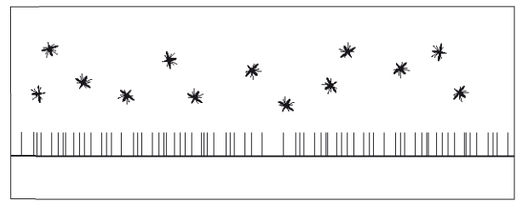


Mosquito breeding season

Seasonal tidal amplitudes in the Banana River in Inches per month



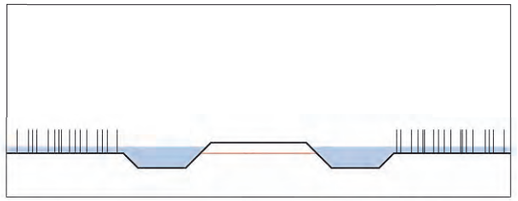
Winter time: Standing waters in the wetlands



Summer time: Mosquito breading season

Annual Mosquito Invasion

Merritt Island's climate, topography and geographical setting hatchery for mosquito breeding. In the salt marshes of Florida's east coast mosquitoes breed from May to October and create a drawback for men's health. Due to the fact that mosquitoes are not able to breed on standing waters, mosquito control by hand-dug dikes began along Indian River Lagoon already in the 20s of the last millennium. The improvement in chemical industry and the development of DDT and other pesticides led to a shift in technique: by the early 50s mosquito control in the area was almost exclusively done by chemicals. But already 1955 mosquitoes became resistant against the pesticide control became a problem and led to recall upon the mechanical techniques.

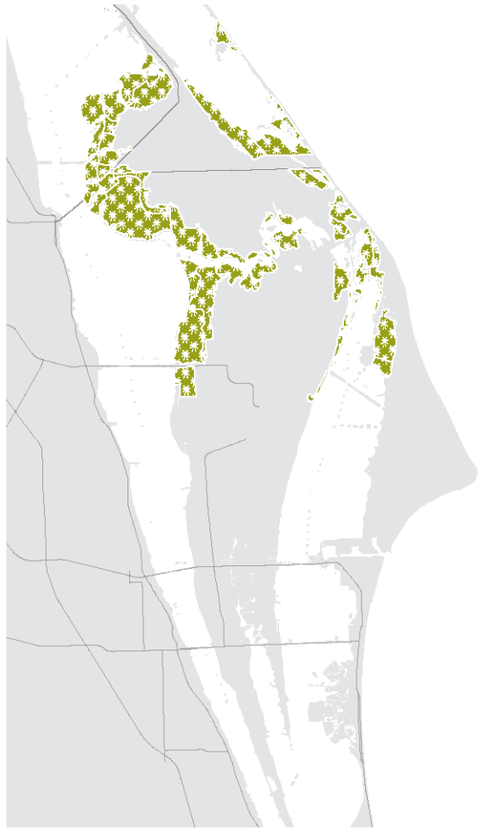


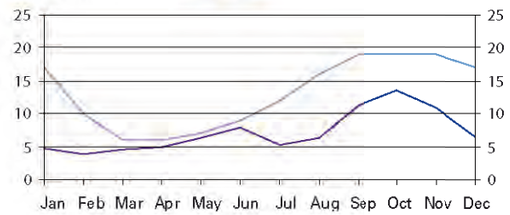
The dikes create pounds, which can be flooded all the year and make it impossible for mosquitos to breed.

In early years, ditches were graved by hand. The digging was formed to dikes.

Mosquito control

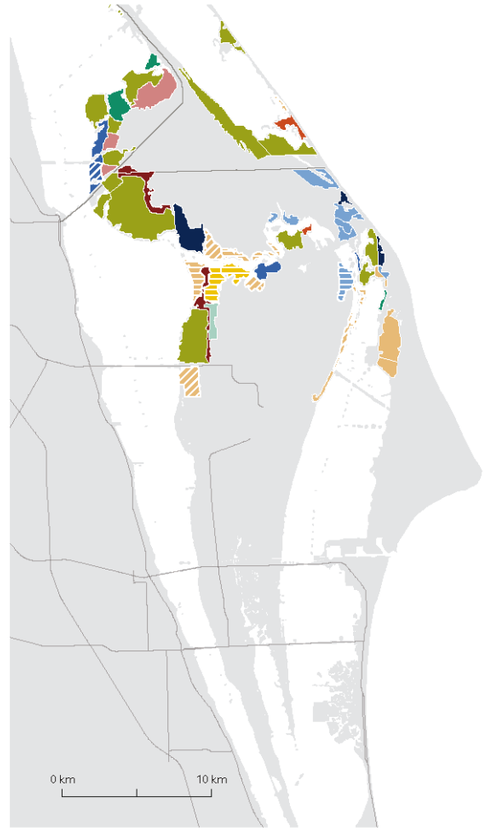
The dikes on Merritt Island were constructed by the U.S. Army Corps of Engineers in the early 60s to control the breeding of salt marsh mosquitoes and on the other hand to make the land accessible for surveillance issues. By flooding the diked compartments with freshwater and keep them flooded year in, year out, mosquitoes breeding was suppressed. The intervention also had consequences for the habitat. As the flows of nutrients and the movement of species is blocked the biotope nowadays is disturbed: the water quality diminished, the biodiversity sank or at least the pattern changed.





Species management

Today, Merritt Island National Wildlife Refuge is managed by the Refuge Service. The Refuge focuses on preservation and enlargement of biodiversity. On 570 km² over 500 animal species and over 1,000 species of plants coexist. In order to increase the biodiversity, the water level in the impoundments are warily controlled to offer a various range of pounds – from dry to wet to flooded pounds throughout the whole year, not bothering the changing biodiversity pattern. Today there are tendencies to restore some impoundments, as researches showed that also non-mosquito-breeder marshes were diked.

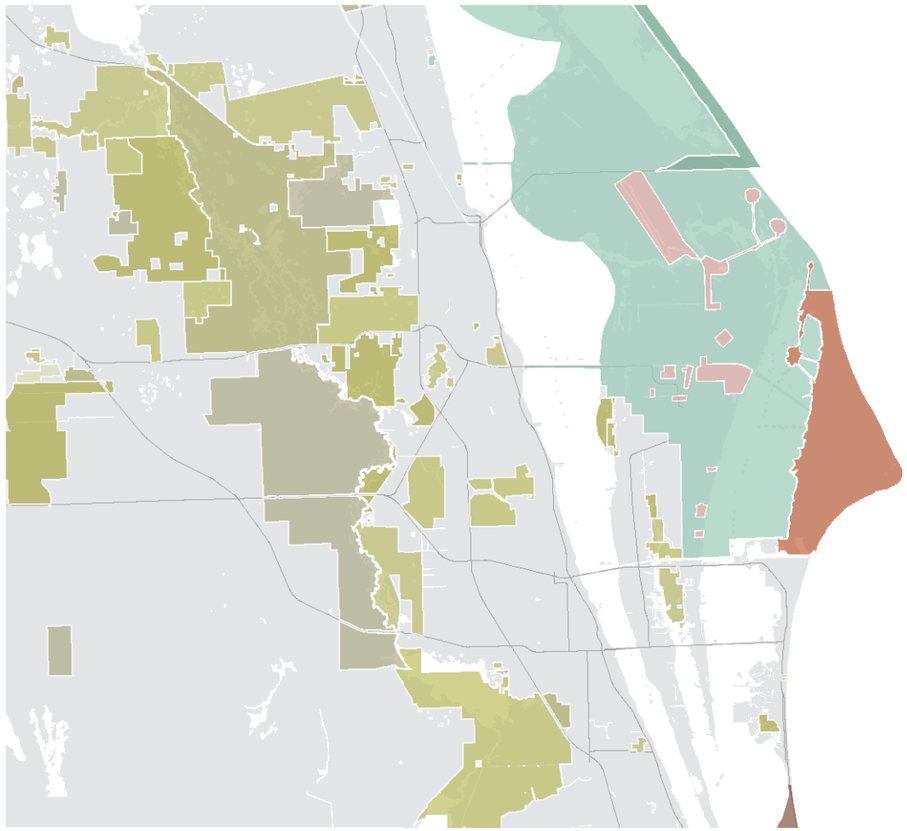


MINWR annual visitors: 650’000

KSC annual visitors: 1’600’000

Visitor facilities

Although the primary purpose of Wildlife Refuge Systems is not to attract tourists but to focus on biodiversity, the ref uges are partially open to public, if this use does not bothe the wildlife. The existence of drivable dikes in Merritt Islanc Wildlife Refuge makes the landscape accessible for bird watchers, anglers and also hunters.



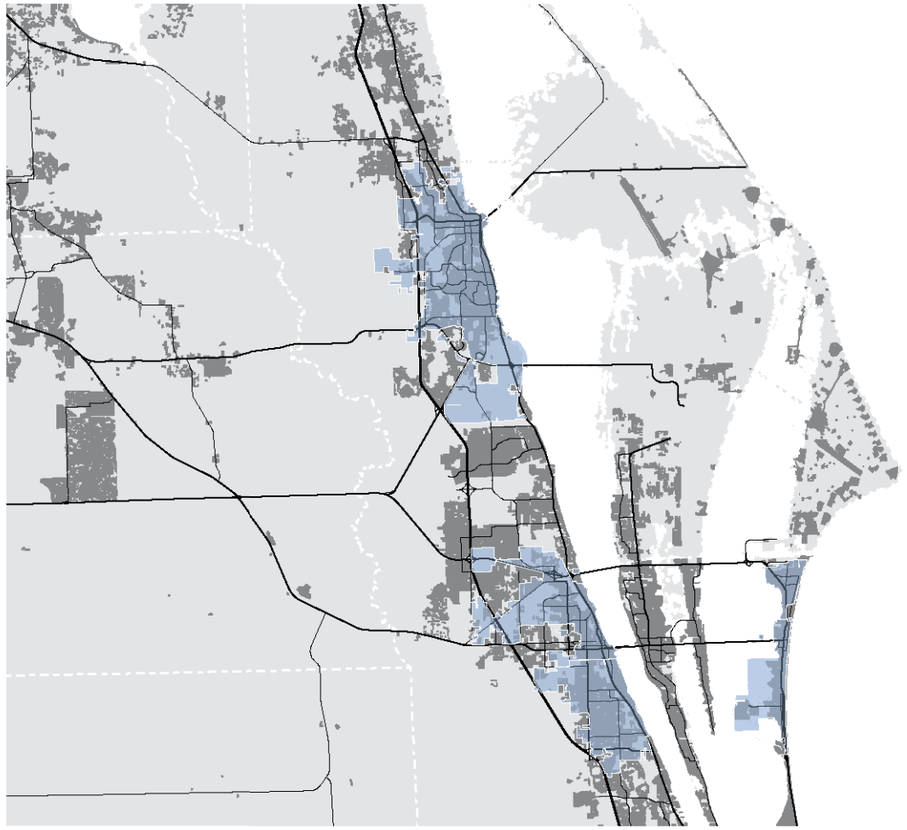
Kennedy Space Center
Cape Canaveral Air Force Station
Patrick Air Force Base
Merritt Island National Wildlife Refuge
Canaveral National Seashore
Managed area with conservation purpos

Areas with conservation purpose

Along St. John river the natural environment is devided in compartments of conservation which are managed either by state, county, local or private authorities.

Administrative Entities and Competetive Urbanization

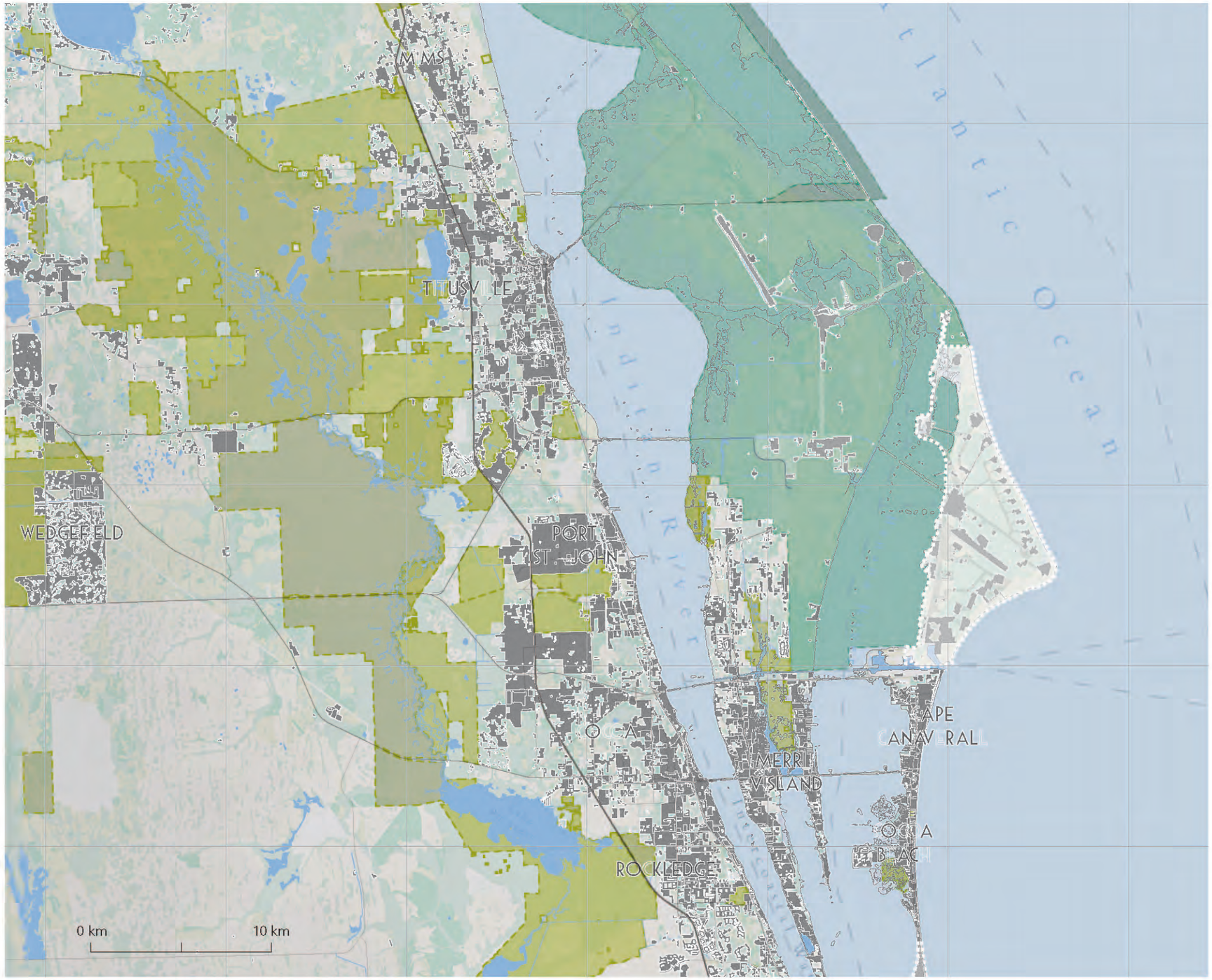
On Merritt Island and on Cape Canaveral Island the territory boarders are relatively stable. The players are permanent, the goals are of a long-run nature though the area is controlled by different means. Opposing the lagoon, on the mainland the condition of land control is different. The various entities on different political hierarchies, have changing short-term and long-term goals. On the smallest scale land ownership changes comparatively quick and the real estate market therefore is competitive. Different processes and mechanics take place in the same time and overlap.



Urban developement
Cities
County Border

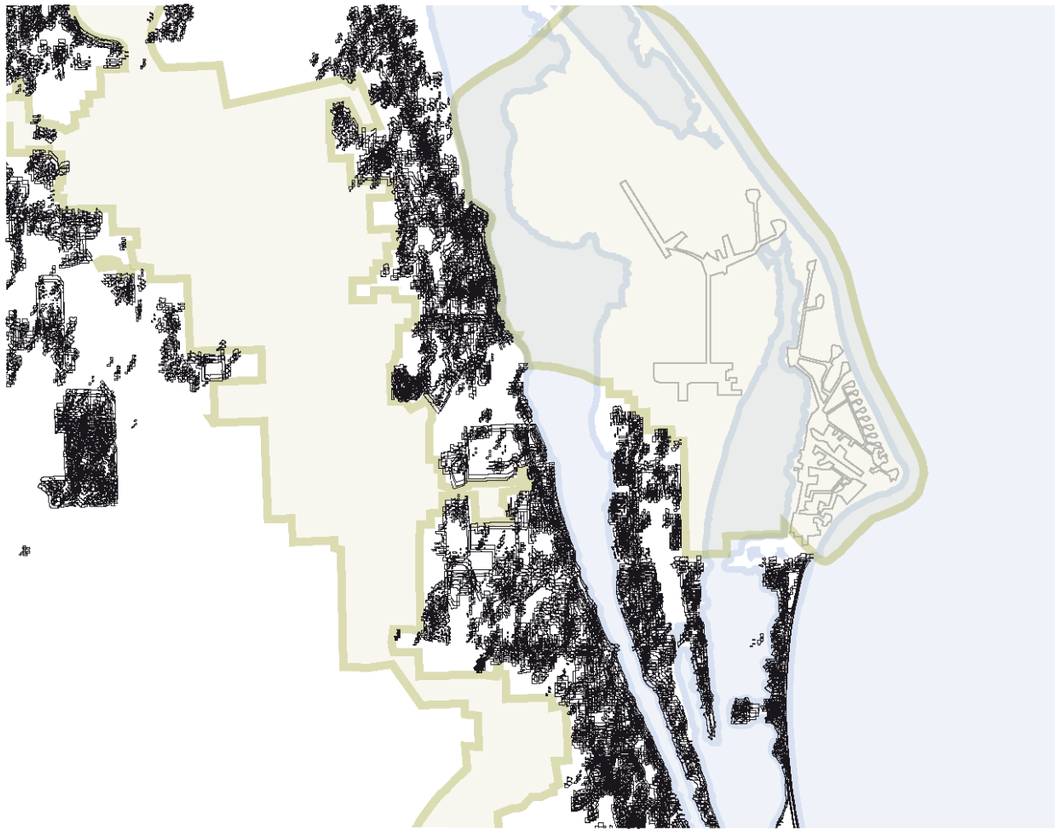
Cities and urban built up

In Brevard County, municipalities are growing. The law enables municipalities to annex a willing community into their territory concerning a certain density. This causes a competitive growth of the cities. The consumption of land due to private building activity is neither controlled inside nor outside city borders.



Urbanisation in Brackets

The mainland facing the Indian River lagoon is in a special situation: It is restrained by federal, state, local or private governments with environmental conservation or military purposes. Cape Canaveral has an insular status, not just because of its geographical position but also because of the military purpose and is therefore controlled by access. Kennedy Space Center is controlling their area by surveillance and by the distance but is neither taking direct influence on mainland. The settlement is on one side bordered by the landscape, the Indian River, which forms a natural buffer for NASA's territory. On the other side, the conservation areas surrounding the St. John River suppress a development westwards. In comparison only the conservation areas block the urban sprawl. Municipalities have hardly any influence within the competitive system of urban development.



Static Nature and Vibrant Urbanisation

The authorities taking care of environment are by nature interested in long-running processes. The "gentle giants" are the determinating edges for the rapid and reckless building activity within the cities and Brevard County.

DEPENDENT SHORE

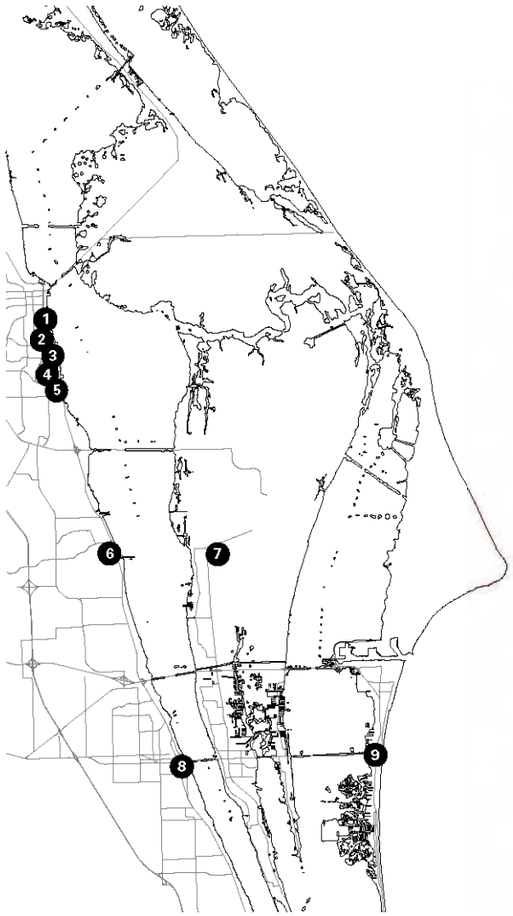
NASA's long-term engagement in the region of Cape Canaveral had an enormous impact on a multitude of neighbors. While in the past the federal agency took direct and indirect control to reinforce their interest, there exist a countless number of players which were, are and will be dependent on NASA's decisions in past, present and future. The economic importance and investments of several billion dollars per year in the surrounding area led to an economic dependence, but also a visual omnipresence of NASA, fostered over forty years throughout the manned space programme. The suppliers of NASA – the region, municipalities but also a countless number of private shopkeepers and restaurant owners – have to react on these large scale political decisions. Most of them have neither the economical strength, the political power nor the touristic attractiveness to influence the mechanisms decisions related to Space Explorations.

The Struggle of Titusville

Titusville is the first city on mainland driving from Merritt Island and Kennedy Space Center westward. The location aside the Indian River was in early American history an economical advantage and made the young community grow and prosper. Since 1850 the barrier reef enabled ships to boat savely on the Indian river. In the early 50s, when Air Force started rocket launches at Cape Canaveral and built up the Patrick Air Base even further south, the former fortunate strategic position was weakened. When long distance transportation started and the highway system was developed Titusville lost its position as a costal hub. NASA's engagement from the 60s onwards made Titusville win importance as a bridgehead. Titusville became, among other municipalities in Brevard County, a bedroom community for NASA employees but also a ideal site for NASA contractor's. The location on NASA's lifeline and the profit out of this neighborhood led to a certain dependency of Titusville. The end of Space Shuttle program in 2011 therefore will affect these places in the backyard of the NASA.

Orlando's Dead-End?

Arriving Titusville from Orlando leads over a four lane highway to an two lane dead-end with a pitoresque building owned by the municipality's storm water control.



Iconographic dependence

The long-term engagement of NASA on Merritt Island not just created an economical dependency. NASA's image machinery created both: An imagination in men's mind and an actual brand. "Space Coast" as a label is ubiquitous on the strips of Titusville. The space exploration as a symbol is then not connoted to a certain function but to the proximity of the Kennedy Space Center.

1 Moonlight Drive In, Titusville

2 Miracle City Mall, Titusville

3 Mc Donald's, Titusville

4 Steves Family Dinner, Titusville

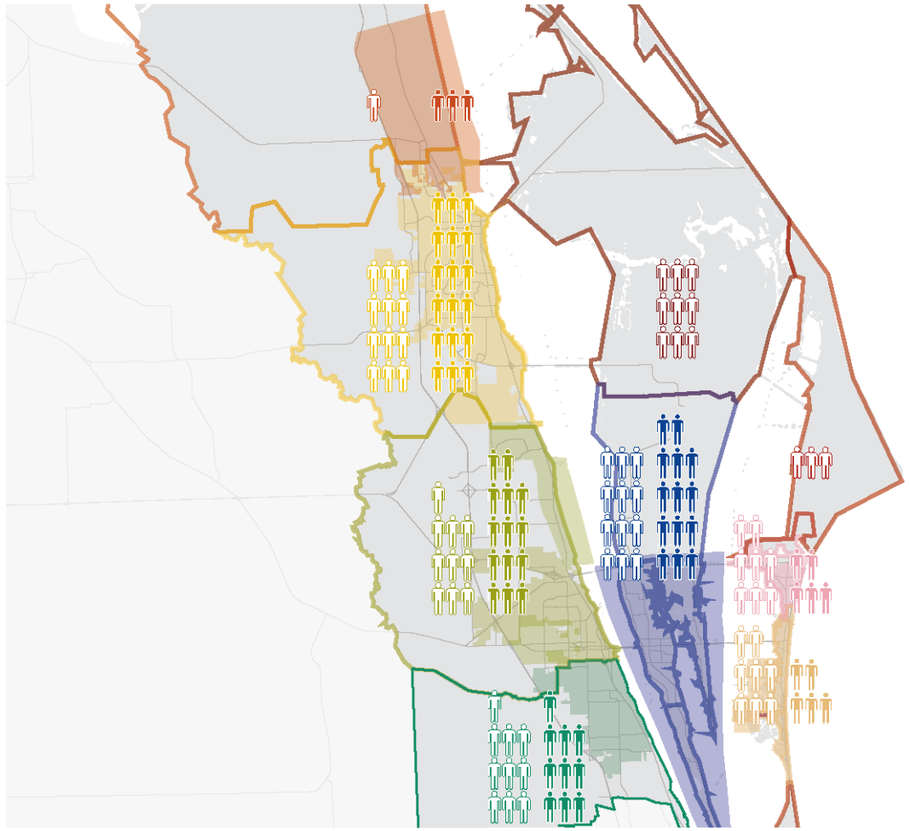
5 Kennedy Space Center Credit Union, Titusville

6 Mc Donald's, Cocoa

7 Space Shirts, Merrit Island

8 Fast Payday Loans, Cocoa

9 Sonic Lube, Cocoa Beach

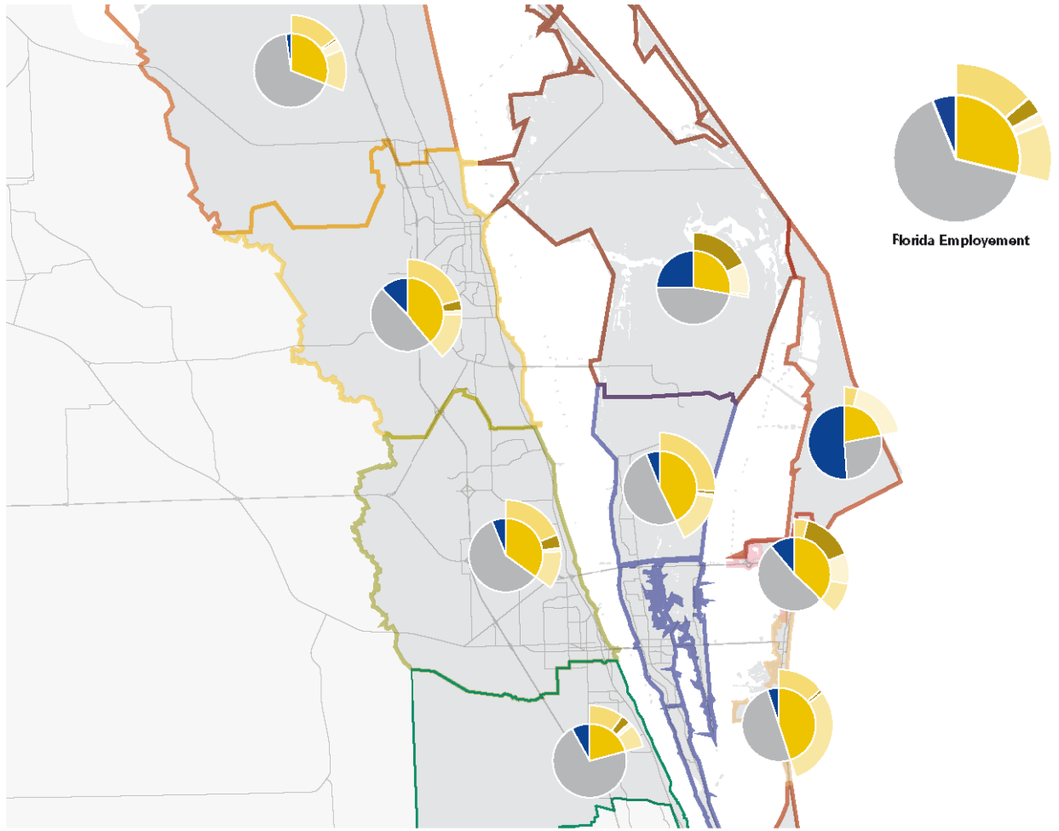


Sharpes
Titusville
Rockledge
Cocoa
Merritt Island

Jobs in 1000
Labor force in 1000
Kennedy Space Center
Cape Canaveral Air Force Base
Cape Canaveral
Cocoa Beach

NASA's economic Neighborhood

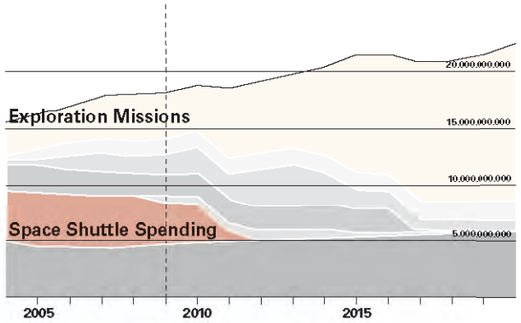
Different cities and authorities developed around Kennedy Space Center and Cape Canaveral Air Force Station. Their geographical position created conditions, which are relevant for their economic wealth. The on-shore municipalities Mims, Titusville, Cocoa and Rockledge are located aside Indian River in a relative distance to the beaches and are therefore facing different situations. Rockledge is the host for much of Brevard County's administration. The City of Cocoa is at the Intersection of Highway 95 connecting North and South and State Road 528, the so called "Martin Andersen Beachline Expressway", connecting Orlando to the shore. Titusville's bridges connect Northern part of Merritt Island, the Kennedy Space Center and the Kennedy Space Visitor Center but also the Merritt Island Wildlife Refuge and Cape Canaveral Seashore to the mainland.



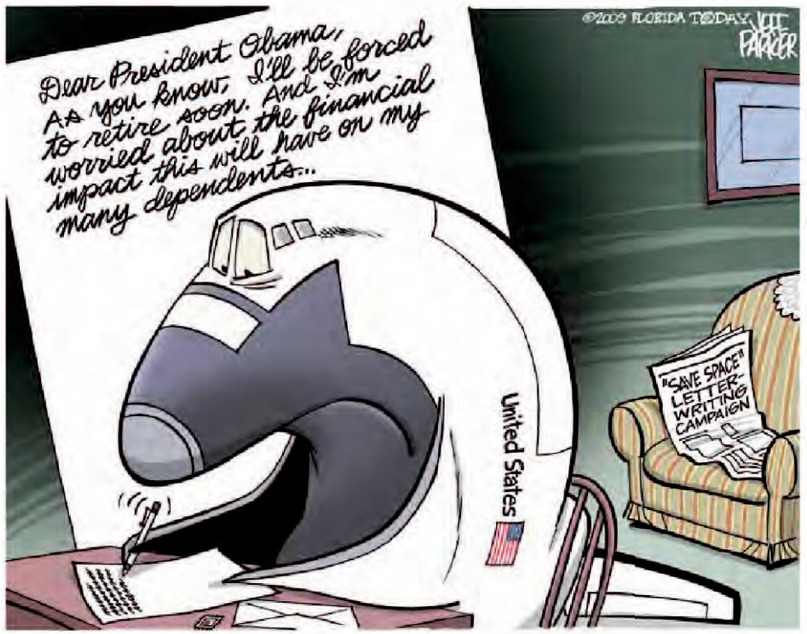
Tourism
Retail trade
Transportation
Arts, entertainment, and recreation
Accommodation and food services
Other Industries
Professional, scientific, and technical services

NASA's Commuter Towns

The settlements on the mainland are not just residential districts for NASA employees. In fact, NASA and the federal government directly only employ 2000 workman. The other employment is done by private contractors as the United Space Allience, which is also running the Kennedy Space Center Visitor Complex.

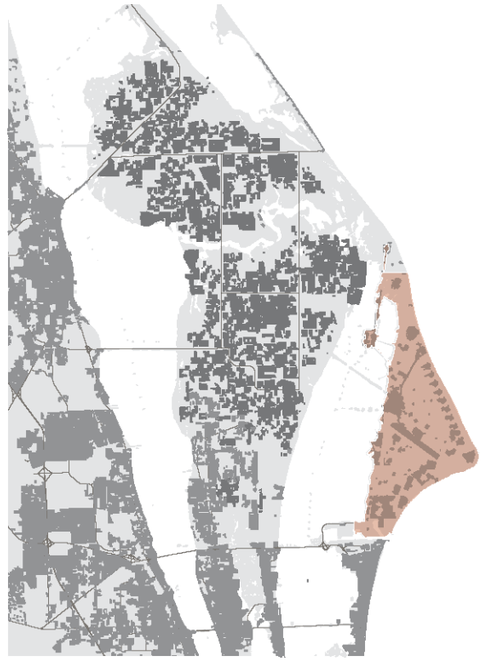


The developement of NASA spendings

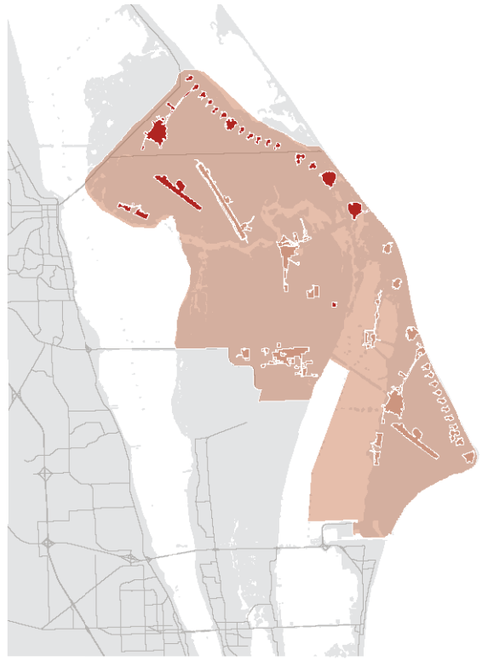


Post-Shuttle Scenarios?

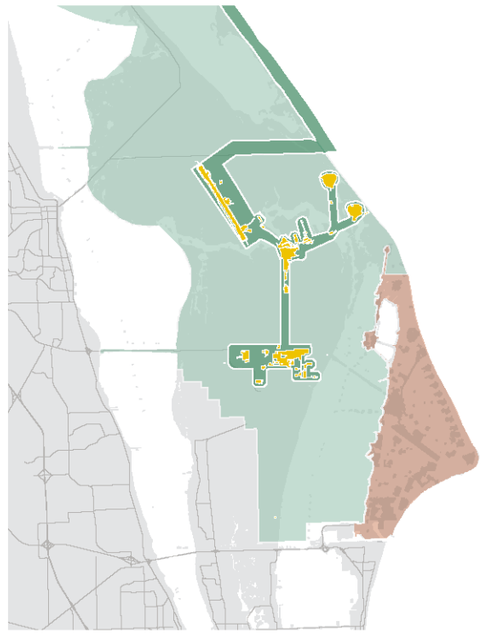
After 30 years National Aeronautics Space Agency is stopping the Space Shuttle program in July 2011. Publicity is frightened by the possible impact, decision by politicians could cause. In short term perspective, the close region will loose a huge number of direct and adjacent jobs; in the next few years between 7'000 and 12'000 jobs will be cut off by federal agencies. Each direct job reduction will cause the destruction of about 1.5 jobs indirectly related to space exploration in the greater area of Kennedy Space Center. Future scenarios can not be derived with a scientific certainty; nevertheless, scientists and local analysts try to imagine scenarios, which could happen. A much more probable scenario is the sea level rise by three foot. This scenario would have an major impact on the situation for barrier settlement all over Florida as well as for Merritt Island.



Scenario I: Major Sprawl all over Merritt Island

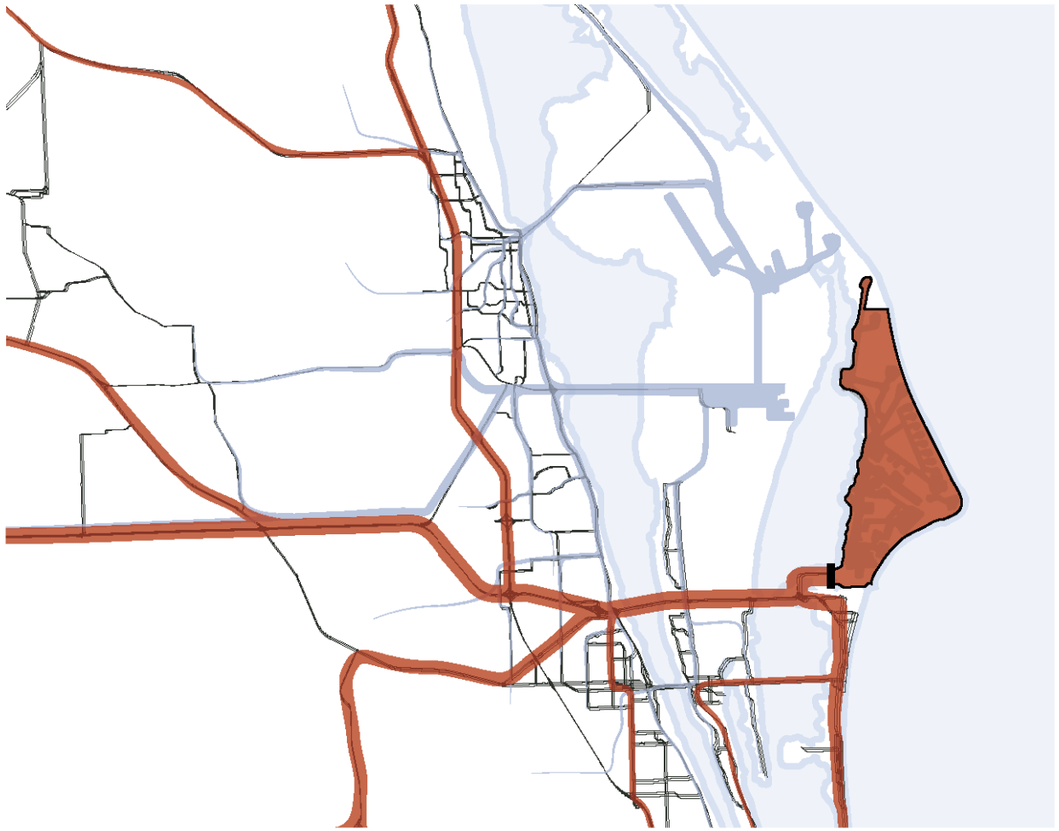


Scenario II: Expansion of Private Space Exploration



Scenario III: KSC as a National Monument under the Surveillance of the National Park System

Scenario IV: Sea level Rise by 5 Foot due to Global Warming without respecting erosion



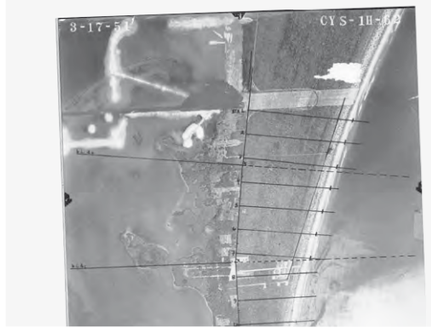
Circuit of Dependences

NASA attracted and created a local high tech sector but also evoked service facilities for their employees. Their need of workforce and supply, whilst spilling enormous amounts of money into the region, created a circuit of dependences from which NASA will exit in 2011 with one remaining Space Shuttle.

EMANCIPATED HINTERLAND

During the early years of the "Space Race", the U. S. Army had the need to build launch facilities and infrastructural links to Florida and to the United States. Important transportation routes were extended, widened, their capacity increased or simply built from scratch. The excellent infrastructure network, be it road, rail, flight connections or waterways, was not only contributing to the United States' victory of the Space Race but also encouraged tourists to visit the "Space Coast" and attracted high-tech enterprises, companies that in the early years had an affiliation with the NASA activities. With the economical upswing of the last decades, some of once economically dependent enterprises emancipated themself and created their own independent offsets and businesses, contributing with their premises to the generic development of the coastline urbanization.

1943: The untouched barrier reef



1951: The first interventions

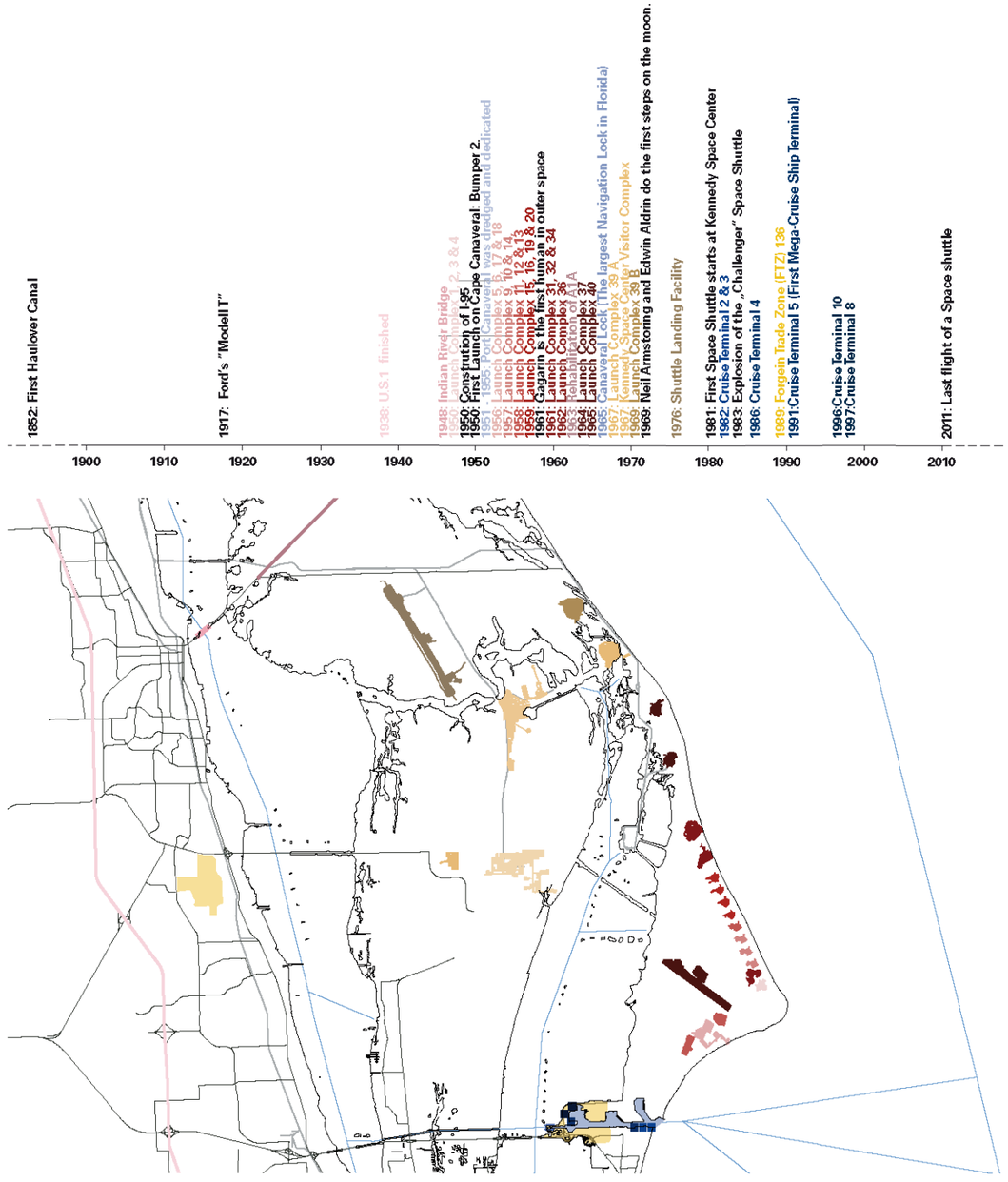
1969: Port Canaveral

1965: Canaveral Lock

1963: Rehabilitation of A1A

The Space Coast Port

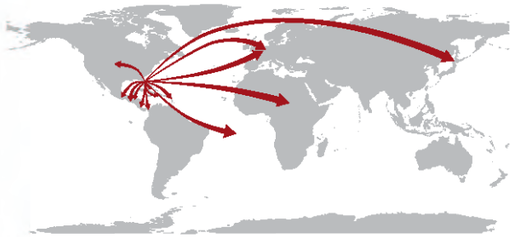
The first conception for a deepwater port at Cape Canaveral was done by the Navy in 1878. Congress granted the approval 50 years later in 1929. It took another two decades, until the dredging started. The dedication of the port was 1953 and primary for military and commercial purpose. This is just one of different infrastructure that was constructed in the time and area of first rocket launches.



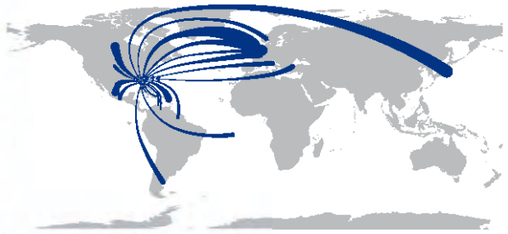
Shift of Intervention

The infrastructures where either constructed for launch activity or to support these. At Port Canaveral for example, Space Shuttle's external tanks are boated to the Vehicle Assembly Building. In 1964 the first cruise ship arrived at Port Canaveral and ushered in a new era. The first cruise terminal was built in 1982 and henceforward the cruise business grew rapidly. Today, Port Canaveral is one of the busiest cruise Ports in the World.

$178.4 Million annual Income



Port Canaveral's qualitative export relations



Port Canaveral's qualitative import relations

Cargo - "Port of Opportunities"

2009
Total Jobs: 2,389
Total Income: $178.4 Million
Business Revenue: $126.2 Million
State and Local Taxes: $13.2 Million
Short tones per year: 2,395,779 short tons
Cargo: Petroleum, Cement, Newsprint, Salt, Slate, Granite, Rock, Aggregate, Lumber, Slag, Limestone

$392.2 Million annual Income

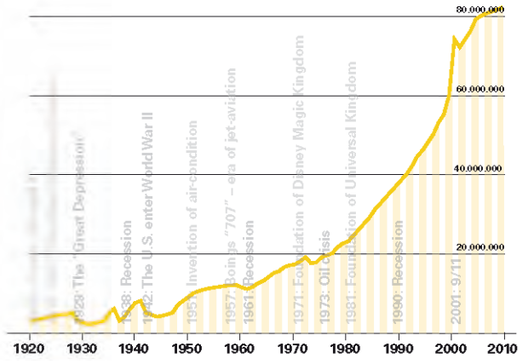
Cruising Tours towards or from Port Canaveral

Cruise - "Port of Choices"

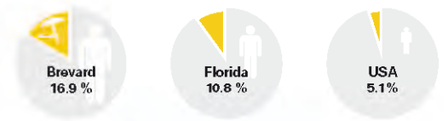
2009
Total Jobs: 2,389
Total Income: $392.2 Million
Business Revenue: $916 Million
State & Local Taxes: $29 Million
Passengers per year: 3,573,960

Space Coast Tourism

In the early days, Florida's Space Coast was controlled and affected by the Air Force and the NASA. They formed not just the landscape but also the National imagination of Florida's eastern coast and created a connotation of physical and outer space. The local tourist economy promotes itself with this brand by covering their products with the label of space exploration. In fact, the space exploration and the Kennedy Space Center Visitor Complex have a rather small impact on the economical wealth of tourism.



Total annual Number of Tourists in Florida (2008: 81 Mio)



Percentage of Employment directly dedicated to Tourism

Tourism Hot Spots at the East Coast

The lodging facilities gather at points of touristic attractions. In the area of Orlando, hotels and other lodges are in the surrounding of theme parks along the infrastructural arterials. Along the Coast, where beach tourism takes place, they are spread along the barrier and concentrate at hot spots like Daytona Beach, Port Canaveral or Cocoa Beach.

Tourism in Florida and Brevard

Beach Tourism at the Coast, Eco Tourism in the Wetlands and Theme Parks around the big cities are the main attractions in Florida. Therefore in the State of Florida 10.8% and in Brevard County 16.9% of employed are directly evolved in Tourism – compared to 5.1% in the US.

Beach Tourism:
The long beaches are used for Spring Break holidays as well as surfing

Cruising
Pre-cruising days and cruising ships with stop over result in day tourists

Historical Centers
Cocoa Village establish itself as a chilled out lagoon town with retail

Space Related
On launch days thousands of spectators arrive, added to KSC visitors

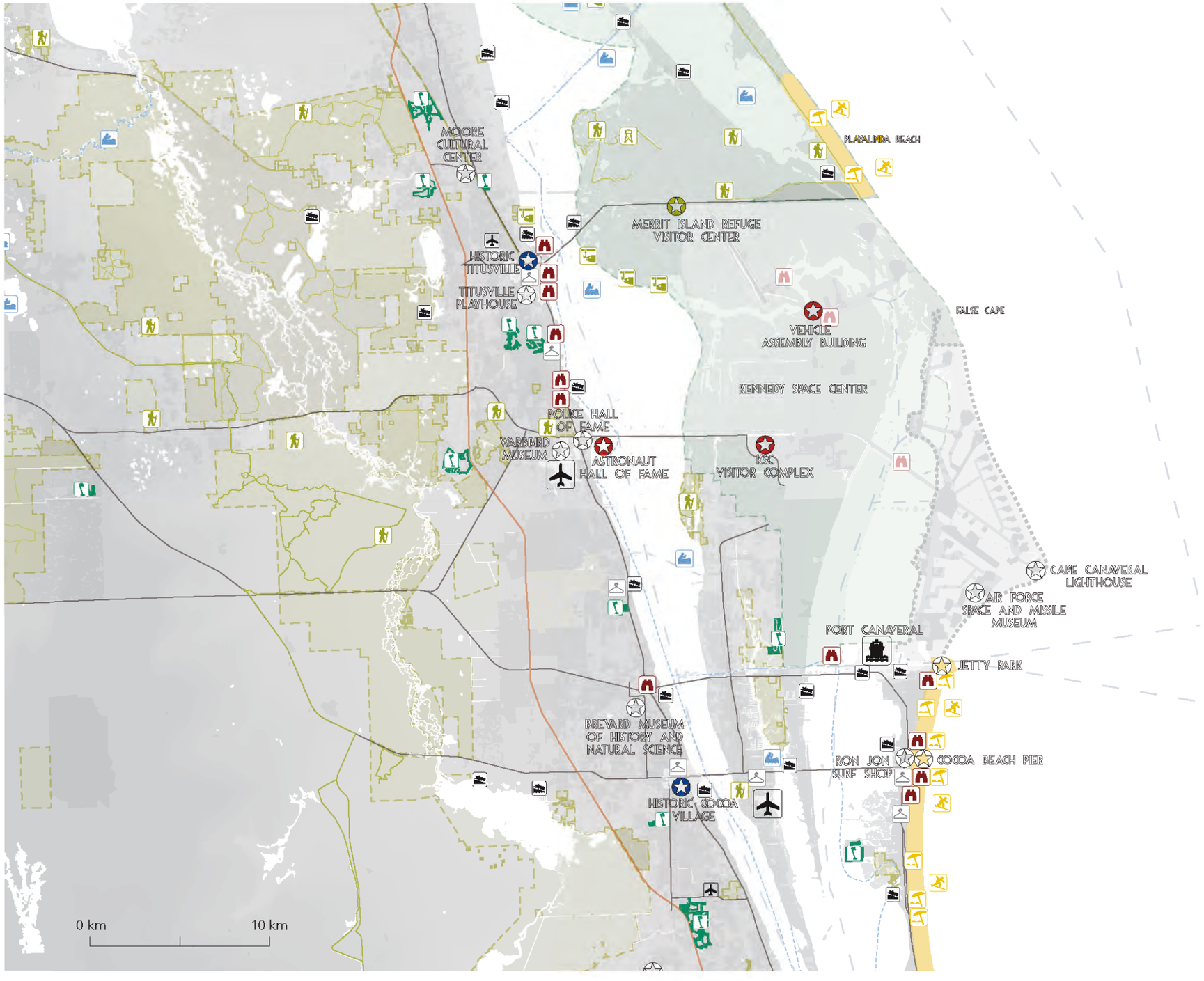
Activity Oriented
Entertainment and activity based recreation likegolf and fishing

Eco Tourism
The presence of huge parks and refuges evoke fast growing eco tourism

Retirement Facilities
Elderly people enjoy the warm climate of the coast like all over florida

Space Coast Tourism Focus

Space Coast Tourism advertises with astronauts on vacations although tourism is independent from NASA and ranges from leisure to activity based tourism. Merritt Island and the mainland is dominated by nature related tourism whereas the coast benefits mainly from its beach tourism.



"Jetty Park", Port Canaveral

"Historic Cocoa Village", Cocoa Village

"The Cocoa Beach Pier", Cocoa Beach

"Sunset Harbour", Indian Harbour Beach

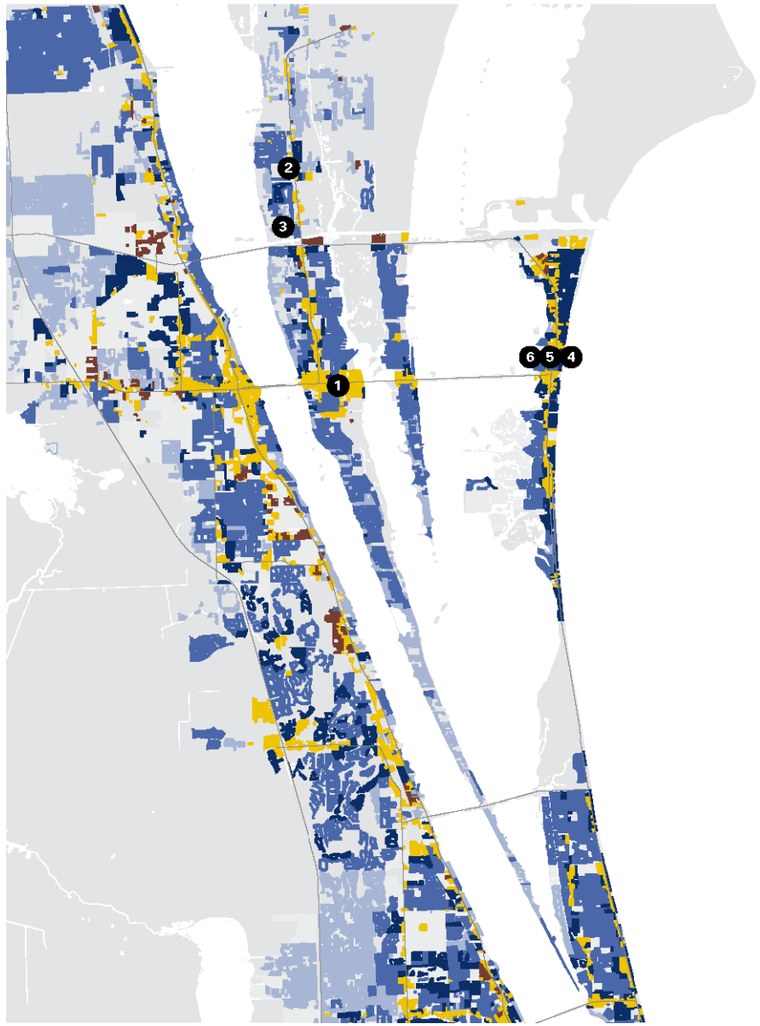
"The Cove", Port Canaveral

"Kennedy Space Center Visitor Complex", Merritt Island

Touristic reality

Each tourism facility advertises their own products in colorful images. On a closer look, the real spots are rather common, despite the label "Space Coast".

"The Best of Cocoa Beach", Promotion Map of Cocoa Beach, 2001



Residental high density
Residential medium desity
Residental low density
Commercial
Industrial

The Generic in Between

The Florida's eastern coast settlement is dominated by topography and touristic use. The condition of the costal barriers is defined by orientation towards two sides: to the open sea and the lagoon and the relative small amount of affordable land due to the narrow barrier. These conditions create a specific type of barrier settlement. Southern Merritt Island is an topographical exception: an peninsula surrounded by the two lagoons. This creates a second typology of barrier settlement.

1

2

3

Merritt Island's Barrier Sprawl

Merritt Island's wider barrier evokes pattern that is similar to the urbanization on the mainland. The lack of economical pressure by beach tourism industry and the capacity of land created a sprawl-like situation. The different uses are dispersed all over and the density changes almost randomly. The distances are long and the different locations are just accessible by car.

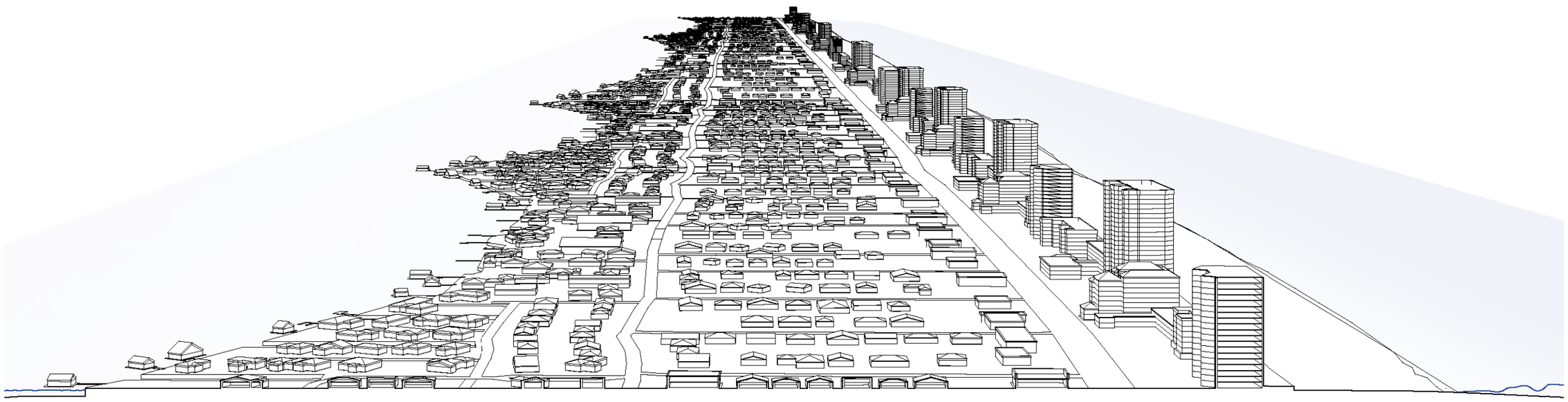
4

5

6

Cocoa Beach's Costal Strip

The settlement on Cocoa Beach's barrier is not a singular phenomenon but a type which can be observed on large parts of the Eastern barrier – the Coastal Strip.



Finger Development

The coastline facing the lagoon is extended and unfolded in fingers to enable residential living on the water edge. The community on each finger is relatively closed due to the dead end street and the orientation of the houses to the artificial lagoon shore.

Residential Houses

The median part of the costal strip consists of conventional one or two story buildings and a medium density.

The Coastal Strip

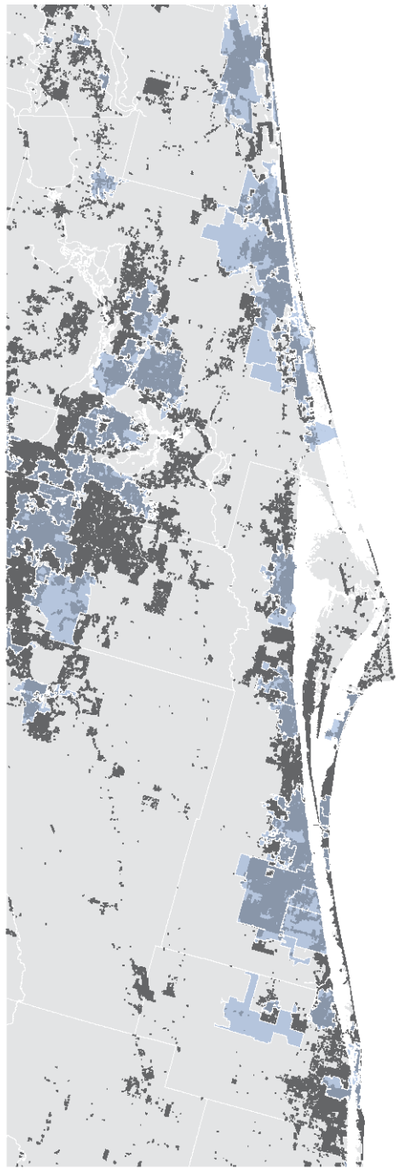
On the western side towards the lagoon the Costal Strip is flanked by supply and retail facilities like restaurants, shops or smaller motels which advertise with large billboards.

Large Condominiums and Beach

Facing the open sea on the other side of the costal strip, large condominium buildings and hotels allow mass tourism during Spring Break Holidays. The coastal strip looses its visual reference towards the sea. This proximity is only perceptible on a virtual level.

Reef Typology: The Coastal Strip

On the reefs Florida's east coast is dominated by a very specific built pattern: The Coastal Strip.



Uncontrolled Built Up

The prohibition of settlement on Cape Canaveral and on Merritt Island not just effect the islands itself but has also an impact on the opposite shore. On Volousia and Brevard county border there is a gap in the built pattern.

Knots of Intersections

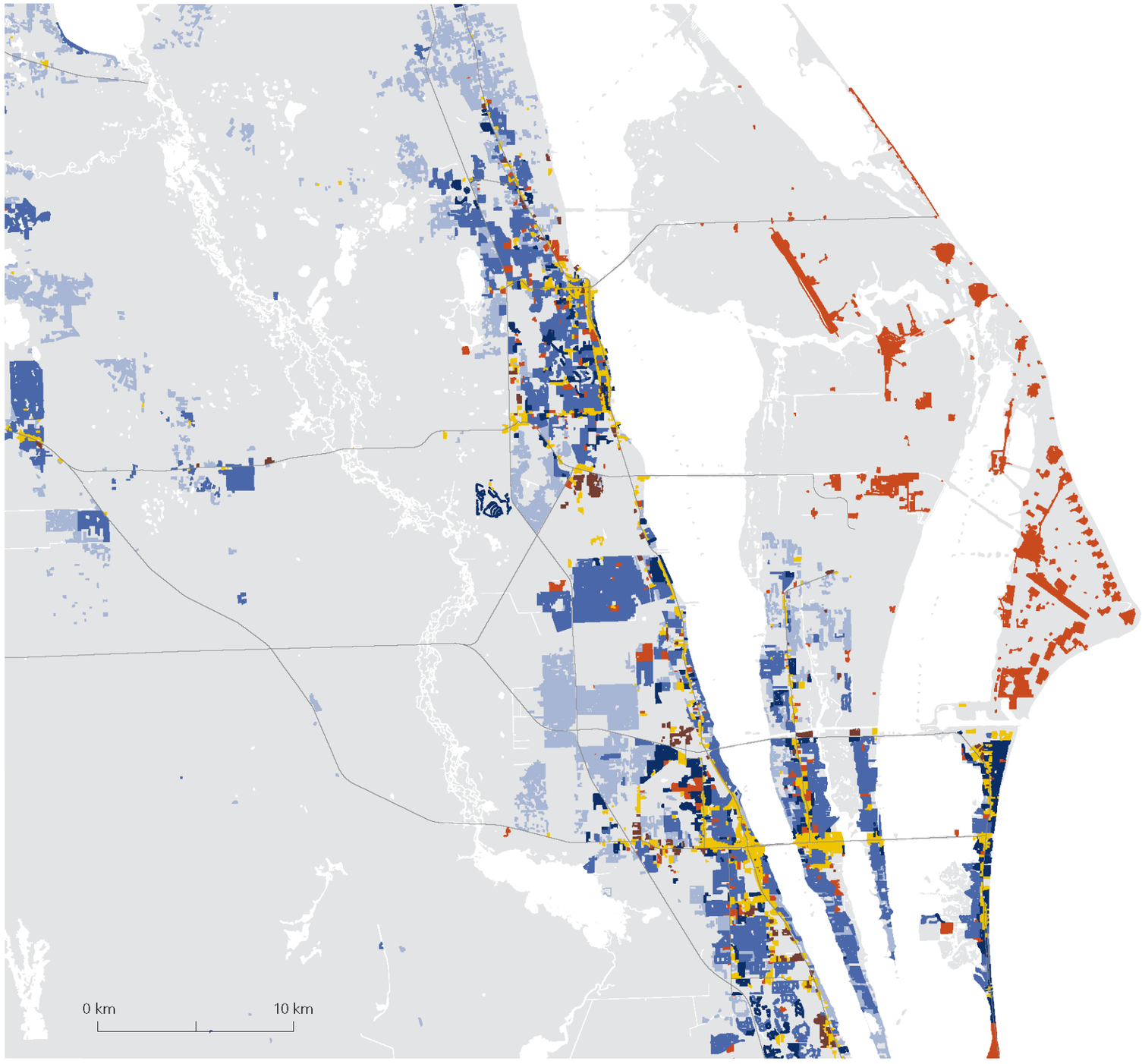
The pattern of Average Annual Daily Traffic count shows two different mechanics: a radial pattern around Orlando and a linear development along the coast with the arterial on the mainland and a second road on the barrier. At intersections of traffic infrastructure, the pattern of street denses and creates knots on mainland's shore.

Distribution of Functions

The typology of distribution of uses resembles on the barrier the mainland's built structure. The costal strip follows the barrier northward and stops immediately at Port Canaveral's military border. Further north it starts over again. Retail and business facilities mainly follow the ways of transportation – intensified in the typology of the Coastal Strip

Reality

The steady heterogenity of the Interstate 4 corridor is opposed by the Coast line, where specific patterns are squeezed into a dense setting of geological dependencies and pressures from authorities like the NASA or the preservation Areas.



- Residental high density
- Residential medium desity
- Residental low density
- Commercial
- Industrial
- Institutional

Built Pattern

The distribution of functions on Florida's Space Coast differs within its areas: From mainland to Merrit Island to the barrier reef to Cape Canaveral and Kennedy Space Center. The federal areas are monofunctional used for infrastructural facilities. On the shore, the uses are stringed along the costal strip. Merritt Island's patterns is diverse in use and density.

The lagoon shores are dominated by Finger Settlements. The mainland is characterized by the commercial uses gathered at large roads from North to South and around infrastructural knots. The building structure on mainland's lagoon bank is neither continous nor specific.

The exhausted local catalyst?

The NASA as an economical motor is not any more essential for the region. As a catalyst, the federal agencie it formed the infrastructural as the social structures in the region and created by the way a platform for new developements in the last fourty years. Tourism, notably the cruises at Port Canaveral or the beach tourism in Cocoa Beach are as independent as the high tech sector is. Kennedy Space Center Visitor Center with Launch Pad 39 A and B, the exhibition of rockets, the gigantic Vehicle Assemblage Building and the other objects of mankind's history are not any more the vertex of global attention.

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