Port of Amsterdam has high hopes for Betuwe Line

At the conference entitled “Amsterdam and the Betuwe Line”, held in July, President and CEO of the Port of Amsterdam, Hans Gerson, expressed his optimism about this line. The newly inaugurated Betuwe Line is a dedicated rail line for goods transport and runs between the Port of Rotterdam and the German border. Gerson indicated that, thanks to the new rail linkup between Amsterdam and the Betuwe Line, the Port of Amsterdam will have better connections with the European hinterland. Cargo from Amsterdam uses the rail line to Utrecht, then the rail line to Geldermalsen and finally the new linkup with the Betuwe Line. Gerson expects to see a further growth of rail cargo, which will ease the pressure on the road network.

Rail transport is becoming evermore important to the Port of Amsterdam. At present, four percent of goods moved through intermodal transport are shipped by rail. Over time, the contribution made by rail transport will become increasingly larger, going from 4.7 million metric tons in 2006 to 7.5 million tons in 2010 and 11 million tons in 2020. To accommodate this growth, a number of rail projects are taking shape in the port area. Westpoort (port section) will have a second rail connection by the end of 2008, while Azijhavenweg (road) will then be home to a new railroad yard. The existing railroad yard on the Westhavenweg (road) will undergo an expansion in early 2009. And the Transformerweg (road) will get a rail connection by the end of 2010.

The future for the Betuwe Line is looking good. Many transport companies are taking a keen interest in the new rail connection. The Betuwe Line is expected to be used by some seventy cargo trains per week in the next future, a figure that will probably rise sharply in the coming years.

The Port of Amsterdam has a fifteen percent stake in Keyrail (the Betuwe Line operator). Prorail (responsible for the Dutch rail infrastructure) owns fifty percent of its shares, while the Port of Rotterdam holds the remaining thirty-five percent.

The Commission

As from now, a new numbering will be used for PIANC’s WG-reports. The Commission names will be left out and all reports will carry the name “PIANC WG + number”, in order to simplify the system that was used before. As already 95 reports have been published before, the EnviCom report that you will receive together with one of the next issues of “On Course” will be called PIANC WG 96. As a lot of Working Groups are still ongoing, new TOR will start with the number 126.
du Havre pour l’entretien des bassins du port.

Propriété du GIE « Dragages Ports » (Groupement réunissant les ports autonomes et l’Etat et assurant la mise en commun des moyens de dragage), la « Gambe d’Amfard » est une drague de 60 mètres de long qui a la particularité d’être mixte, c’est-à-dire à la fois drague à benne et drague aspiratrice en marche. La nouvelle drague est équipée d’une grue et d’un crapaud d’une capacité de 9 m³: ces équipements permettent de travailler jusqu’à 35 mètres de profondeur, y compris dans des zones difficiles d’accès, et d’extraire des bassins, outre les sédiments, toutes sortes de roches et pièces lourdes. Par ailleurs, la « Gambe d’Amfard » dispose également d’une élindière, tube aspirant latéral, permettant d’extraire les sédiments jusqu’à 22 mètres de profondeur et, si nécessaire, de les rejeter, non en mer, mais à terre dans des chambres de dépôt spécialement aménagées pour cela. La capacité en puits de la « Gambe d’Amfard » est de 700 m³ et moins de deux heures suffisent pour remplir son puits avant d’aller décharger au dépôt d’Octeville.

Le port du Havre utilise une flotte de quatre dragues pour assurer l’entretien de ses accès et bassins: une drague mixte - La « Gambe d’Amfard » - et trois dragues aspiratrices en marche -La Hève», la «Daniel Laval», gérée par le Port Autonome de Rouen (PAR), et la «Samuel de Champlain» gérée par le Port Autonome de Nantes Saint Nazaire (PANSN). Ces dragues sont périodiquement appelées à intervenir dans les chenaux du port du Havre, pour extraire annuellement 3 Mm³ de matériaux nécessaires à l’exploitation du port dans des conditions optimum.

Nouveau bateau en énergie solaire

Depuis quelques mois, navigue sur le Canal du Midi un bateau propulsé uniquement à l’énergie solaire. Disposant de quatre moteurs électriques totalisant 40kW, ce bateau de 60 tonnes, long de 30 m et large de 5 m, n’utilise à 5 km/h que 5 kW, ce qui permet de constater la jauge d’énergie à la sortie des batteries. 5 km/h est la vitesse maximum autorisée sur le Canal du Midi pour ne pas endommager les berges de ce canal tricentenaire.

Ce bateau-hôtel est par ailleurs conçu pour l’accueil des handicapés, son pont parfaitement plat se situant au niveau des berges du Canal. Construit en Belgique, il a traversé cet hiver 2006-2007 la France jusqu’à Carcassonne, franchissant 1200 km et plus de 200 écluses, sans bruit, sans fumées, sans CO₂ émis.

Il détient à notre connaissance, avec 80 m², le record du monde de surface de panneau solaire installé sur un mobile. Son exploitation donnera des indications précieuses sur la viabilité d’une utilisation basée uniquement sur l’énergie solaire. Le concept a vocation a être dupliqué sous tous les climats fortement ensoleillés, pour un éco-tourisme responsable. Sous d’autres climats, une légère recharge sur le réseau électrique la nuit suffira amplement à compléter l’énergie nécessaire pour une journée de navigation.

Le procédé est extrapolable à des barges autopropulsées de type Freycinet (spits), celles utilisées dans le passé sur les canaux de l’Est n’avaient en effet que des moteurs thermiques de 45 kW et n’en utilisaient pas plus de 20 kW (source: Groupe Central de confrontation..., décembre 1964). A quand des écoutilles solaires, fournissant jusqu’aux deux tiers de l’énergie nécessaire en canal ou jusqu’au quart à de grands bateaux sur des fleuves canalisés?

Jean Marc Deplaix
AIPCN France

Lack of liner services on the Danube

The situation on the Danube with respect to container transport is not very bright. The development of the past few years contrasts starkly to the success stories in Western Europe (Rhine, Seine, Rhone, Belgium waterways); specifically, it has plunged. In
2005, the volume transported on the Austrian Danube was merely 3,000 units, which is around 5,000 TEU. This corresponds to around one percent of Austria’s imports and exports via seaports. Currently, only exports of cut timber in the direction of Antwerp as well as empty containers from Hungary and Germany to Austria are shipped via the Danube.

There are many reasons for the decline in container shipments on the Danube. The massive impediments by several crises in former Yugoslavia must be mentioned, and the nautical and economic difficulties for inland navigation in the western direction (long transport times to ARA-ports passing through more than 60 locks as well as very competitive shuttle train connections). In contrast to the Rhine, the development of container inland navigation was not bolstered by seaports, i.e., the transport of overseas containers in the hinterland as the basis for scheduled services was lacking.

Findings of the COLD-study

In the light of the double digit growth rates in the global transport of goods and the chronic capacity bottlenecks at Europe’s major ports and connecting routes in their hinterland, now would be the right time for establishing container transport along the Danube with Constanta as gateway. The COLD-study carried out by via Donau and Constanta Port Administration confirms this assessment: the cost benefits of using inland vessels specialised in container transport are significant. A look at the entire supply chain for Europe-Asia shipments shows that the frequently mentioned setback of long transport times is not an obstacle. Moreover, as the environmental impact balance is good, a win-win situation is possible for all actors.

As the target group and initiator of increased use of inland navigation, the ocean carriers like Maersk Line, MSC, Hapag Lloyd or ZIM play a very important role. Ultimately, the wait-and-see attitude taken by these companies must be overcome in order to implement a container line. Usually, customers want to wait until the services go into operation and observe the quality for some time – only then contracts for volumes will be signed. A financially robust and balanced structure of the shareholders of the operating consortium is necessary. The main partner is to be an ocean carrier, as already mentioned.

The COLD-study focuses on the flow of maritime containers as a basic volume for a regular container line on the Danube. Having established such a line, the costs of inland navigation can be improved by combining maritime volumes with continental cargo (45’-containers as well as silo and tank containers) and ro/ro shipments.

Mag. Gerhard Gussmagg
Team Manager Transport Development
Young Professional PIANC

HUngary

CoCom workshop of the Austrian Section at the EIWN 2007 in Visegrád

The fifth International Conference on European Waterway Navigation 2007 (EIWN) was held from 27 until 29 June 2007 in Visegrád, Hungary. At this conference, PIANC’s Austrian Section organized a CoCom workshop. Despite the fact that there was no official representative of the PIANC General Secretariat, the meeting did run very well, as the conference organizer allowed to run the workshop as an official part of the EIWN conference.

Mag. Gerhard Gussmagg
Team Manager Transport Development
Young Professional PIANC

Black Sea see: shipbuilding boom

The Black Sea is seeing a shipbuilding boom. More than ninety percent of world trade is conducted through maritime transportation, making shipbuilding one of the fastest growing industries in the recent boom in global trade, which has grown on average by more than five percent annually. As a natural consequence of Turkey being a peninsula located at a strategically central position close to many wealthy European markets, Turkey’s growth in shipping construction has outdone all of its global rivals in the last four years, growing three hundred sixty percent.
The Black Sea region has been the main beneficiary from this unprecedented upswing. Maritime Undersecretary Hasan Naiboğlu said workshops to manufacture small vessels and fishing boats in the Black Sea district of Eregli are being modernized to create at least half of the capacity of the shipyards in Tuzla, Istanbul. Boat yards are opening one after another in the Black Sea region, he noted. According to figures provided by the undersecretary, Turkey is the world’s eighth-biggest ship manufacturer, with 1.8 million deadweight tons (DWT) worth of orders last year. It was twenty-third in 2002. Turkish shipyards completed 135,000 DWT of orders in 2002, rising to 600,000 in 2006. The sector has invested USD 500 million in the last three years to expand facilities and improve them technologically. The number of shipyards active in the country was thirty-seven just five years ago. Thanks to efforts to meet an ever-increasing demand, the number has jumped to fifty-nine. Meanwhile, projects, investment and feasibility studies for sixty-one new shipyards are currently ongoing. Once these new production facilities are completed, the country will have hundred twenty shipyards with a capacity of constructing 9.2 million DWT of vessels per year. Additionally the biggest ship that a Tuzla shipyard was able to construct was a 20,000-DWT vessel, but now it is possible to build vessels six times as large, and new investments are underway to enable the building of 180,000 DWT ships.

**MALAYSIA**

**Tanjung Bin power station - submarine water pipeline**

In 2007, Murray & Roberts Marine were contracted by a local Malaysian Contractor, Kencana Infrastructure, to carry out the installation of a nominally 500 mm diameter pipeline across the Sungai Pulai Estuary. The 850 m submarine pipeline forms part of the greater project to pipe water to the Tanjung Bin Power Station in Malaysia.

**CANADA**

**Canada Shipping Act, 2001 enters force**

Lawrence Cannon, Minister of Transport, Infrastructure and Communities has announced that the Canada Shipping Act, 2001 (CSA 2001) has entered into force in July 2007. It replaces the Canada Shipping Act (CSA) as the principal legislation governing safety in marine transportation and recreational boating, as well as protection of the marine environment. It only now comes into effect, as time was needed to review existing regulations, develop new regulations, and consult with a wide range of marine stakeholders. According to Mr. Cannon, this is a significant milestone in Canada’s maritime history. After all, after more than one hundred years, new legislation has been enacted, which values, first and foremost, the principles of safety and protection of our marine environment.

The new Act promotes the sustainable growth of the shipping industry without compromising safety. It represents an updated and streamlined version of the original CSA, making it clearer and easier to understand:

- it promotes safety and provides better protection for the marine environment through new and enhanced regulations;
- it shifts from an inspection-based regime to a compliance-based regime, where vessel operators are encouraged to take a more active approach to safety;
- it introduces a new method of enforcement with the introduction of administrative monetary penalties;
- it replaces the Board of Steamship Inspection with the new Marine Technical Review Board; and
- it establishes a new set of voyage classifications for the safer operation of vessels.

The CSA 2001 will help the marine community operate in a manner that is safer, more efficient, environmentally sound, and responsive to the needs of Canadians in a global economy. It applies to Canadian vessels operating in all waters and to foreign vessels operating in Canadian waters, ranging from canoes and kayaks to cruise ships and tankers. For more information about environmental protection or environmental response systems, please visit Transport Canada’s Marine Safety Operations and Environmental Programs website at www.tc.gc.ca/marinesafety/oep. If you would like more information about the Canada Shipping Act, 2001 reform, please visit the Canadian Marine Advisory Council website at www.cmac-ccmc.gc.ca.

300 t capacity linear winch at Tanjung Bin
**NEWS FROM THE NAVIGATION COMMUNITY**

**Peru**

**LNG Export terminal**

The joint venture CDB Melchorita (Saipem/Odebrecht Construction/Jan de Nul) have started construction activities of the LNG Export Terminal. The facilities are located in Pampa Melchorita, Peru, including a 1350 m long trestle, a LNG Berth for 160,000 m³ tankers, breakwater and dredged access channel. The detailed design and the construction methods are being performed by EXE Engenharia Brazil.

Leandro Sabino  
Brazil

**DJIBOUTI**

**Doraleh container and bulk liquid terminal**

Construction activities of the Doraleh Container Terminal are going on schedule by the joint venture Odebrecht Engenharia e Construção, Brazil & Soprim Construction, Djibouti.

At the moment the first piles of the 1050 m long wharf are being driven and the rock embankment in the perimeter of the container yard is almost completed as shown in the picture on the opposite page (below).

Leandro Sabino  
Brazil

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The pipeline comprised two previously assembled pipeline strings, intended for installation in a horizontally directionally drilled (HDD) hole, of 300 and 600 m respectively. Due to technical difficulties, the option of HDD was abandoned by others and the pipeline was installed using the conventional bottom tow method by Murray & Roberts Marine from South Africa.

As the pipeline was intended for installation in an HDD hole it did not have a concrete weight coat and was positively buoyant. To prevent floatation during installation, concrete half shells were attached to the pipeline to form a continuous concrete weight coat. The concrete weight coat also provided protection to the external HDPE coating.

The pipeline was pulled in a single operation in a pre-dredged trench using the bottom tow method. A 300 t capacity linear winch was used for the pulling of the pipeline.

Alec Dixon  
Senior Project Engineer Murray & Roberts Marine

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**Pipeline with concrete weight coat onshore near Tanjung Bin**

**Test pile driving on LNG terminal site**
BRAZIL

Brazil: cabotage to be introduced

Fernando Fialho, director-president of the National Brazilian Waterway Transport Agency (Antaq), has said that, although the Special Office for Ports, created by the federal government, has given greater attention to the Port of Santos, it needs to look at the whole port complex in the country. According to Mr. Fialho, all the ports will need to develop the practice of cabotage.

Cabotage, i.e. the utilization of ocean-going barges for near-coast inland destinations and the execution of national transportation by foreign companies, is a practice that is applied extensively in the main ports of Europe, especially
Hamburg, Antwerp and Rotterdam. In Brazil however, most cargo transport is concentrated on the highways, even though they are full of potholes. Mr. Fialho also defends the idea that smaller ports could function as a complement to the principal terminals in the country. He cites the cases of São Sebastião and Santos, in the state of São Paulo, and Recife-Suape, in Pernambuco.

Mr. Fialho considers the National Logistics Plan (PLN), subject of a lot of discussion within the Ministry of Transport, but which has not yet been put into practice, as fundamental. According to him, the PLN is one of the great tools for going in the right direction. The director of Antaq emphasizes that lack of strategic planning is one of the reasons for the existence of the countless logistical obstacles in the country.

**PANAMA CANAL**

Panama Canal celebrates 93rd anniversary

Ninety-three years after its grand opening in 1914, the Panama Canal has commemorated its anniversary by celebrating the successful start of its historic expansion program. Nearly a year after the Panamanians approved a national referendum to expand the waterway, the Panama Canal Authority (ACP) has set the project in motion. It awarded the first expansion-related construction contract, the first of five dry excavation projects that will create a new Pacitic Locks access channel. This new channel will link a new, third set of locks on the Pacific end of the Canal with the existing Gaillard Cut (the narrowest stretch in the Panama Canal).

Recently, the ACP assembled an experienced internal team to manage this historic undertaking, hired legal and financial advisors, and released other preliminary tenders. It has also presented the Canal’s Expansion Program to international financial institutions, as it begins to weigh financing alternatives for the project. Expansion will build a new lane of traffic along the Panama Canal through the construction of a new set of locks, doubling capacity and allowing more traffic and longer, wider ships. This project, which just received the 2008 Samoter award for “Best Construction Project in the World,” will be the largest undertaking at the Canal since its opening. There were 14,194 total transits in fiscal year 2006. Since 15 August 1914, more than 922,000 vessels have transited the waterway.

**JAPAN**

Japan provides grants to the Philippines for maritime safety

The Japanese Foreign Minister Taro Aso and the Philippine Foreign Secretary Alberto Romulo have signed agreements on two Japanese grant-aid projects. The grant, worth USD 12.5 million in total, will help the Philippines in disaster prevention and management, as well as maritime safety and security. According to the agreements, Japan will extend USD 7.2 million for the improvement of flood forecasting and warning system in the Pampanga and Agno River Basins in the Philippines. The grant is expected to substantially improve information accuracy and provide technical support for improving the system operation for flood forecasting and disaster prevention.

The second project, Enhancement of Communications System for Maritime Safety and Security, USD 5.3 million will help supply and install communications equipment at Philippine Guard (PCG) sites to improve and enhance the PCG’s capacity for search and rescue as well as counter-terrorism.

**EUROPEAN UNION**

EU still struggles to define maritime policy

Ministers have adopted a common position on a proposed Marine Strategy Directive, opposing the Parliament on a number of important points. Meanwhile, the Commission is faced with fragmented governance structures and poor coastal surveillance, which hamper its efforts to formulate a common EU maritime policy.

On 23 July 2007, the Council adopted a common position on the Marine Strategy Directive, bearing in mind that the proposal is for a Framework Directive that should not burden implementation with too much technical detail. At issue is the question of determining “good environmental status”. In its first reading in November 2006, Parliament had proposed a detailed annex with conditions for assessment. The Council rejects this notion and calls instead for “generic qualitative descriptors”.

Parliament and Council are also opposed on the issue of implementation deadlines – Parliament wants a tighter timetable – and on the legal obligations resulting from a new Directive. The Council considers that it would be unrealistic, no matter how desirable, to make achievement of good environmental status, even by 2021, a legally binding objective. By October 2007, the Commission is to present an action plan for a common EU maritime policy. Furthermore, by December 2007, the European Council and Commission hope for a political agreement on the maritime policy.
NEWS FROM THE NAVIGATION COMMUNITY

ON THE CALENDAR

CEDA Dredging Days: poster competition for students and young professionals

The theme of the coming CEDA Dredging Days, to be held from 7 until 9 November 2007 in Rotterdam, the Netherlands will be “The Day after we stop dredging – Dredging for infrastructure and public welfare”. On this theme, CEDA will organize a poster competition for students and young professionals. Participants in the competition will have to create a poster and make a clear and bold statement to show what the world would look like without dredging. Submissions must reach the CEDA Secretariat no later than 15 October 2007.

The winner will receive a prize of € 1,000 with € 500 and € 250 for those in second and third place. All posters submitted will be displayed at the conference and a PowerPoint summary of the winning poster will be presented by the judges’ chairman during the conference. The first three posters will also be published in DPC, and will be displayed on the CEDA and the Dredging Days websites.

Details about entering and the rules of participation are available at the Dredging Days website at www.dredgingdays.org.

Anna Csiti
CEDA

First European Inland Waterways and Ports Forum

The first European Inland Waterways and Ports Forum will take place on 27 and 28 November 2007 at the Crowne Plaza Hotel, Amsterdam, The Netherlands. PIANC, together with the Platform of European Sea and Inland Ports - a Partnership of ESPO and EFIP, and Inland Navigation Europe (INE), will add their support to this event.

Focusing on the development of inland port and waterways in the face of explosive growth of trade volumes in Europe’s seaports, the forum is of special interest to shipping lines, shippers, forwarders and intermodal operators.

Forum sessions will cover:

- European overview, including present EU projects;
- Ports and inland waterways;
- Using inland waterways today;
- Environment and economics.

Organizations that have already confirmed presentations include the European Commission, European Investment Bank, CEDA, Hamburg Port Authority, European Sea Ports Organization, Black Sea Coastal Association, Via Donau, TEN-T, European Federation of Inland Ports, the Port of Le Havre Inland, Duisburger Hafen and Inland Navigation Europe.

For more information and to register, please contact events@lrfairplay.com or Nigel Dickson or Julie Madigan on +44 1737 379105.

Second European Conference & Exhibition on Inland Terminals

The 2nd European Conference and Exhibition on Inland Terminals will be held in Antwerp, Belgium on 13 and 14 November 2007. The following topics will be on the conference programme:

- Supply chain developments: regional distribution centres support customer fulfilment & last mile logistics.
- Developments outside Europe: international examples are important to further the efficiency of the inland transport network in Europe.
- Inland terminals in Europe: growing importance of inland ports/terminals as consolidation hubs for continental freight.
- The intermodal network in Europe: inland ports are extending their service offering to include also rail transport; rail & inland waterways are gradually creating synergism.
- Innovative inland logistics: innovation is key to enhance the competitive position of freight intermodalism throughout Europe.

If you wish to find out more about this conference, please visit www.inlandterminals.com.

Euromarina/FFPP Conference in November 2007

The French Federation of Yachting Harbours will organize its annual Euromarina/FFPP conference on 9 November 2007 at the Senate, Palais du Luxembourg, in Paris. Organized on a round table basis, the purpose of the conference is to allow speakers to foster debate on specific subjects with the intention of aiding promotion of marine leisure. As last year, Euromarina is co-operating with the FFPP to discuss the subject of yacht harbours in Europe.

Several speakers will present different aspects of the European Marina Industry at the conference, which will be in turn attended by representatives of the EU Commission and Parliament. This year, ‘ACT II of the Yacht Harbours – Marinas in Europe’ will focus on the economic benefit that Yacht Harbours and Marinas have on the territory in which they are based and the role played by regional policies in facilitating the growth of a sustainable marina industry and assisting in the development of economic and social policies.
André Graillot started his career as founding Director of the Port of Owendo in Gabon and then joined the “Service Technique Central des Ports et des Voies Navigables” of the French Ministry of Transport. He developed a course on maritime works that trained generations of French port engineers. Later, he was Director of Prospects and General Research within the port of Le Havre Authority from 1977 until 1980; after that, he was appointed Equipment Director from 1980 until 1984. He was then promoted Deputy Director of French Maritime Ports and Navigation until 1987, when he joined the Port of Nantes-Saint-Nazaire Authority as Executive Manager until 1994. Later, he came back to the Port of Le Havre Authority as the Executive Director until 28 February 2000.

Throughout his years in Le Havre, André Graillot contributed with great determination and a thorough understanding of business to the development of trades, and to the drawing-up of new logistics projects, particularly Port 2000; so many records which without a doubt will mark the future of the French ports. In the High Public Works Council, from 2000 to 2005, he was commissioned as the Minister’s delegate in the board of ports, among them Marseilles, and provided great expertise in the government’s elaboration of shelter port policy. After he retired as a civil servant, he became vice-president of Spanish company PROGOSA, as an adviser for upgrading of African Ports.

André Graillot will leave behind the permanent image of a person very much attached to the Port World and all its personnel. His intelligence, personal involvement in studies, kindness and nobleness of heart, and the solidity of his convictions will remain printed in every memory. He achieved a lot to promote consensus among port communities toward necessary evolutions. PIANC France feels a great loss with the passing of André Graillot, a great port engineer, a member of PIANC France, and a member of the international community of port engineers.
the French Maritime Academy and expresses deepest condolences and sympathy to his family and to whoever knew and enjoyed him.

Claude Gressier  
French Government Chief Delegate  
Geoffroy Caude  
Senior PIANC International vice-President, MarCom Chairperson

**ALSO IN THE NEWS**

“Warm seas” cause more hurricanes

A new analysis of Atlantic hurricanes, published in Philosophical Transactions of the Royal Society in London, says that the number of hurricanes has doubled over the past century. The study shows that warmer sea surface temperatures and changes in wind patterns caused by climate change are fuelling much of the increase. The authors of the analysis say it is not just due to nature, but that other factors, such as the greenhouse effect, also play a role.

Hurricanes are a spinning vortex of winds that swirl around an eye of low pressure. Thunderclouds surround the edges of these storms and they can wreak devastation on people and property when they hit land. We only need to be reminded of Hurricane Katrina in New Orleans in 2005 to know what that is like. Scientific analyses in recent years suggest hurricane numbers have increased since the mid-1980s. This new study, looks at the frequency of these storms from 1900 to the present and it says about twice as many form each year now compared to hundred years ago. The authors say that man-made climate change, which has increased the temperature of the sea surface, is the major factor behind the increase in numbers.

According to Dr. Greg Holland, from the United States National Centre for Atmospheric Research in Colorado, who authored the report, over the period we have had natural variability in the frequency of storms, which has contributed less than fifty percent of the actual increase in our view. Moreover, approximately sixty percent, and possibly even seventy percent, of what we are seeing in the last decade can be attributed directly to greenhouse warming. Experts say that 2007 will be a very active season with nine hurricanes forecast, of which five are expected to be intense.