



**Royal  
HaskoningDHV**  
*Enhancing Society Together*



# Climate change adaptation for maritime and inland ports, waterways and navigation infrastructure

*PIANC WG 178*

Ben Hodgkin  
27 November 2015



# Agenda

- Overview
- Key objectives and scope of guidance
- Outline for work to date:
  - Understanding the climate science
  - Understanding and assessing the risks
  - Workshops and case studies



# Overview

- The mission:
  - Raise awareness; build capacity
  - Highlight importance of preparedness
  - Focus on data collection and management
  - Avoid 'paralysis due to uncertainty'
  - Bring climate change adaptation into mainstream business planning



# Group membership

- Call for nominations in Autumn 2014
- 36 active members – maritime, inland and recreational expertise
- EnviCom mentor – Jan Brooke (Jan Brooke Consulting)
- Chair – Charles Haine (Royal HaskoningDHV)
- 10 partner organisations including:



# Group membership





# Key objectives

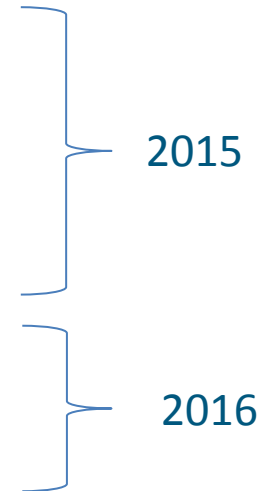
- To develop an approach to climate change adaptation planning and delivery for maritime and inland port and navigation infrastructure;
- To refer to the PIANC TG3 report on climate impacts
- To generate a toolbox of adaptation options
- To evaluate the effectiveness of different adaptation options in typical or generic climate change scenarios;
- To understand and provide guidance on addressing challenges and identifying priorities;
- To provide a guidance framework for decision making.

# Scope of guidance document

- Provide an appropriate level of background information
- Help the reader understand and explore the widest possible range of options
- Ensure the reader appreciates the importance of preparedness.
- Discuss some of the challenges which could be faced, including scepticism about climate change
- Describe a decision making framework
- Support all of the above through the collation and presentation of case studies
- Highlight technical gaps that would benefit from the preparation of additional PIANC guidance

# Provisional report structure

1. Orientation and Context
2. Climate Change Science
3. Identify and Assess Risks
4. Raise Awareness and Build Capacity
5. Collect and Manage data
6. Selection of Adaptation Options
7. Adaptation Plan
8. Plan Implementation




- Appendix A – Glossary
- Appendix B – Outcomes from Regional Workshops
- Appendix C – Seaports and Marine Infrastructure Tool Box
- Appendix D – Inland Navigation
- Appendix E – Useful Resources



# Section 2 – Understanding Climate Science

- **Key chapter objectives:**
  - Overview of key climatic parameter – reference to TG3
  - Outline key impacts expected from change in climatic parameters
  - Introduce techniques for moving from global to regional / local data
  - Introduce tiered approach to the assessment of risk
- **Not a technical / scientific paper!**

# Section 2 – the basis




**PIANC**

**EnviCom - Task Group 3**  
Climate Change and Navigation



Waterborne transport, ports and waterways  
A review of climate change drivers  
impacts, responses and mitigation

*"Navigation, Ports, Waterways"*  
*"Navigation, Ports, Voies Navigables"*




INTERGOVERNMENTAL PANEL ON climate change

**CLIMATE CHANGE 2013**  
*The Physical Science Basis*

WG I

WORKING GROUP I CONTRIBUTION TO THE  
FIFTH ASSESSMENT REPORT OF THE  
INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE



## Key Climatic Parameters

Changes in precipitation

Storms / Waves

Fluvial flows

Sea level rise

Ice

Bathymetric or bed level change

Shoreline evolution,

Large scale ocean circulation

Wind

Fog

Water levels

Tidal currents

Air temperature

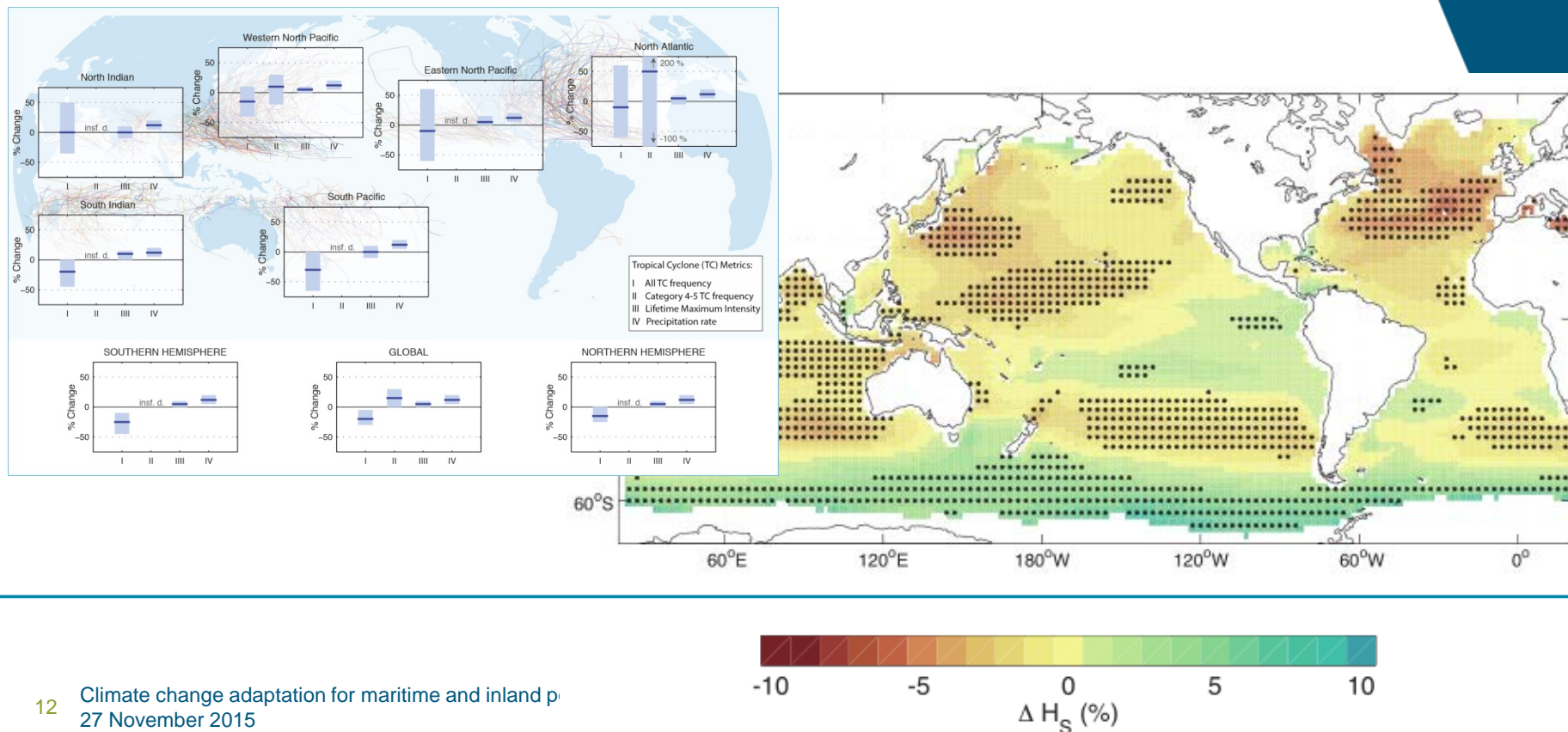
Biological or chemical changes

Wind driven currents

Groundwater

# Section 2 – Climatic Variables

- Description of parameter – summary of global trends (direction and rate of change) and impacts
- Discussion on regional variations and highlight uncertainties





## Section 2 – Climatic Variables

- Translation from:
  - Global – AR5 / TG3
  - Regional – regional wave models / studies
  - Local – if appropriate recommendations for specific localised modelling
- Introduction of tiered conservatism approach.
- Recommendation for ‘do minimum’ – based on current observations and trends.



# Section 3 – Identify and assess risks

- **Assets and Risks**
  - Overview of impacts
  - Define subsystems
  - Why adapt?
- **Risk Assessment**
  - Definitions
  - Risk assessment process
  - Risk Assessment Matrix
- **Vulnerability/Resilience**
  - Quantify Vulnerabilities



# Section 4 – Raise Awareness & Build Capacity

- Scope definition
- Assess resource needs
- Capacity building:
- Preparedness
- Case Studies





# Section 5 – Collect and Manage Data

- Data Set
- Gap analysis
- Data capture methodology
- Simulation – validation and calibration methods
- Data management



# Case studies and Workshops

- A key output of the guidance document – collecting best practice.
- Workshops planned in:
  - London
  - Italy
  - Philippines
  - South Africa
- Workshops to ensure wide range of experience and best practice is captured.



# Case studies and Workshops

- Case studies of climate change adaptation are currently being collected to inform toolbox of adaptation options.
- The key questions relate to :
  - information about the initiative, its location and its objectives
  - details of which climatic factors / parameters were considered, and
  - overview of the main findings and/or recommendations, including any lessons learned.

[https://www.surveymonkey.com/r/navigating\\_climate\\_change](https://www.surveymonkey.com/r/navigating_climate_change)

# Summary

- Key Aim – to provide comprehensive but easy to use guidelines for infrastructure owners and operators.
- On track but lots to do.
- Target publication Q1 2017.
- It is great to get involved with Working Groups!



**Thank you**

**PLEASE COMPLETE OUR CASE STUDY QUESTIONNAIRE!**

[https://www.surveymonkey.com/r/navigating\\_climate\\_change](https://www.surveymonkey.com/r/navigating_climate_change)