

**TASK GROUP**

**World Heritage**

**TG-WH 26**

**31 January – 1 February 2019**

**Bremen**

**Agenda Item:** 6

**Subject:** Development of a Climate Change Vulnerability Index (CVI)

**Document No.:** TG-WH 26/6/1

**Date:** 15 January 2019

**Submitted by:** TG-C, CWSS

For a systematic global assessment of climate change related threats and risks to the OUV of World Heritage properties, a proposal of a Climate Variability Index (CVI) was developed by Jon Day from the ARC Centre for Coral Reef Studies, James Cook University, Townsville, Australia, a former manager at the Great Barrier Reef Marine Park Authority. The CVI has been successfully tested at three individual World Heritage properties within Australia. The need for such a tool has been underlined by World Heritage experts at the WH Committee meeting in Bahrain in 2018. Mr Jon Day has approached CWSS with the offer to comprehensively test the CVI at the Wadden Sea as pilot World Heritage property in Europe.

WSB 27 discussed the suggestion for a CVI ([*WSB 27/5.1/3 Climate Vulnerability Index*](http://www.waddensea-secretariat.org/sites/default/files/Meeting_Documents/WSB/WSB27/wsb_27-5-1-3_cvi.pdf)) and requested the TG-C and TG-WH to prepare a proposal to further elaborate on the initiative.

The attached draft WSB document contains a proposal by TG-C for development and application of the CVI in the Wadden Sea World Heritage Property and associated resources. TG-WH is invited to comment before submission to WSB.

**Proposal: The meeting is invited**

1. **To support the development of a CVI for the Wadden Sea WH as a pilot for other WH sites,**
2. **to endorse respectively comment on the document for submission to WSB 28**



Wadden Sea Board

**WSB 28**

14 March 2019

Berlin, Germany

**Agenda Item:**

**Subject: Development of a Climate Change Vulnerability Index (CVI) for the Wadden Sea World Heritage**

**Document No.:** WSB 28//

**Date:**

**Submitted by: TG-C, CWSS**

Climate change is a growing threat impacting World Heritage (WH) properties worldwide. The consequence is a decline in the values that collectively comprise the Outstanding Universal Value (OUV) for many WH properties.

For a systematic global assessment of climate change related threats and risks to OUVs of World Heritage properties, a Climate Change Vulnerability Index (CVI) is being developed by Jon Day (ARC Centre for Coral Reef Studies, James Cook University, Townsville, Australia), former manager at the Great Barrier Reef Marine Park Authority, and colleagues. The CVI methodology was recently trialed in a workshop at Shark Bay World Heritage Area in Western Australia and CVI discussions and further activities are envisaged at several World Heritage Sites worldwide.

The Task Groups Climate and World Heritage were instructed at WSB27 to assess effort for the groups and impact for the Trilateral Wadden Sea Cooperation (TWSC) for the Wadden Sea World Heritage Area to be a pilot site for the CVI. This document contains a proposal by TG-C, developed in cooperation with TG-WH, for development and application of the CVI in the Wadden Sea World Heritage Property and associated resources.

**Proposal:** The WSB is requested to endorse the development to a CVI for the Wadden Sea World Heritage and to provide the required resources to pilot the CVI.

**Version Log (for internal overview; will be deleted before submission)**

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| --- | --- | --- | --- |
| **Issue Date** | **Version** | **Author** | **Change** |
| 2018-12-13 | v0.1 | JB, HM (CWSS) | First draft of the document  |
| 2019-01-05 | v0.2 | RZ (TG-C) | Second draft |
| 2019-01-08 | v0.2 | SHK (TG-C) | General comments |
| 2019-01-11 | v0.3 | JB, RZ (CWSS, TG-C) | Response to changes; third draft to be forwarded to TG-WH. |

**Proposal: Wadden Sea World Heritage as pilot site for the development of the Climate Change Vulnerability Index (CVI)**

Background

The Trilateral Wadden Sea Cooperation (TWSC) addresses climate change as overarching theme, e.g., to targets described in the Wadden Sea Plan 2010, and by a climate change adaptation strategy (CCAS), which includes priorities for implementation. The extent to which the variety of climate change drivers (and which of these most) will impact the OUVs of the Wadden Sea is, however, not yet clear. So far, no coherent tool is available to assess climate change vulnerability of the Wadden Sea World Heritage Property. Therefore, TG-C and TG-WH propose the Wadden Sea World Heritage to be a pilot site for the development of a global assessment tool, the Climate Change Vulnerability Index (CVI).

The climate change vulnerability index (CVI) is being developed as a rapid assessment tool for a systematic global assessment of climate change related threats and risks to OUVs of UNESCO World Heritage Properties. The CVI is being developed by Jon Day (ARC Centre for Coral Reef Studies, James Cook University, Townsville, Australia), former manager at the Great Barrier Reef Marine Park Authority, and colleagues. It is based on a risk assessment approach and systematically considers the exposure to key climate change drivers and their potential impact, the adaptive capacity, and the economic, social and cultural consequences of climate change on the property. It is designed to be undertaken either by experts at a thematic level or by site managers at the property level.

The CVI is not a finished product. The application on the Wadden Sea must be considered as a pilot. This project plan comprises of a first (rapid) step towards assessing the impact of climate change on the Wadden Sea. The results of this process will result in information that is necessary for further discussions on the need and decision making on climate change adaptation plans.

The application of the CVI method will potentially support addressing the Leeuwarden Declaration, in particular in **identifying priority areas of the CCAS (§27)** and to better understand the impacts of climate change on the Wadden Sea ecosystem and to be prepared to enhance the level of **adequate management to safeguard the OUVs of the Wadden Sea (§28)**, e.g., by determination of key drivers of climate change and by assessing how vulnerabilities change under different scenarios. In future, regular assessments may reveal changes in vulnerability and priority areas for management actions.

Objectives and results

The overall objective is **to assess the vulnerability of the Wadden Sea to climate change and to set the priorities for climate change adaptation for the TWSC.** The primary focus in this assessment will be on the geomorphological and ecological/biological system as these systems are closely related to the OUV of this world heritage site. Furthermore the following (sub)objectives are formulated for this pilot project:

**Sub-objective 1:** Assess the vulnerability of the OUV of the Wadden Sea World Heritage site to climate change;

**Sub-objective 2:** Raise awareness for the consequences of climate change on the Wadden Sea (eco)system and support communication on the possible impact of climate change;

**Sub-objective 3:** Involve different government layers and stakeholders in the discussion on climate change adaptation;

**Sub-objective 4:** Contribute to the development of a coherent tool (the CVI) to assess the vulnerability of World Heritage properties to climate change.

**Amongst others, the following associated (research) questions will be tackled:**

* *Can the CVI be used for the Wadden Sea with its diversity and as a serial property across three countries?*
* *Which are key climate change drivers/stressors leading to impacts on OUV of the Wadden Sea World Heritage property and what is their potential impact?*
* *Which are priority issues for climate change adaptation for the TWSC and which are priorities for implementation of the CCAS?*

The development and successful application of the CVI method in the Wadden Sea World Heritage Area as pilot site will aid in answering the questions above and lead to the following two main outcomes:

**Outcome 1**: Standardised tool for rapid assessment and reporting to TWSC and UNESCO (State of Conservation reports, periodic reports – next WH Periodic Reporting Cycle due in 2022/23) and for trilateral scientific reports (QSR, QSR synthesis report).

**Outcome 2**: Report/memo describing the possible impact of climate change on the Wadden Sea (eco)system, supporting climate change adaptation management. This includes an assessment of the vulnerability of the Wadden Sea´s OUV to climate change (compare shark bay example: <http://nespclimate.com.au/wp-content/uploads/2016/03/SBWHA-CC-workshop-report.pdf>).


**Figure: principle of the assessment of vulnerability in the CVI process.**

Work programme and resources

**Timeline of project**: March 2019 – February2020

**Partners:** TG-C (lead), TG-WH, additional TWSC groups as appropriate, Mr. Jon Day and colleagues, as well as external stakeholders.

**Approach:** The CVI approach is currently under development. Therefore it will be applied to the Wadden Sea World Heritage in a learning-by-doing approach. This will result in both, the assessment of climate change vulnerability to the Outstanding Universal Value of the Wadden Sea World Heritage and at the same time a contribution to method development of the CVI. The present work programme contains a proposal that will result in a first assessment of a climate vulnerability index for the Wadden Sea. If this gives promising and useful results it can be decided later to elaborate it more.

The pilot of the CVI will consist of the following main steps:

1. Define and discuss the different climate change stressors for the Wadden Sea and discuss their possible impact;
2. Agree on the climate scenarios for making the CVI (year and climate change scenarios);
3. Find consensus on the stressors with the highest risk (= likelihood and consequence) for the OUV of the Wadden Sea and focus on those;
4. Develop diagrams of key climate change stressors impacting the highest risk values and determine the related physical, ecological impact. Social and economic impact will be assessed if possible, but has no priority;
5. Learn from the process and make recommendations for the CVI method.

Three work packages have been defined to deal with these steps: preparatory work, a workshop and the CVI assessment.

Main effort of the assessment is expected in an expert workshop similar to a workshop carried out at the Shark Bay World Heritage (Western Australia) in autumn 2018.

**Work packages:**

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| **Work package title** | **1. Preparatory work**  | Duration: April – Jun 2019 |
| **Participants** | TG-WH (lead), TG-C, CWSS, 1-2 external experts |
| **Objective** | Preparation of input for CVI trial for Wadden Sea  |
| **Description of work** | **Task 1.1 Assessment of attributes** of OUV of the Wadden Sea World Heritage property (including consideration of WSP2010 targets) during TG-WH regular meeting and/or commissioned work. Input: List prepared at QSR workshop in June 2015 (Martin Baptist).**Task 1.2 Literature review vulnerability studies** in the Wadden Sea Area (External).Task 1.3 Update list of climate stressors and pre-discuss priority for climate stressors and set outlook/climate scenarios for CVI (TG-C) |
| **Deliverable** | D1.1 List of attributes to OUV of Wadden Sea World Heritage propertyD1.2 Report on vulnerability studies Wadden Sea D1.3 List of climate stressors for the Wadden Sea and outlook CVI |
| **Effort** | **Person months (PM):** **0.88**External: 0.60 PMTWSC groups: 0,23 PM (covered by regular meetings)CWSS: 0.05 PM, incl. admin. activities | **Costs: 10,000 EUR**Attributes: Commissioned (TG-WH), within WH SP budget: 5,000 EURLiterature review: Commissioned (TG-C) 5,000 EUR |

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| **Work package title** | **2. Workshop: CVI for Wadden Sea – expert workshop** | Duration: October 2019 |
| **Participants** | TG-C & Mr Day (lead), TG-WH, CWSS, approx. 15-25 trilateral external experts & stakeholders (managers/national park authorities, NGOs, researchers/climate science,..)  |
| **Objective** | Determination of three key drivers of climate change for OUV attributes and assessment of vulnerability |
| **Description of work** | **Task 2.1: organisation of a workshop.**Organisation of an expert workshop. During the workshop the core of the CVI is to be discussed, and as far as possible, strive to get consensus on the most important risks for the OUV by climate change.During the workshop the following items will be presented or discussed with the experts:* Present OUV and their attributes, share results of preliminary work on stressors and possible impacts of climate change
* Discuss the possible **impact of climate change stressors** on all attributes of OUV including a time scale prioritised by attendees and **selection of three main drivers** (all workshop participants)
* Assessment of likelihood of future exposure (*very likely, likely, possibly, unlikely, very unlikely*) and sensitivity of the OUV to each of the three drivers and future consequences (*catastrophic, major, moderate, minor, negligible*). Aspects of temporal frequency and trend, spatial scale of impact, and any compounding factors should be considered to determine the risk of potential impact of each climate driver and **determination of risk** by likelihood x consequence (*low, moderate, high, extreme*) (work in small groups)

Optional (maybe to be done in Work Package 3 if time during workshop is insufficient): **Determination of vulnerability** by assessing risk and adaptive capacity (possibly change of vulnerability under different scenarios) (all participants). |
| **Deliverable** | D1.1 rev: Revised list of attributes to OUV of Wadden Sea World Heritage property (TG-WH)D1.3 rev: Updated list of CVI climate stressors and selection of most relevant ones (TG-C, Mr Day)D2.1: (short) workshop report, describing result of expert discussions a.o. on the main climate stressors, potential impact of those on the OUV and assessment of risk (*low, moderate, high, extreme*) and adaptive capacity (TG-C, commissioned post processing)D2.3: Insights / lessons learned on CVI method (Mr Day) |
| **Milestone** | **M1 Successful trial of CVI for Wadden Sea** |
| **Effort**  | **Person months: 5.83**External: 5.13 PM (25 persons, 4 days)CWSS: 0.5 PM (incl. preparatory work) | **Costs: 10,000 EUR**Workshop facilitation incl. reporting: 6,000 EURTravel Jon Day/Scott Heron: 4,000 EUR |

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| **Work package title** | **3. Assessment of CVI Wadden Sea World Heritage Property**  | Duration: February 2020  |
| **Participants** | TG-C (lead), TG-WH, external experts |
| **Objective** | CVI assessment on Wadden Sea OUV |
| **Description of work** | If M1 has been successfully completed and the CVI method development allows, an assessment of the CVI will be conducted. Complexity of this task depends on outcome of WP2.Task 3.1: Finalise the CVI assessment on basis of results from the workshopTask 3.2: Advise for further application of CVI in the Wadden Sea and further development of the method in general. |
| **Deliverable** | D3.3: Overall report with results of pilot “CVI for the Wadden Sea World Heritage”  |
| **Effort**  | **Person months: 0.38****Person months: 3.13**External: analysis and reporting 5 days)CWSS: 0.5 PM (reviewing) | **Costs: 5,000 EUR**Reporting / Post processing: 5,000 EUR |

**Cost estimate:**

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| **WP** | **Activity (year)** | **Estimated cost** | **Covered** | **Open**  |
| WP1 | Assessment of attributes of OUV (2019) | 5.000,00 €  | 5.000,00 €  | - €  |
| WP1 | Literature review climate/vulnerability studies (2019)  | 5.000,00 €  | - €  | 5.000,00 €  |
| WP2 | Workshop 1 (2019) | 10.000,00 €  | - €  | 10.000,00 €  |
| WP3 | Assessment of CVI / reporting | 5.000,00 €  | - €  | 5.000,00 €  |
|  |  | **25.000,00 €**  | **5.000,00 €**  | **20.000,00 €**  |

**Financing of 20,000 EUR needed for 2019**