SCOPAC
STANDING CONFERENCE ON PROBLEMS ASSOCIATED WITH THE COASTLINE

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# Supplementary Information

I am now able to enclose, for consideration at next meeting of the Standing Conference on Problems Associated with the Coastline (SCOPAC) to be held on 16 January 2015, the following supplementary information that was unavailable when the agenda was printed.

| Agenda No | Item | |
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| | Report by Sam Cope | |

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# PAPER B

Purpose : For Discussion

Committee: **SCOPAC**

Date: **JANUARY 2015**

Title : **RESEARCH PROGRAMME**

**REPORT OF THE CHAIRPERSON OF THE SCOPAC RESEARCH SUB-GROUP**

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## 1 CURRENT RESEARCH PROGRAMMES

### 1.1 SCOPAC MINOR PROJECTS FUND (2013/2014 AND 2014/2015)

Following the Southern Coastal Group meeting in July 2013 it was agreed the following two Minor Projects would be funded for 2013/2014 and 2014/2015.

*Minor contribution of £4,000*

The University of Southampton was awarded £4,000 as a contribution towards a project which is examining the movement of sediment within Poole and Christchurch Bays.

During October 2014, 60 sediment samples were collected from the Dolphin Bank and Dolphin Sand in Poole Bay. These have been sieved in the sediment lab to establish grain size, with the next step being grain trend modelling/analysis. This, along with analysis of Regional Coastal Monitoring data will identify sediment transport directions and sources around Poole and Christchurch Bays which will inform the update of the Sediment Transport Study.

Recommendation: For information

***Channel Coastal Observatory – Seabed mapping project***
*Minor contribution up to £4,000*

The Channel Coastal Observatory was awarded £4,000 as a contribution towards seabed mapping a 40km$^2$ block of the 2013 East Solent swath bathymetry.

The 40km$^2$ block has now been mapped and shows a variety of sediment textures, from bedrock, thin veneer of sediment, significant sediment deposits and mobile bedforms. The outputs will feed directly into the update of the Sediment Transport Study. The report and shapefiles have been emailed to the SCOPAC Research sub-group for comment and will now be uploaded onto the SCOPAC website.

Recommendation: For information

## 1.2 SCOPAC MINOR PROJECTS FUND (2015/2016 AND 2016/2017)

Following the Southern Coastal Group meeting in December 2014 it was agreed that SCOPAC would benefit from funding the following two Minor Projects for 2015/2016 and 2016/2017 (see Appendix B1 for more information).

Dr Uwe Dornbusch (Environment Agency): Establishing shingle transport pathways from the sub-tidal to the beach: Church Norton Spit - £4,000

Dr Andy Pearce (Eastern Solent Coastal Partnership): Beach response in front of structures in open coast - £4,000

Recommendation: For approval

## 1.3 UPDATE OF THE SCOPAC SEDIMENT TRANSPORT STUDY

*Channel Coastal Observatory £150,000 (2013-2016) – funded by the Environment Agency with contributions from SCOPAC*

The SCOPAC Sediment Transport Study (2004) is being updated by the Channel Coastal Observatory (http://www.scopac.org.uk/sediment-transport-update.html). The last update was undertaken in 2004 by the original authors, Dr Malcolm Bray, Dave Carter and Prof Janet Hooke. Since 2004 a wealth of data has been collected by the South-east and South-west Regional Coastal Monitoring Programmes. This data, along with new literature is being incorporated into the update.

Progress to date:

- Literature review undertaken for the following units:
    - Start Point to Berry Head
    - Berry Head to Hope's Nose
    - Hope's Nose to Holcombe
    - Holcombe to Straight Point
    - Straight Point to Otterton Ledge
    - Beer Head to Lyme Regis
    - West Bay to Portland Bill
    - Isle of Portland to Weymouth Bay
    - Redcliff Point to Durlston Head
    - Durlston Head to Handfast Point
    - Handfast Point to South Haven Point
    - Christchurch Bay
    - North-west Isle of Wight
    - North-east Isle of Wight
    - West and south Isle of Wight
    - South and east Isle of Wight
    - Pagham Beach to Shoreham-by-sea
    - Shoreham-by-sea to Beachy Head
- Original maps reproduced in GIS
- Wave roses mapped

The project is currently:

- Literature reviewing the remainder of the units
- Applying the sediment budget analysis equation

Recommendation: For information

## 1.4 REDUCING REGIONAL FLOOD AND EROSION RISK FROM WAVE ACTION ON THE CHANNEL COAST PROJECT

*Channel Coastal Observatory £250,000 (2014-2017) – funded by the Environment Agency with contributions from SCOPAC*

A region-wide assessment to examine the impacts of combined swell and storm (bimodal) waves on the shingle beaches of the SCOPAC region is being undertaken by the Channel Coastal Observatory. The three year study is investigating improvements to definition of standards of service for coastal schemes, improved flood forecasting, and improved definition of design wave conditions.

The test facility at HR Wallingford was used to undertake the modelling. Initial tests on a standard beach profile demonstrated a correlation between an increase in the storm berm elevation and landward migration of the storm berm, with increasing swell. Site specific modelling was undertaken for Hurst Spit, Chesil Beach and Hayling Island, whereby actual storm events were tested on a measured profile. Analysis of the results are ongoing.

Recommendation: For information

## 1.5 SOUTHERN COASTAL GROUP WORKSHOP

The sixth SCOPAC workshop in the series, "Andy's Workshops: A Problem Shared" was on *Incident Management* and was held at the National Oceanography Centre on 9th January 2015. The aim of the workshop series is to share best practice and to assist operating authorities with basic skills development.

Approximately 50 delegates - coastal engineers, scientists, planners, a police inspector, students, consultants and contractors attended the workshop, which commenced with Neil Watson (Chairman of the Southern Coastal Group) providing background information and potential tools for managing a flood or coastal erosion incident.

The talks focused on the following aspects of incident management at the coast:

- What is classed as an incident and how is it categorised as major, minor etc?
- What triggers a major incident?
- Who formally makes it a major incident?
- What are the protocols to follow?
- What happens in reality?
- Who is involved in incident management?

Case studies of incident management from the recent 2013/2014 winter storms were presented for Chesil beach, Milford, Lymington, Portsmouth, Hayling Island, Broadmarsh and Wallington River.

The workshop came to a close with a question and answers session, whereby delegates submitted a question together with a photo relating to incident management on the coast.

Programme:

- Introduction to the workshop from Neil Watson (SCG chairman)
- Incident management protocols from Sarah Comely (Environment Agency)
- Incident planning and response from John Elliott (Environment Agency)
- Chesil beach case study from Grant Armfield (West Dorset and Weymouth Council)
- Valentines Day storm incident management by Peter Ferguson (New Forest District Council)
- Examples of incident management on the Eastern Solent Coastal Partnership frontage by Caroline Barford and Caroline Timlett (Eastern Solent Coastal Partnership)

Recommendation: For information

**1.6 MONITORING OF POOLE NEARSHORE REPLENISHMENT TRIALS**
*Channel Coastal Observatory £15,000 from SCOPAC and £116,000 from EA R+D fund*

SCOPAC are contributing £15,000 towards the monitoring of a trial which aims to place sand on the seabed and allow natural processes to push it onshore to replenish the beaches in Poole Bay.

Poole Harbour Commissioners will provide the sand from maintenance dredging of Poole Harbour entrance, thereby recycling the sand back into the system, rather than dumping it offshore.

The shoreface renourishment concept has been widely used in the Netherlands since the 1990's given that it is cheaper and less intrusive compared with traditional beach renourishment approaches. The works at Poole Bay will be of national importance given the Sand Motor concept has never been trialled on beaches in the United Kingdom.

The project is likely to commence in January 2015, subject to an MMO Licence and will involve the Borough of Poole working in partnership with Poole Harbour Commissioners, the Environment Agency, University of Southampton and the Channel Coastal Observatory. The monitoring specification has now been approved by the EA and SCOPAC and the Acoustic Doppler Current Profiler (ADCP) has been deployed. This measures the speed and direction and turbidity of water currents using sound waves. With the ADCP installed, any turbidity difference between the trial and conventional beach recharge can be assessed.

Once the MMO approval has been received, the trial can proceed.

Funding will be provided by:

* Environment Agency: £130,000 for the placing of sand on the seabed
* Environment Agency Research & Development Fund: £116,000 for monitoring
* SCOPAC: a further £15,000 towards monitoring costs

Recommendation: For information

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## APPENDIX B1:  SCOPAC MINOR PROJECT BIDS

**Establishing shingle transport pathways from the sub-tidal to the beach: Church Norton Spit**
Proposed by Uwe Dornbusch with support from David Lowsley and Roger Spencer.

**The Problem:**
Church Norton spit has been growing over the last 10 years. The material for this growth must come from the sub-tidal as there is no other input from land or alongshore. Some of the material may move as an integral part of bedforms (green circled in figure below) but some may move using bedforms as a transport path ('finger' in the red circle). This latter transport route, although postulated by Julian Orford in a few papers in the 1990s, remains a general hypothesis that has not been tested anywhere.

**The Project:**
The project will test the hypothesis that these shore perpendicular landforms act as sediment transport corridors and if they do, what the rate of transport will be. This will be achieved using two approaches: 1) a desktop GIS approach to capture changes over the last 10 to 15 years (LIDAR, ground surveys and aerial photography), 2) sediment tracing using the methods developed by the SCOPAC Minor funds project on Sediment tracing 2011-2013.
The project will be carried out by students from the University of Sussex, under direction of Cherith Moses, and University of Southampton, under the direction of David Sear, both of whom work closely with Havant BC supervising a NERC-Case PhD using PIT tag technology to investigate mixed sediment beach dynamics. Both provide high level expertise in sediment tracing and beach dynamics and much of the equipment required. Tracing equipment, acquired by the Selsey Pathfinder project, has recently been transferred free of charge to Havant BC to assist with research and this will be used by the project.

**Benefit to SCOPAC:**
The research will benefit understanding of coastal processes in the eastern part of the SCOPAC area, in particular in an area where coastal decision making is severely restricted by a lack of knowledge about sediment transport pathways and rates of sediment movement from subtidal areas to the beach. It also has the potential to provide international journal exposure due to this hypothesis not having been tested before. It will also contribute to the SCOPAC sediment transport study. The time and labour intensive nature of the project and a lack of funding in the this geographic area would mean that this research would not go ahead without SCOPAC funding.

2001 2013

# ESCP SCOPAC Minor Contribution Proposal: Beach response in front of structures in open coast

## Introduction

Lowering of beaches in front of coastal structures is widely accepted as a leading cause of failure. Beach lowering and toe scour is difficult to detect as the receding tide and storm waves tend to bury this evidence and any damage to structure foundations. Measurements of this process are limited to mostly physical model studies and a small number of field studies (Pearce at al 2006).

The SCOPAC region includes numerous beach structures at risk of scour, with foundations of poorly known depth and condition. Improved understanding of the scour risk at these structures will help SCOPAC members to better manage the scour risk and to design scour resistant replacements.

## Proposed approach

The ESCP propose to undertake a scoping study to develop a cost effective method to determine maximum scour depth in front of coastal structures during a storm event. The first stage of the project would be to conduct a test deployment at the ESCP's own risk to confirm the most effective method for installing scour monitoring equipment into a beach. Subject to a successful test, the ESCP would apply the SCOPAC funding to undertake a deployment at a seawall structure in Winter 2015/16 to measure changes in storm beach levels and maximum scour depth.

It is proposed to install scour chain instruments which comprise a length of steel chain and anchor contained in a tube (Figure 1). The equipment is installed by a mini-digger and at the target depth the steel tube is recovered. Under storm wave conditions the beach level would be expected to fall, causing the chain to deform to suit the storm beach profile. After the storm the beach material would be excavated at the instrument location to reveal the length of deformed chain and allow the maximum scour depth to be measured. At the end of the storm season, all of the equipment would be recovered.

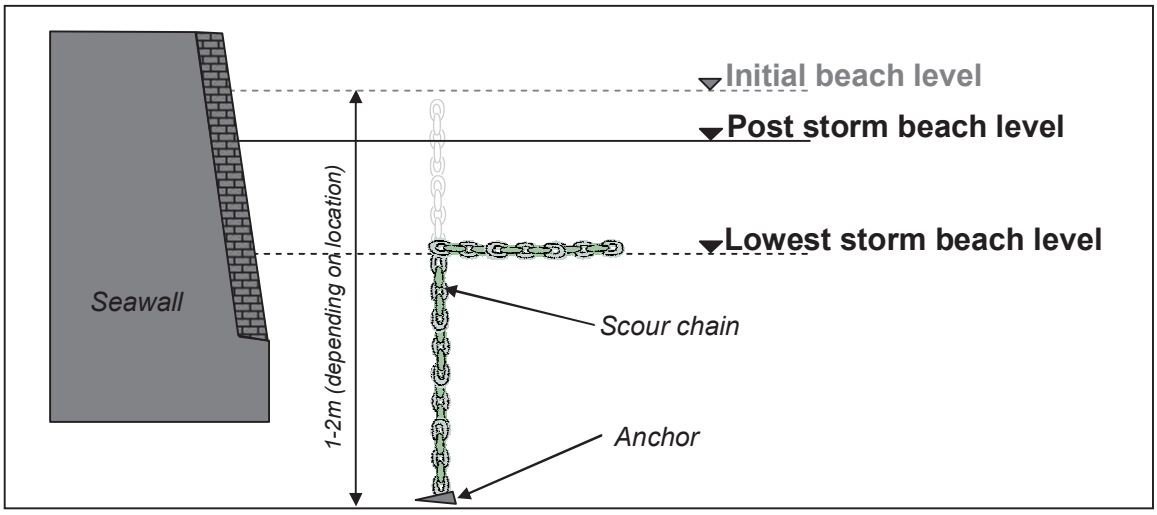


**Figure 1: Indicative cross section of scour chain instrument deployment.**

## Programme and funding

The overall project cost is estimated at £7,000 which exceeds our available funding; however the ESCP would be prepared to fund the initial test deployment stage of the project. Following a successful test, the SCOPAC contribution of £4,000 would be utilised to fund a winter deployment and then report and present the study results.

There would then be an opportunity to consider development of a larger scale experiment to deploy similar instruments across the SCOPAC region, for a range of beach types and structures (seawalls, revetments, groynes and soft cliffs for example).

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