Invitation to tender
Augmented Reality Sandbox

Contact details:
Lucy Butler
The Rivers Trust
GIS Services Manager
lucy.butler@theriverstrust.org.uk

Please send your tender application by 17:00 on 29th September 2017 to Lucy Butler
Introduction to requirements: Development of an augmented reality sandbox to demonstrate catchment-based natural flood management concepts

Working in partnership with the National Flood Forum, the Rivers Trust are helping to lead a 3-year project to help increase the resilience of communities and infrastructure, against flood risk in the UK. FRAMES (Flood Resilient Areas by Multi-lyer Safety Approach) is an EU Interreg VB North Sea Region project funded under the European Regional Development Fund. More information about the project is available HERE.

As part of the project The Rivers Trust wishes to invite applications for the development of an augmented reality sandbox, together with supporting training and engagement resources that can be used as a public engagement tool to demonstrate catchment-based natural flood management (NFM) concepts.

The AR sandbox is a visualisation tool which shows rainfall and flooding in real-time. The AR sandbox software is open source and was developed by the UC Davis W.M. Keck Center for Active Visualization in the Earth Sciences (KeckCAVES, http://www.keckcaves.org), supported by the National Science Foundation under Grant No. DRL 1114663. For more information, please visit https://arsandbox.ucdavis.edu

TASK 1: Develop a physical augmented reality sandbox that will be owned by the River Trust and which can demonstrate catchment-based NFM concepts

The AR Sandbox open source software should be developed so that it can be used to demonstrate the following concepts:

1. How does NFM work? Demonstrate the impact of the following catchment management interventions on runoff and downstream flooding:
   - Woodland planting (increasing catchment roughness)
   - Runoff Attenuation Features
   - Meanders and woody debris (increasing channel roughness)
   - Changing surface permeability

2. Why is flood peak timing important? Demonstrate the concept of flood peak synchronisation/de-synchronisation between tributaries and how this might impact flooding downstream.

3. What is flood risk and how is it traditionally managed? Demonstrate how different rainfall events alter flood risk downstream. Demonstrate how traditional flood defences work. Demonstrate setting back of flood defences. Demonstrate what happens if flood defences become overtopped or breached.

Physical requirements are that the AR Sandbox should be:

- Designed to be easily transportable in a standard sized car and on a pallet by courier;
- Easy to assemble, calibrate and dismantle;
- Robust enough to withstand transport and frequently being dismantled and reassembled;
- Professional looking and safe to use at public events;
- Provided complete with software to enable demonstration of NFM concepts, operating system, all hardware, sand, demonstration components, and travel casing.
TASK 2: Deliver video and/or hard copy training resources (aimed at rivers trust staff) that will enable staff to:

- Set up and calibrate the AR sandbox
- Run simple scenarios to demonstrate key NFM concepts

TASK 3: Deliver a package of supporting engagement materials (aimed at the general public) that will help to explain NFM concepts and support use of the AR sandbox at events. For example:

- Short video(s) of the AR Sandbox in action which could be shared online to demonstrate NFM concepts, e.g. How does catchment flood management work?
- A display board/banner to support use of the AR sandbox at events
- A supporting flyer/aide memoir on NFM e.g. along the lines of the Rivers Trust aide memoir for channel management.

TASK 4: Provide initial training to rivers trust staff and support the Rivers Trust at their first demonstration event

- Deliver a training session for rivers trust staff (including staff from our FRAMES partner trusts). The session should include how to setup and calibrate the AR sandbox, together with best practice tips on how to use the sandbox to engage different audiences and demonstrate NFM and catchment management concepts (e.g. to community flood action groups, flood risk managers, schools, environmental professionals, land managers).
- Deliver a demonstration workshop with the sandbox at the Rivers Trust Autumn (FRAMES) conference which will be held on 8th November 2017.

Timescales and budget:

The project is to be delivered in time to demonstrate the Rivers Trust sandbox at the Rivers Trust Autumn Conference (November 8th 2017). We have an indicative budget of €10k for the project.

Anticipated timeline of activity is as follows:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Date</th>
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<tbody>
<tr>
<td>Out to tender</td>
<td>Friday 15th September</td>
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<tr>
<td>Closing date for tenders</td>
<td>Friday 29th September 17:00</td>
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<tr>
<td>Award of contract</td>
<td>Tuesday 3rd October</td>
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<tr>
<td>Demonstration of completed AR Sandbox at Rivers Trust Autumn conference</td>
<td>Wednesday 8th November</td>
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<tr>
<td>Completion of all training and support materials</td>
<td>Friday 15th December</td>
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Tender evaluation: Tenders will be assessed on the following criteria:

**Quality and methodology** (80%) – Quality assessment will consider the written response to the brief and the supplier’s ability to carry out the brief to the timescales given, including details of any relevant experience.

**Price** (20%)

Successful companies will be evaluated on the quality and costs of the service with certain scores and weightings applied to achieve the most advantageous tender.
The overall score will be marked out of 100.

<table>
<thead>
<tr>
<th>Evaluation criteria</th>
<th>Max score</th>
<th>Details to be included</th>
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<tbody>
<tr>
<td>Relevant experience, and expertise of delivery team (max 400 words)</td>
<td>60</td>
<td>- Experience and knowledge of delivery team. Please provide details of the core team who will manage and deliver the project. (max score 20)</td>
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|                                                               |           | - Please detail previous experience in developing engagement tools such as the AR Sandbox, in particular any experience you have in:  
|                                                               |           |   • using the AR Sandbox open source software;  
|                                                               |           |   • developing such tools to demonstrate natural flood management concepts; and  
|                                                               |           |   • using such tools to engage different audiences (max score 40)                                                                                                                                                  |
| Approach, deliverables and timescales (max 400 words)          | 20        | - Please provide a brief overview of your proposed approach, including details of the key outputs and deliverables you will provide in line with the specification. (max score 10)                                              |
|                                                               |           | - Please provide a timeline of activity to demonstrate how you will ensure the project is delivered to meet the deadlines. (max score 10)                                                                               |
| Price                                                          | 20        | - Please provide a quotation and breakdown of costs against tasks as detailed in the specification. Costs will be scored as follows: Lowest quotation = full available marks then for each other quote: lowest quotation received divided by your quoted price and multiplied by 20. |

**Instructions:**

Please send your tender application by email to lucy.butler@theriverstrust.org by Friday 17:00 on 29th September 2017.

Any tenders received after this date and time will be rejected. The Rivers Trust cannot accept any responsibility for postal or email delivery delays.