



OneRTM: an online real-time modelling platform for the next generation of numerical modelling

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- Problems with interrogating conventional environmental models
 - ◆ *updating models is costly and time consuming; hard for users to access models results; hard for users to directly interrogate models.*
- Why OneRTM is unique?
 - ◆ *Models are automatically up to date and always available;*
 - ◆ *Low system maintenance costs;*
 - ◆ *Results immediately available via web browsers & potentially mobiles;*
 - ◆ *Non-modellers can directly use models and easily understand outputs.*
- Its prototype has been successfully developed and tested for the groundwater flow modelling in the Thames Basin, UK
- It is an innovative way for developing, disseminating and maintaining numerical models



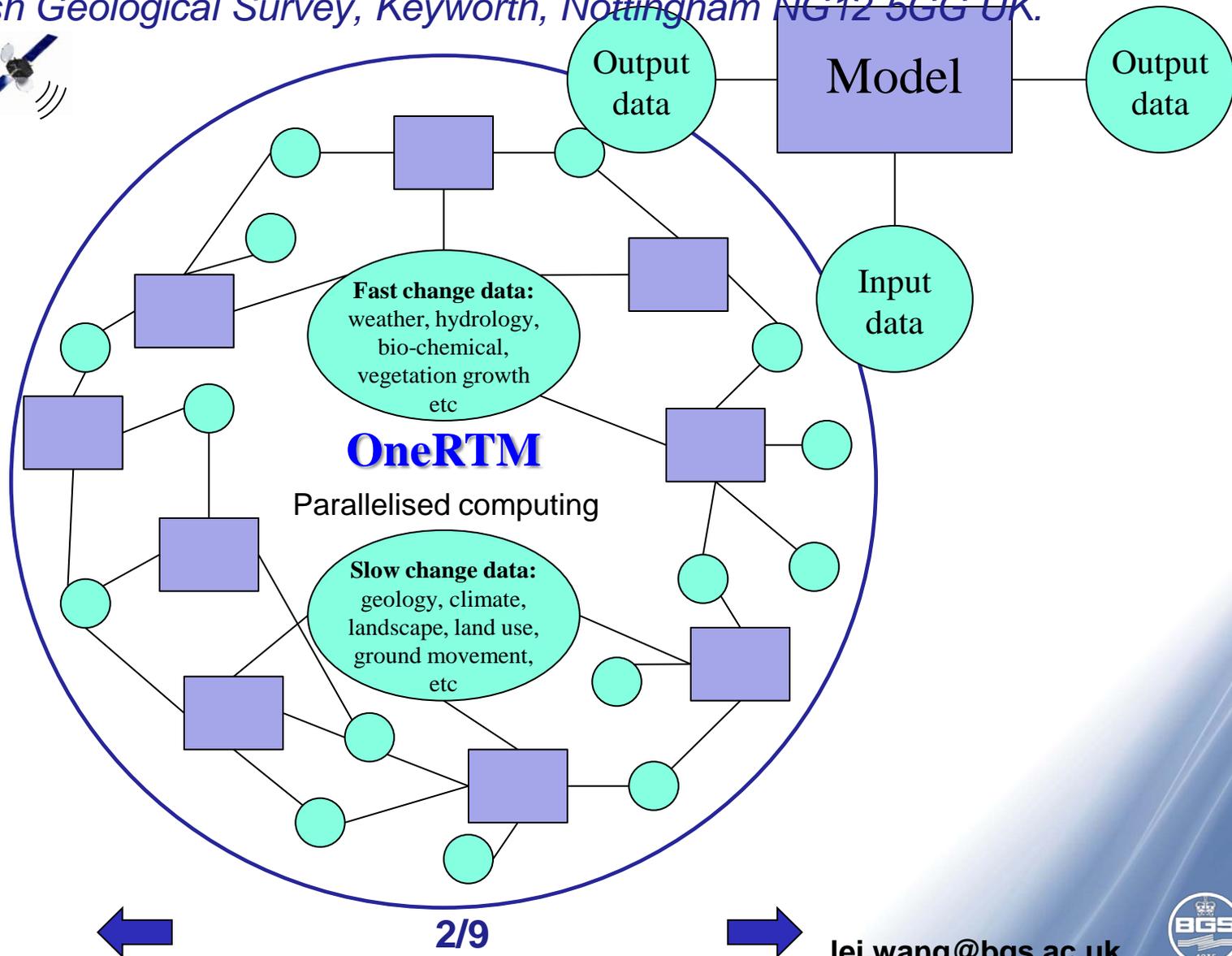
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The vision of
OneRTM



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The potential users of the OneRTM



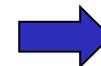
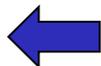
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Background – current problems

- The problems of the traditional ways for numerical modelling
 - ◆ Models are built using historic data for certain period of time;
 - ◆ It is costly and time consuming to keep models up to date;
 - ◆ It is hard for client to get results quickly;
 - ◆ The modelling work and interpretation of modelled results rely on professional modellers.
- The conventional way has a limited value in supporting quick decision making in this changing world;
- Not suitable for improving the national capability for fast response to extreme events; and
- Low accessibility and being out of date would hinder the integrated modelling in the increasing interdisciplinary research



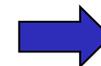
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OneRTM solution

- OneRTM method
 - ◆ Models in the platform are ***always up to date automatically*** with ***low system maintenance costs***;
 - ◆ ***Linked Models*** and modelled ***results*** (historic, real-time and forecasted data) are ***immediately available via the web browser*** and ***ultimately mobile devices***;
 - ◆ ***Non-modellers*** can test scenarios by few mouse clicks in browsers, and easily understand the results presented using GIS maps and graphs.
 - ◆ ***Automated hazard alerts*** sent when thresholds are crossed allowing decision makers to consider remedial actions
- It will change how numerical models are developed, disseminated and maintained



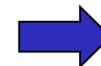
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Current development status

- The OneRTM development started from 2010 funded by British Geological Survey (BGS) and Natural Environmental Research Council (NERC)
- A prototype of OneRTM has been successfully developed and tested using recharge and groundwater flow models in the Thames Basin, UK
- OneRTM will be further developed by working with IT and water companies, funded by the Technology Strategy Board of the UK



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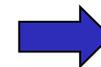
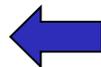
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OneRTM interface examples

The collage illustrates the OneRTM interface through several examples:

- Home Page:** Shows the OneRTM logo, navigation tabs (Key, Data, Location, Search, Print, Measure, Hydro), a map of the London area, and a data table with columns for month and year.
- Hydrograph Generation:** A dialog box titled "Generate Hydrograph" prompts the user to click the "Generate Hydrograph" button on the map. Another dialog box titled "Run Abstraction Scenario" prompts the user to enter the number of pumping stations.
- Groundwater Hydrograph:** A line graph titled "Groundwater hydrograph at (453578.2, 176504.4)" showing groundwater levels (m) from 2004 to 2009. The mean level is 80.82 m.
- Comparison of Hydrographs:** A line graph titled "The comparison of groundwater hydrographs at (455694.8, 175049.2)" showing original groundwater levels (GWLs) and new scenario GWLs from 2000 to 2008. The original mean is 72.72 m and the new scenario mean is 71.77 m.
- Groundwater Histogram:** A bar chart showing the frequency of groundwater levels, with the x-axis ranging from 74 to 86 m.
- Email Alert:** A screenshot of an email alert from OneRTM@bgs.ac.uk, dated 16/09/2013 15:31. The subject is "OneRTM Real Time Email Alert". The message states: "Dear OneRTM user, Your request for running abstraction scenario in the OneRTM system has been successfully finished. Please check the hydrograph, which shows the impact of the new pumping borehole(s) on the groundwater level at the location of (450872, 177232). Please contact with OneRTM team for any question or comment about the system. Thanks, With Regards, The OneRTM Alert System. Email: OneRTM@bgs.ac.uk"



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The vision of OneRTM

- OneRTM can be developed into a platform to host and link many models to represent environmental and socio-economical processes in real time;
- It could be an online centre/community allowing people to share/trade models and datasets;
- It could potentially become a strategic information infrastructure supporting interdisciplinary research and enhancing national capabilities in quick response to extreme events.

