D-NA3.2.3: Training and user documentation: final report

23/11/2015

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Author(s):[1]	T. Garth, X. Wang
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0.2	X. Wang (ULIV)	25/09/2015	Documentation, videos and Summary of Progress throughout the project
0.3	T. Garth(ULIV)	25/09/2015	Training and user manual documentation added, along with an executive summary of this reporting period.
0.4	X. Wang (ULIV)	28/09/2015	Update Documentation, Summary of Progress throughout the project
1.0	T. Garth (ULIV)	29/09/2015	Responded to internal reviews of Malcolm Aktinson & Heiner Igel.
2.0	T.Garth (ULIV)	20/11/2015	Final polish of document and addition of information of content uploaded since September.

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[1] Alphabetical order

Contents

Executive summary

This reporting period saw the transition in the outreach training style from web based training to face-to-face training events. The final online training was held in October 2014, and covered the data-intensive methods that have been developed and are supported by the VERCE project. This online training, and the online training on the VERCE portal that happened in the previous reporting period then led on to the first face-to-face training for external attendees, which was held at the LRZ in Munich, Germany, from the 9th – 11th March 2015. This extremely productive training event introduced twelve trainees to the VERCE platform and associated resources and tools. The feedback was overall extremely positive, but also left us with feedback to improve the training for the final training event.

The 'VERCE summer school' was the final training event held from the 1st – 3rd July 2015 at the University of Liverpool, UK. The experience gained from the previous training events meant that the training was run very smoothly and received extremely positive feedback, engaging many young researchers in computational techniques that would otherwise be beyond their grasp. This event had fourteen attendees, and also achieved a greater impact at institutions outside the VERCE project, with over 70 % of the attendees coming from external institutions. Overall the face-to-face training events in this reporting period attracted twenty-four attendees, from fourteen different institutions.

The training materials from these events have been posted on-line, along with instructional videos on using the portal. This online documentation has been complimented and drawn together by the VERCE manual titled, '*The VERCE Portal – a user's guide*'. This guide offers a starting point for anyone wanting to use the portal who has not attended a training event, as well as offering a stepping off point for the more advanced resource and online tutorials that are available through the VERCE training pages, as well as for externally hosted resources.

1   Work progress

1.1   VERCE Training

1.1.1   Online training

During this reporting period the second online training event was run. The training was again run using *adobe connect* software hosted at the University of Liverpool. The second online training concerned '*Data-Intensive Processing*', and focused on covering the methods developed to address the data-intensive use cases identified in the VERCE project. The format of the training was based on the previous webinar (run in the previous reporting period) and was informed by the experience gained there.

The session involved online presentations, as well as practical aspects that the attendees ran on an external machine hosted by the LRZ. The practical exercises were done through iPython notebooks, that could be viewed on the attendees own computer through a web browser. These iPython notebooks were made available to the attendees after the training.

Attendance at the webinar was relatively low, but this reflects the advanced and specialised nature of the training. For this reason it was decided that the training for the two work packages should be done together for the face-to-face training events. The presentations given in both of the webinars have been uploaded to the VERCE website as an online resource as described in section 2.2.3 of this document.

Figure 1: *The online training materials for the 'Data-Intensive Processing with Dispel4py' webinare, available at http://verce.eu/Training/UseVERCE.php*

1.1.2   Training at the LRZ, Munich

This first external training event was held at the LRZ in Munich, Germany, from the 9th – 11th March 2015. The training was designed to get users familiar with and using the VERCE platform, but also to give them an introduction to resources such as ObsPy and more advance tools such as dispel4py.

The training event was well attended, and had an extremely pleasant and vibrant atmosphere. This environment provided a massive opportunity for discussions on the potential future uses of the platform, as well as getting good feedback from a large pool of users on ways to improve the interface and functionality of the resource.

There was generally a high level of programing skill (especially in Python) which meant that the more advanced topics, such as the use of dispel4py for creating new workflows, was well received. The fact that we had long discussion and practical sessions also allowed ample time to deal with individual technical glitches, and to offer extra help to attendees who found the subjects more challenging.

The training had twelve attendees, the majority of whom were from German institutions. Only 17 % of the attendees were from institutions that are not part of the VERCE project, so this was a point that we aimed to improve on for future training events. The feedback survey was completed by 92% of the attendees, and included both quantitative feedback, and qualitative written feedback to allow us to improve the training content for later training events.

The overall feedback for the training was very good with 100 % of those who completed the survey agreeing or strongly agreeing that the presentation and demonstrations on the VERCE portal were of interest to them. Additionally over 90 % of those who completed the feedback survey agreed or strongly that they were more likely to use the portal because of the training.

The feedback was less strong for the data intensive applications with only 50 % of the attendees finding the subjects of great interest. This is perhaps not surprising given the more technical and specialist nature of this part of the training. The training did however succeed in convincing the attendees to use data intensive methods supported by VERCE, with two thirds (67 %) of the survey agreeing or strongly agreeing that they would be *'likely to use VERCE for data intensive seismology'*. This strong result is also backed up by 75 % of the survey response agreeing or strongly agreeing that they would be '*likely to use VERCE for waveform modelling'.*

1.1.3   Liverpool summer school
The final VERCE training was held at the university of Liverpool form the $1^{st} – 3^{rd}$ of July 2015. The training was mainly based on the timetable put together for the Munich training, but also incorporated several improvements based on the feedback given for the previous training session. This included;

- Better preparation documents including a Python primer
- Better build up to dispel4py, in order to engage more of the group
- More structured evening activities and social time, which allowed continued scientific discussion

We also incorporated aspects of the training that were particularly popular from the Munich training including;

- Plenty of time for discussion of potential uses
- Plenty of time for using and exploring with the portal without too many specific tasks being set.
- Mixing the relatively informal training sessions with more structured talks and presentations

The training event was again well attended with fourteen attendees from eleven different institutions. The summer school also achieved a much greater attendance rate from institutions that are not involved in the VERCE project, with over 70 % of the attendees being attracted from other institutions. The extremely positive feedback for this presentation reflects the fact that this was now the fourth training event most of the organisers and trainers had been involved in. Therefore the

overall structure and the content of the presentations and practicals had been gradually improved and refined.

For the training based on forward modelling use case over 92 % of those who completed a feedback survey agreed or strongly agreed that the presentation subjects were of interest to them and 84% also found the demonstrations of interest. Moreover 100 % of survey responses agreed or strongly agreed that the presentations were clear, informative and at an appropriate level for them. This represents a significant improvement on the already positive feedback from the previous training event in Munich. The impovement in feedback is summarised in figure 2 bleow.

By far the biggest improvements in feedback though came from the training on the data-intensive use case. Where over 90 % of responses found the presentations and demonstration interesting, clear informative and pitched at the appropriate level, with 100 % of the responses agreeing or strongly agreeing that the demonstrations were particularly clear and informative.

Name	Institution	Subject	Training event
Heiner Igel	LMU	Introduction to the Munich training event	Munich training
Cerlane Siew	LRZ	Overview of certification and security in the platfrom	Forward modelling webinar, Munich trainiing.
Alessandro Spinuso	KNMI	Introduction and background of the VERCE portal/platform	Forward modelling webinar, Munich trainiing, Liverpool summer school.
Federica Magnoni	INGV	Using the portal, and background in computational seismolgy	Forward modelling webinar, Munich trainiing, Liverpool summer school.
Emanuele Casarotti	INGV	Preparing meshes for the VERCE platfrom	Munich trainiing, Liverpool summer school, TIDES workshop.
Lion Krischer	LMU	Using ObsPy	Munich trainiing, Liverpool summer school.
Malcolm Atkinson	University of Edinburgh	The principles of dispel4py	Data intensive webinar, Munich trainiing, Liverpool summer school.
Amy Kraus	University of Edinburgh	Details of dispel4py, and pratical sessions using dispel4py.	Data intensive webinar, Munich trainiing, Liverpool summer school.
Rosa Filgueira	University of Edinburgh	Details of dispel4py, and pratical sessions using dispel4py.	Data intensive webinar, Munich trainiing, Liverpool summer school.
Tom Garth	University of Liverpool	Cooordinated the training events and chaired the training and discussion sessions	Forward modelling webinar, data intensive webinar, Munich trainiing, Liverpool summer school.
Andreas Rietbrock	University of Liverpool	Introduction to the Liverpool training event	Liverpool summer school

Table one: Summary of presenters at trhe VERCE tranining events

a) Satisfcation with training on VERCE portal

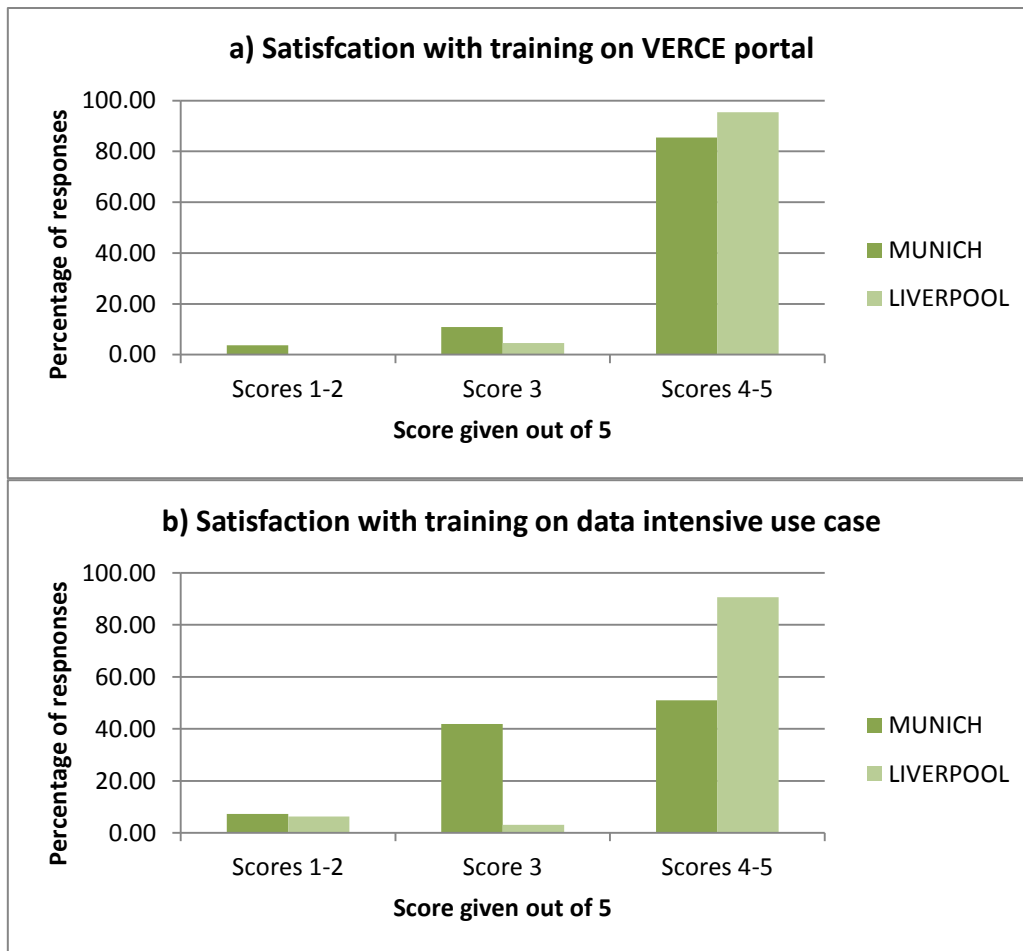**b) Satisfaction with training on data intensive use case**

Figure 2: Summary of the satisfaction with training scores for the face-to-face training events. The overall positive feedback for the VERCE portal training improves slightly, while the satisfaction with the training for the data-intensive use case improves dramatically.

One of the overall strengths of the training events was the cross the variety of speakers from different institutions involved in the VERCE project. In all twelve members of the VERCE community from six instituions were directly involved in the training events, as summarised in table one.

1.1.4 TIDES workshop

The VERCE platform was also showcased at the externally organised TIDES workshop[2] in Bertinoro, Italy. While the time spent on VERCE resources was naturally much less, this did allow the resources VERCE can provide to be displayed to a much wider audience of more than one hundred siesmology PhD students and researchers.

1.2 Documentation

The documentation available for external users falls into three main catagories. The first is online presenations that have been made available to new users of the portal, but also as a resource to those who have attended a VERCE training event an want to remind themselves of the details. These are available on the VERCE website. Second, video demonstrations of using the portal and videoed presentations of the wider resources VERCE provides are also avaiable through the trainng pages of

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[2] http://www.tides-cost.eu/

the VERCE website. The third resource is a user manual document. This is designed to be the first port of call for any new user to the VERCE platform. It also aims to compliment and bring together the other resources on the VERCE training website.

1.2.1   Online presentations

During this deliverable period, 24 presentations have been collected and uploaded to the training pages of the VERCE website. These presentations are listed below:

The presentations from Liverpool summer school event:

- The VERCE Project Introduction (http://verce.eu/Training/UseVERCE/2015-7-VERCE-intro.pdf)
- The VERCE Portal (http://verce.eu/Training/UseVERCE/2015-7-VERCE-portal.pdf)
- The VERCE Portal Practice (http://verce.eu/Training/UseVERCE/2015-7-VERCE-portal-practice.pdf)
- ObsPy Introduction (http://verce.eu/Training/UseVERCE/2015-7-VERCE-ObsPy.pdf)
- The Hex Meshing 101 (http://verce.eu/Training/UseVERCE/2015-7-VERCE-hexmeshing101.pdf)
- dispel4py Introduction (http://verce.eu/Training/UseVERCE/2015-7-VERCE-dispel4py.pdf)
- Basic Dispel4py (http://verce.eu/Training/UseVERCE/2015-7-VERCE-dispel4py-basic.pdf)
- Advanced Dispel4py (http://verce.eu/Training/UseVERCE/2015-7-VERCE-dispel4py-advanced.pdf)
- dispel4py Misfit (http://verce.eu/Training/UseVERCE/2015-7-VERCE-dispel4py-misfit.pdf)
- dispel4py Xcorr (http://verce.eu/Training/UseVERCE/2015-7-VERCE-dispel4py-xcorr.pdf)

The presentations from LRZ training event in Munich:

- The VERCE Training Introduction (http://verce.eu/Training/UseVERCE/2015-3-introduction.pdf)
- dispel4py: Down to the Basics (http://verce.eu/Training/UseVERCE/2015-3-dispel4py_basics.pdf)
- dispel4py in Detail (http://verce.eu/Training/UseVERCE/2015-3-dispel4py_advanced.pdf)
- data-Intensive Methods Using Dispel4py (http://verce.eu/Training/UseVERCE/2015-3-dispel4py.pdf)
- The VERCE Platform and Science Gateway (http://verce.eu/Training/UseVERCE/2015-3-platformandgateway.pdf)
- The VERCE Portal: Example Use Case (http://verce.eu/Training/UseVERCE/2015-3-usecase.pdf)
- HEX Meshing 101 (http://verce.eu/Training/UseVERCE/2015-3-hexmeshing101.pdf)

The presentations from the online training events:

- Data-Intensive Processing with dispel4py (http://verce.eu/Training/UseVERCE/Malcolm-IntroductionWebinar20141015.pdf)
- dispel4py: Down to the Basics (http://verce.eu/Training/UseVERCE/Dispel4Py-Basics.pdf)
- dispel4py in Detail (http://verce.eu/Training/UseVERCE/Dispel4py-Advanced.pdf)
- Installing and Running dispel4py (http://verce.eu/Training/UseVERCE/Dispel4py_Installation.pdf)
- VERCE Portal (http://verce.eu/Training/UseVERCE/Magnoni_Webinar2014.pdf)

- Certificates (http://verce.eu/Training/UseVERCE/CertificateTraining.pdf)
- Compute Resources (http://verce.eu/Training/UseVERCE/VERCEOnlineTraining-AvailableResources.pdf)

1.2.2 Videos

The promotional video produced at the end of the VERCE project is posted on youtube, and so far has received 227 views. There is a direct link to the video on the front page of the VERCE website. The video is designed to outline the purpose of the VERRCE platform, and potentially inspire new users to explore the potential uses of the platform for there research. A link to the promotional video is shown below.

https://www.youtube.com/watch?v=t9Adh1042-M&feature=youtu.be

In addition the presentation slides uploaded from the training events, we also recorded videos of presentations and demonstrations from the online training events. In total ~210 minutes of video resource have been uploaded. A description of the video content follows:

Videos from the data-intensive online-training event (October 2014):

- Welcome and Introduction (15'42) (http://verce.eu/Training/UseVERCE/malcolm-introduction.wmv)
- dispel4py Introduction (17'10) (http://verce.eu/Training/UseVERCE/dispel4py-introduction.wmv)
- dispel4py Installation (5'03) (http://verce.eu/Training/UseVERCE/dispel4py-installation.wmv)
- dispel4py Exercise (14'41) (http://verce.eu/Training/UseVERCE/dispel4py-exercise.wmv)
- dispel4py Functions: chaining, adding and writing PEs (31'49) (http://verce.eu/Training/UseVERCE/dispel4py-functions.wmv)
- dispel4py Functions Exercise (29'14) (http://verce.eu/Training/UseVERCE/dispel4py-functions-exercise.wmv)
- dispel4py Registry and Practise (17'26) (http://verce.eu/Training/UseVERCE/dispel4py-registry.wmv)
- X-correlation Exercise (18'43) (http://verce.eu/Training/UseVERCE/x-correlation-exercise.wmv)
- DI-Enabling Provenance and metadata management (32'37) (http://verce.eu/Training/UseVERCE/di-epmm.wmv)
- Plan for Developing dispel4py (9'33) (http://verce.eu/Training/UseVERCE/dispel4py-plan.wmv)

Videos from the VERCE portal online-training event (July 2014):

- Overview of the platform (11'08) (http://verce.eu/Training/UseVERCE/verce-intro.wmv)
- Forward simulation codes (18'05) (http://verce.eu/Training/UseVERCE/verce-fm-code.wmv)
- Compute resources (10'20) (http://verce.eu/Training/UseVERCE/verce-sources.wmv)
- Certificates (8'00) (http://verce.eu/Training/UseVERCE/verce-certificate.wmv)
- Introduction Portal (5'48) (http://verce.eu/Training/UseVERCE/verce-portal-overview.wmv)
- Setup experiment (25'48) (http://verce.eu/Training/UseVERCE/verce-portal-setup.wmv)
- Access result (19'09) (http://verce.eu/Training/UseVERCE/verce-portal-result.wmv)
- Do your work (13'23) (http://verce.eu/Training/UseVERCE/verce-portal-experi.wmv)

1.2.3 VERCE portal user manual

The user manual is designed to enable a new external user with limited or no previous knowledge of computational seismology, to be able to run waveform simulations from the VERCE platform. The manual also acts as a guide for more advanced users who may wish to submit their own velocity models, and make and submit their own meshes. The manual cannot fully support all the technologies developed under VERCE, so instead acts as a stepping off point for the more detailed resources available on subjects such as producing a mesh for SPECEFEM3D, using ObsPy to process seismic data, using dispel4py to create scalable workflows, and using other Python based tools such as pyflex.

The guide also makes use of the large amount of online presentation materials and video demonstrations that is available through the VERCE website, as detailed above. Sections of the guide often finish with a direct reference and link to parts of these resources that may be useful as a next step in the reader's learning.

The guide covers the steps a user will need to go through to register for and get certificated to use the portal in detail, before going on to describe how to submit a job and view the data output. Details are given on the meshes and models that are currently available through the portal, as well as the formats that models meshes, earthquake and station catalogues must be in in order to be submitted to the platform.

1.2.4 Externally hosted VERCE documentation

During the VERCE project several programming tools for seismological applications such as calculating MISFIT were developed. Many of these tools are implemented in the VERCE portal e.g. using obspy and dispel4py for misfit calculation. The tools are also available as separate programs for more advanced users with more bespoke needs. The documentation for these tools is generally hosted externally on widely used siesmological community forums such as github. The specific documerntations is listed below, and is reffered to inrelavant parts of the user manual.

- ObsPy- https://github.com/obspy/obspy/wiki
- Pylex - http://krischer.github.io/pyflex/
- LASIF - https://github.com/krischer/LASIF
- SEIS-PROV- http://seismicdata.github.io/SEIS-PROV/
- dispel4py - http://www2.epcc.ed.ac.uk/~amrey/VERCE/Dispel4Py/
- Whisper - https://whisper.obs.ujf-grenoble.fr/

2 Summary of Progress throughout the project

The objectives for WP3/NA3 as set out in the proposal and DoW:

Task 1: Provide a training and user documentation work plan.

Task 2: Provide and run annually a comprehensive set of training sessions.

Task 3: Organise and publicise training materials for the scientific users of the e-science environment provided by VERCE.

Task 4: Organise and package the training material as a comprehensive 'toolkit'.

Task 5: Support and promote incentive initiatives to leverage the awareness and knowledge of the earthquake and seismology community as well as the broader Earth science community.

Deliverable title	Description of work done in this reporting period
D-NA3.1	• The development strategy for NA3 was outlined. The strategy consisted of four phases: survey and analyze, review, information to NA4, and input from NA2 and SA3. The cycle of the four phases motivated updates of the documentation and training. • The NA3 survey was created and circulated. The feedback from the VERCE partners showed the preferred training and documentation mediums from high to low is workshop, website, video, helpdesk and mailing list. The result directed NA3 work in this procedures. • This covered the work outlined in NA3 task 1.
D-NA3.2	• Organised first training workshop. The feedback of the workshop was collected and used to improve the later training events. • The documentation was uploaded to the VERCE website (public) and Redmine (internal). • This contributed to the work outlined in task 2.
D-NA3.2.1	• Co-organised the 'all-hands meeting' with SA3. • Based on the feedback from the VERCE partners and previous training event evaluations, updated and published documentation on the VERCE website. • Put the documentation of the all-hands meeting on theVERCE website. • Recorded videos of the all-hands meeting and put these on the VERCE website. • The first VERCE forward-modelling GUI demo was created and published on the VERCE website. • This further contributed to the work outlined in task2: Provide and run annually a comprehensive set of training sessions, and task3: Organised and publicise training materials for the scientific users of the e-science environment provided by VERCE.
D-NA3.2.2	• An online public training event was organised. The event consisted of two sessions: technical aspects of the portal, and hands-on, with participants designing and submitting their own simulation, and viewing the results. • A range of documents were collected from the event and published on VERCE website. The documents covered three parts: an introduction to the VERCE platform, a demo of VERCE portal, and examples of practical usage of the VERCE portal. • The presentations and demonstrations from the workshop were recorded and are available through the VERCE website. • A feedback questionnaire was designed for this workshop, and the feedback has been collected and analysed to inform and improve future VERCE training events. • This work contributed further to task 2, and task 3. The online resources provided also contributed to task 4.
D-NA3.2.3	• Organized the second online public training event, which covered the data intensive resources supported by VERCEm such as dispel4py. • Organised two face-to-face training events, the first at the LRZ in Munich, and the final summer school at the university of Liverpool. Together these events attracted 24 particiapnts from 14 different instiutions.

	• The VERCE platfrom was also presented at the TIDES workshop in June 2014, which had over 100 attendees from various branches of siesmology. • Feedback and evaluation were done. It will be used for the promotion after the VERCE project finished. • 24 presentations were collected and put on VERCE website. • Videos were recorded from the online training events were posted on the VERCE website training pages. The activities described above covered the work outlined in task 2, task 3, and task 4, and task 5.

Table two: *Overview of work carried out in each reporting period*

Objectives set out in the DoW	Description of achievements of objectives
Task 1: Provide a training and user documentation work plan.	This task was completed in deliverable D-NA3.1, on the basis of a survey that was circulated among the members of other VERCE working groups. The survey showed that workshops and videos respectively where agreed to be the most effective training, methods. The work done in the remainder of the project reflects this.
Task 2: Provide and run annually a comprehensive set of training sessions.	The nature of the training has changed through the course of the project.in NA3.2.1 the training consisted of internal VERCE events. The first internal training was held on 3rd-4th September 2012 at Liverpool. The motives of this training were to get the two communities of ICT and seismology nearer, to make experts and researchers of the above two fields better understand each other's needs, and to allow better progress towards project goals. The 'all hands meeting' was also co-organised in this period. In NA3.2.2 the first training sessions available to academics outside the VERCE project were organised. To increase the accessibility of these two training events, they were run as webinars. The feedback and experience gained from these events then fed into the first face-to face training in Munich in March 2015, which in turn lead into the final training at the VEREC summer school in Liverpool, in July 2015.
Task 3: Organise and publicise training materials for the scientific users of the e-science environment provided by VERCE.	The training materials produced throughout the project and training events are available through the website, and were advertised at the various VERCE training events. In addition the VERCE training materials, along with the wider platform were advertised at the externally hosted TIDES workshop in June 2015.
Task 4: Organise and package the training material as a comprehensive 'toolkit'.	The training materials have been posted on the internal and external web resources throughout the project. In D-NA3.2.3 these resources were summarised and brought together in the VERCE manual entitled '*The VERCE portal, a user's guide*', which also acts as a stepping off point for other more advanced resources available through the VERCE website.
Task 5: Support and promote incentive initiatives to leverage the awareness and knowledge of the earthquake seismology community as well as the broader Earth science community.	The training events were the main vehicle for this task. The full potential of the portal and associated resources was made clear to the attendees. The fact that greater resources would be needed for some scientific questions was also pointed out, and attendees were directed to resources such as PRACE for further information

Table three: Overview of activitiy done for each task within NA3, as set out in the DoW.

Glossary

PEB   VERCE Project Executive Board

SC   VERCE Steering Committee

WP3   Work Package 3

NA3   Equivalent to Work Package 3 (WP3)