



Probabilistic TSUnami Hazard MAPS for the NEAM Region (TSUMAPS- NEAM)



Technical Review Meeting Minutes
29 June - 01 July, 2016, Athens, Greece

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1 Agenda

1.1 Generalities

Date and location

29 June - 01 July, 2016; Room Europe Direct, Cultural Center of the Athens Municipality, Akadimias Ave. 50, Athens, Greece.

Organizers

Gerassimos Papadopoulos (papadop@noa.gr); Stefano Lorito (stefano.lorito@ingv.it); Beatriz Brizuela (beatriz.brizuela@ingv.it)

Participants

Project coordinator, Project partners, Scientists in Tasks, Internal and External reviewers.

1.2 Goals of the meeting

This is a “technical review meeting” aimed to addressing the practical plan for the hazard assessment. We thus need to review all the work performed so far; discuss any open question on data and methodology; and reach consensus on how to proceed toward the implementation of the first version of our model. After the meeting, all scientists involved in the hazard assessment should be able to proceed with the completion of the hazard model and the associated products (database and maps).

The meeting is also an opportunity to interact with the panel of invited experts. Part of these experts will take part in the elicitation process, while the others will take part in the internal review. Additional experts will join the review process at a later stage. The mutual understanding between the project partners and external experts is a crucial goal.

To summarize, we will have to do the following:

1. Verify the status of advancement of project Tasks.
2. Discuss and agree on the PTHA approach, methods, data, and models:
 - a. probabilistic model (all event-tree levels and branches as well as probability integration method),
 - b. tsunami generation model, and
 - c. tsunami propagation model, including coastal amplification and dissipation treatment.
3. Illustrate our model to the invited experts (for both the elicitation process and the internal review).
4. Devise a common plan and roadmap for the production of the hazard model, identify possible drawbacks of the work carried out so far and define countermeasures against them as well as against risks that may emerge at a later stage.
5. Define platform and formats of the hazard products for the dissemination activities.
6. Review the status of project management for the first financial and technical reporting.

1.3 Summary

Day 1, Afternoon session

1. Presentations and discussion on Tasks B and C

Day 2, Morning session

1. Initialization of the Elicitation of Experts

Day 2, Afternoon session

1. Presentations and discussion on Tasks B and C

Day 3, Morning session

1. Presentations and discussion on Task D
2. General assembly.
3. Recommendations from the SC.

1.4 Timetable

29 June: Afternoon session

Time	Title	Presenter/Leader
13.00-14.00	Arrivals	
14.00-14.30	Opening and welcoming (Basili, Papadopoulos) Project at a glance; Introduction of invited experts; Adoption of the Agenda (Basili) Nomination of Panels: Internal Review Panel; Panel of Experts (Lorito/Selva)	NOA, INGV
14.30-16.00	Joint sessions on Tasks B and C: <ul style="list-style-type: none"> • Historical review of the PTHA-approaches implemented so far in other projects (Hoechner) • Introduction of TSUMAPS-NEAM approach and status of advancement (Selva/Lorito/Omira) 	INGV, IPMA, GFZ, NOA
16.00-16.30	Coffee break	
16.30-19.30 (max)	Joint sessions on Tasks B and C: <ul style="list-style-type: none"> • Discussion and decisions on the hazard approach (fixing general STEPS and LEVELS) • Discussion about the shared documents, alternative modeling along the Event Tree and other steps, sanity checks, and software 	INGV, IPMA, GFZ, NOA Chairs: Canals, Selva, Omira
20.30	Dinner in Athens city center	

30 June: Morning session

Time	Title	Presenter/Leader
9.00-10.30	Initialization of experts' elicitation	INGV, IPMA
10.30-11.00	Coffee break	

11.00-12.30	Initialization of experts' elicitation (cont'd)	INGV, IPMA
12.30-13.30	Lunch	

30 June: Afternoon session

Time	Title	Presenter/Leader
14.00-15.30	Task B. Discussion and agreement on each specific step regarding: <ul style="list-style-type: none"> • STEP 1 Probabilistic Earthquake Model • STEP 2 Tsunami Generation & Modelling In Deep Water • STEP 3 Shoaling & Inundation 	INGV, IPMA
15.30-16.00	Coffee break	
16.00-17.30	Task B (cont'd): <ul style="list-style-type: none"> • STEP 4 Hazard Aggregation & Uncertainty Quantification • Platform for the hazard model: from sources to hazard curves: "how to" for each single step • Database storage and output formats Task C. Discussion and agreement on each specific step regarding: <ul style="list-style-type: none"> • Structure and roadmap for Documentation • Sanity checks: remaining issues (if needed) 	INGV, IPMA GFZ, NOA
19.30	Dinner in Athens city center	

01 July: Morning session

Time	Title	Presenter/Leader
9.00-10.30	Task D: <ul style="list-style-type: none"> • Status of advancement and roadmap (website, social media, groups, repository, publicity meetings) • Proposal of platform and formats for hazard results; Results display and users' accessibility • Proposal on how to publicize results • Discussion 	METU
10.30-11.00	Coffee break	

11.00-12.30	General assembly: <ul style="list-style-type: none">• Summary of the project management• Reporting to the Commission• Next meetings Recommendations from the SC	INGV
12.30-13.00	Lunch	
13.30 onward	Departures	

2 Minutes

2.1 Generalities

The meeting followed closely the agenda apart from small changes noted below.

The full list of participants is attached at the end of the document. The absence of CNRST (Morocco) representatives was justified few days in advance with the following reason: administrative problems at CNRST.

All the presentations given during the meeting have been collected and will be made available to the Project partners and the Commission through the Project repository.

2.1 Day 1, Afternoon session

2.1.1 Opening and main sessions

Papadopoulos and Basili welcome all the participants.

Basili thanks the participants and organizers and introduces the topics that will be discussed and presented in the meeting. For the benefit of the invited external experts, he presents a quick outlook of the project, explains that TSUMAPS-NEAM is not a research project but a project of applied science for civil protection and humanitarian aid. He also recalls the project funding and introduces the partner institutions of the consortium along with their geographic distribution within the NEAM region. He then summarizes the main objectives of the project, which are: performing a PTHA assessment, finding a new strategy on tsunami risk, carrying out thorough reviews and sanity checks of the results. He also remarks the importance of deliverables, in particular D4, D5, and D6. Finally, he introduces the international guests that have already arrived in the venue and asks them to present themselves and say a few words about their field of expertise:

- a. J. Behrens: University of Hamburg, Germany;
- b. G. Davies: Community Safety Branch, Geoscience Australia, Australia;
- c. J. Polet: California Institute of Technology, USA;
- d. W. Power: GNS Science, New Zealand;
- e. M. Sørensen: University of Bergen, Norway;
- f. C. Ozer: KOERI, Turkey;
- g. H. K. Thio: AECOM, USA;
- h. D. Di Bucci: Italian CPA, Italy;
- i. M. Dolce: Italian CPA, Italy;
- j. C. Meletti: INGV, Italy;
- k. A. Armigliato: University of Bologna, Italy;

Basili illustrates the main reasons for the technical review meeting, and remarks the importance of making decisions on how to carry out the hazard assessment and of ensuring that the whole process is transparent, allows a participatory role of our peers, and carry out an experts' elicitation. Then Basili quickly scrolls the agenda, which is readily adopted. He informs that whoever would like to make a presentation that is not already scheduled or needs a change in the agenda at a later time is welcome and should contact the task leaders in order to make the change.

The opening session carries on with the nomination of panels (Internal Review Panel and Panel of Experts) by Lorito.

Lorito thanks all the partners and especially Thio for having accepted to revise the assessment. He explains that an internal review has been organized within the Google Groups system and how the documents already shared in those groups should be used. He introduces the use of questionnaires to evaluate specific aspects of the hazard assessment (Panel of Experts). Lorito explains the selection procedure to choose who will be requested to fill in the questionnaires. The use of questionnaires is agreed upon by everyone.

2.1.2 Joint sessions on Tasks B and C:

Hoechner presents a historical review of PTHA-approaches implemented so far in other projects/studies. He compiled a list of publications showing how the tsunami hazard analysis has been performed over the time in various regions. He also explains the main aspects tackled in each publication. He asks if someone has suggestions for more publications in case he has skipped something. Explains what will be considered in TSUMAPS-NEAM and what the goals of the project are. Discussion and clarifications follows on some of the illustrated publications.

Selva introduces the TSUMAPS-NEAM approach and the status of advancement. He goes through the following topics:

- Preparing general documents to discuss
 - Overview of the workflow (steps and levels);
 - Details of the levels (analysis of document 1);
 - List of the alternatives to be implemented to complete the action;
 - Sanity checks.
- Plan of what is to be done
 - Going through document 1 and document 2 for deciding what to do for the hazard assessment (logic of the workflow);
 - Analyze details of what has been done and what has to be done (for the second day);
 - Open the documents from the Google Drive and modify them all together as the discussion develops.

The reading of document 1 starts and the discussion develops on the seismic sources with the goal of defining their parameters. The various types of data are briefly illustrated (regionalization, earthquake catalogs, faults, focal mechanisms, etc.) and the methods to use them are discussed.

Step 1: Seismic sources

Goal: defining the parameters of all the “representative” seismic sources and their long-term frequency (mean annual rates)

- Level 0: regionalization, and other seismic/tectonic datasets
- Levels 1 and 2: subdivide seismicity between subduction interface and background and their magnitude-frequency distribution
- Level 3a-3b: variability of seismic sources in the background and interface

A discussion follows. An agreement is reached about dealing with Level 1 and Level 2 in a different way, according to the comments already done in the Google Groups. Other topics for discussion are the use of the term “representative” sources in place of “all possible” sources or other terms. An argument is made on the fact that this definition should convey the message that the sources are a

discretized and simplified representation. The discussion on the term to use, maybe looking for a better one will follow in the Google Groups.

Another topic for discussion is about scenarios and comparison of results with historical data.

After the break, the session resumes with Selva and Babeyko introducing the discussion and decisions on the hazard approach (fixing general STEPS and LEVELS). The following are practical topics for discussion:

1. Seismic sources: define sources in space and time
2. Tsunami generation and propagation in deep water
3. Shore inundation
4. Disaggregation of hazard

All the participants engage in the discussion. Several misunderstandings are clarified. A review of some of the terms used so far seems necessary to avoid reiteration of these misunderstandings. For example, a more general term that is not so linked with subduction zones but more generally with plate boundaries or with faults whose geometry is well known may substitute the term “interface”. The lower threshold for the potential earthquake magnitude of seismic sources should be declared clearly. One open issue that remains is about the possible different recurrence models of bigger faults.

Papadopoulos makes a short presentation showing an updated earthquake catalogue from NOA.

Further discussion on the separation between crustal faults and major plate boundaries in the Mediterranean follows. It is acknowledged that also faults on land will be considered to an extent of interest for tsunami hazard, not just offshore faults. Other topics discussed are the trade-off between knowledge and feasibility of the analysis. Various aspects of how modeling the sources are explored, such as the distribution of different mechanisms for poorly known faults, the slip distribution on bigger faults, the variability of rigidity, and the possibility of exploring various fault geometries for bigger faults. Additional sensitivity analysis may be necessary to address some of these issues.

Presentations resume after the discussion with Lorito illustrating steps 2, 3, and 4.

Step 2: Tsunami generation and modeling in deep water.

- Level 0: Data: crustal model
- Level 1: Coseismic: displacement (Okada)
- Level 2: Tsunami generation model
- Level 3: Propagation in deep water

Discussion follows on why to use the Gaussians method and it is agreed that this method is accurate enough for the problem at hand and allows the work to be done in due time. Differently, the computational cost of simulation may not be feasible.

Step 3: Shoaling and inundation

Lorito explains the goals of this step: simulation of the last phases, stochastic simulation and combination tsunami with tides.

- Level 0: topo-bathymetric datasets
- Level 1: amplification
- Level 2: tidal stage model
- Level 3: uncertainties

Discussion follows on the need for including tides, at least in the Atlantic, rather than using worst-case approach. This topic will need a more in-depth discussion among specialists and an effort should be made to devise a proper way of communicating these terms to the public to avoid confusion.

Step 4: Hazard aggregation and uncertainty quantification

Lorito explains the goals of this step: quantification of the hazard and that disaggregation analysis will be done at the end of the process as it reflects the global picture.

- Level 0: historical tsunamis and paleo tsunamis
- Level 1: combination of steps 1-3
- Level 2: quantification of uncertainties

Discussion follows on what will be the main product of the hazard assessment: hazard curves or inundation maps? It is recalled that the types of products have already been discussed with the end-users and that other products have been requested and proposed by them. Hazard curves are the main deliverables, but several byproducts can be developed from this outcome. Different options (offshore amplitudes, dominant periods) will be considered regarding the metrics adopted to display the hazard results.

A further issue is the comparison with historical data. Does it make sense? Papadopoulos argues that the only way to compare results and data is to choose test sites where there is enough information available. Some test sites are proposed and it is agreed to use the test sites of the ASTARTE project. However, it is remarked that historical and/or paleoseismic data will only be used for comparing results of the computational hazard, not as input data for the hazard calculations.

2.3 Day 2, Morning session

2.3.1 Initialization of experts' elicitation

Selva introduces the elicitation process and explains how and why it is done. Gives an overview of the whole process:

1. TSUMAPS-NEAM uncertainty and management, and the importance of developing our own methodology.
2. Multiple-expert process
An explanation is given about the roles and responsibilities of experts in the project and the importance of external reviewers, as well as why they should have different background. The elicitation process will take place as follows.

- a. Pre-assessment: explanations about what is going to be done in the project (planning), and what will be achieved with the expert elicitation. The formal results are due by September 2016.
Expert elicitation: explanations about how the elicitation will be useful to quantify uncertainties.
Explanations about the several stages that have to be followed to perform the elicitation. Stage 1: preparation. Stage 2: elicitation. Stage 3: post processing.
- b. Explanations about how the models to be used in the assessment will be chosen, following these steps: select the model, implement it, experts' elicitation, obtaining preliminary results, review of the results, adopt final implementation, and agreement on results.
- c. Reporting

Then, explanations are given about the performance-based weighting scheme and what the experts are asked to do in order to fill-in the questionnaire. The participants engage into a discussion about the voting scheme including the voting procedure, reasons for experts to vote themselves, and balancing the weight between various fields of expertise.

3. Overview of formal elicitation

An additional remark is that this elicitation is an analytic hierarchic process: it is done to characterize the problem, decompose it in a hierarchic way and evaluate the various nodes. The elicitation will help give priority to the important aspects of the assessment as well as ranking the alternative models that could be used. The participants engage in a further discussion on the methodology of the elicitation process. Questions and answers regards the results of the voting, remarking that the votes will remain anonymous (blind procedure), the need for including some project partners in the pool of experts to facilitate the interactions among the experts since an early stage.

4. Actual initialization of the elicitation

The elicitation process starts: the questionnaires and the forms for voting are distributed to the selected experts who have accepted to participate in the process, together with written instructions. The process lasts for the rest of the morning session.

2.4 Day 2, Afternoon session

2.4.1 Task B. Discussion and agreement on each specific step:

Selva introduces the discussion for each step of the project and also summarizes the agreements already met on each specific step regarding:

- Step 1 Probabilistic Earthquake Model
Data: regionalization; shows the updating on what was agreed upon on the first day of the meeting.
Catalogues: defines the catalogues that are going to be used
Problems to deal with: completeness, declustering, maximum magnitude
Fault catalogues: EDSF from SHARE as the basic
Past earthquake geometry catalogues: defined
Geodetic data: to be defined

Interface: updating the interfaces that are going to be considered.

A remark is made about that the project has to use data that is already available, due to budget, human resources, and time.

Selva sums up what was decided on day 1 regarding levels 1, 2 and 3, and all participants engage on a discussion about regionalization, faulting (strike-dip-rake), heterogeneous slip, relation between slip and fault area, etc. It is recommended to carry on with the details of this discussion in the Google Groups to allot time to other topics.

Lorito sums up what has been decided so far for Step 2, tsunami generation modeling.

- Step 2: tsunami generation modeling, summing up what has been shared on the documents available on the Google Groups.
Level 0 to 2: all agreed
Level3: regarding tsunami propagation, the issue of considering alternative models is posed and the audience is asked to comment about this.

Aspects arising are the need for rectangular fault interfaces, filtering the outcomes of using uniform slip in shallow depth water close to shore, what to do about tsunami earthquakes, rigidity, scaling laws, etc.

Everyone agrees to continue this discussion about rigidity and connected parameters in a dedicated thread in Google Groups.

All the participants engage into discussing the propagation model. Several aspects are discussed, including the linear combinations, the definition of the term “shallow”, and the reflection at the shoreline. A critical is raised by Behrens who argues that if one sticks to use the -50m isobaths as a reference for the propagation method the interest points at the coast will go on the far side of some coastal places like Venice or the Netherlands. Everyone agrees that those limitations of the methodology should be described.

After the break the session restarts with Lorito, Babeyko, and Omira prompting a discussion regarding the faults in the North Eastern Atlantic region (NEA), then agree on the use of background source. Then the session carries on with the next step to analyze.

- Step 3:
 - Levels 0 and 1

Løvholt explains the amplification methods to be used in the TSUMAPS-NEAM project, and Behrens flags a point on the resolution of the bathymetry that is being used. Løvholt explains that the shoreline can be extrapolated and that in any case an uncertainty factor is going to be introduced on this.

Another problem that is the vertical resolution, and Behrens argues that all the sophisticated analysis may go lost if the topo-bathymetric data is not accurate enough. Hoechner and Behrens

suggest that this problem can be tackled if a proper shoreline is used; then Davies suggests getting an initial estimation of the runup at the shoreline and then applying statistical methods. Løvholt suggests running the model for each transect, and Behrens suggests running 1D simulations using single neighboring profiles instead of profiles spaced every 20 km.

Regarding the communication of results to a non-scientific public, Power suggests that using an appropriate definition of runup to assure that end users get the right message about what they are seeing. Løvholt agrees that a specific term should be chosen when presenting this metric to the end users. Hoechner suggests that the idea of using a mean profile in this step is ok, but that perhaps using clustered profiles could be also useful. Power suggests to choose some scenarios where high-resolution bathymetry is available in order to see if the results differ a lot from those with less detailed bathymetry.

- Level 2 and level 3

Omira explains the proposed methodology to follow for considering tides in the analysis.

- Step 4: Hazard aggregation & uncertainty

A brief discussion is held and then it is decided to postpone decisions on the details after having made clearer what hazard metrics will be used. A dedicated short meeting within a small group of specialists will be organized soon to clarify these points.

Thio gives a short presentation on how the ASCE7 code provides rules to make inundation maps.

Task C. Discussion and agreement on each specific step regarding structure and roadmap for documentation and sanity checks is postponed to the morning session of Day 3.

2.5 Day 3, Morning session

2.5.1 Task D:

Pekcan gives a presentation on the structure and the new features of the website and social media for the project which was the matter of the first deliverable of the project.

A discussion on the contents displayed on the website starts. A suggestion is made to tailor the contents displayed in the website to meet the requirement for the public that is using the website. It is recalled, however, that this is a technical meeting and that the end-users and stakeholders are not present. This topic was initially discussed during the kick off meeting where end users attended. A dedicated meeting may be necessary to discuss this crucial point to find a good way to communicate the results. The privacy issue is discussed with regards to videos posted in the website and especially in the social media. It is agreed that people should be informed beforehand about this possibility and the recording of videos agreed upon individually.

Suggestions and comments are then expressed by several invited experts regarding the transparency of the procedure followed so far, which should be kept as such when communicating the results. Technical documents should thus be made available for users with different backgrounds. One aspect to worry about is to avoid manipulation of published results. In this way, the level of

interactivity with the results granted to the user should be carefully analyzed. A general agreement is reached about restricting the visibility of the results in a first phase, while they are still preliminary. In this phase only partners, reviewers and the Commission should have access to them. Disclosure of the entire content of the hazard results should occur when they are finalized. This is thought to prevent misuse of unfinished products. To streamline the process of uploading the material in the website would require a technical agreement on formats and platforms to use for the presentation of the result.

2.5.2 Reappraisal of Task C:

A presentation about Task C that could not be made in the afternoon of the day before is rescheduled.

Babeyko explains the importance of the sanity checks, and the importance of including several experts on this part of the project. He then goes through all the suggested sanity checks. A discussion follows. Papadopoulos asks if we are focusing in some sanity checks, or all of them. Babeyko and Selva opine that it is something we have to discuss. Basili suggests that we have to set the sanity checks that are mandatory before we show the results to the public. Lorito adds that another sanity check is to establish the test sites that are going to be used to check the results. Lorito, Selva, Papadopoulos, and Canals agree that the places where there are high-resolution data can be the test sites of ASTARTE, i.e. Siracusa, Baleares, Augusta, and Heraklion.

2.5.3 Additional presentations

As agreed in the morning, additional presentations from INM and INGV are added to the agenda.

Evaluation of Seismic Hazard in Tunisia.

Atef presents a summary of a seismic hazard study in Tunisia. The earthquake catalog, zonation, and possibly the faults are seen as potential datasets to fill a gap of data in the northern Africa region. The INM team agreed to make this information available for the project partners.

Preliminary results of the questionnaires.

Selva illustrates the results of the questionnaire, makes positive comments about the distribution of results in terms of precision and accuracy, and explains why the results are encouraging. It is stressed that these results are blind to the audience, i.e. each expert's name is hidden so that, apart from the Technical Integrators, nobody else knows who is who. Then explains the successive phases to complete the elicitation procedure for the pool of experts, which are: first phase, a questionnaire is sent in September; second phase: another questionnaire is sent later to be compiled within some weeks.

As regards the internal reviewers, the following commitments will be: the pre-assessment decision in October 2016, and the establishment of weights on alternative models in January 2017.

2.6 General Assembly

Basili introduces some management updates since the last meeting, as follows. Based on previous questions and answers in other meetings or by email, including inquiries to the Desk Officer, clarifications are given regarding the publications stemming from the projects, the rules that apply for buying equipment and consumables, transfers of budget between different cost categories.

Basili then goes through the timeline of the project and the deadlines for the next progress report, which is due by the end of September at the latest. Deadlines should be rearranged in agreement with deadlines given by the EU. In light of the work done so far, Lorito suggests that some products could be delayed but others could even be done before the scheduled time.

A discussion follows about the need to respect the deadlines in accordance to the grant agreement, but keeping the results private while waiting for the Commission to express its opinion and approval and only after that making the results available to the public. Postponing the deadline for D4 and D5 by two months could give enough time to upload info. Care should be given to the format adopted for the information to be transferred to the website. If a delay of D4 and D5 is deemed necessary, then it should not go beyond the second reporting period. Care should also be taken in moving the deadlines to avoid overloading the ending period of the project.

A general agreement is achieved in keeping the preliminary results private and only available to partners, the Commission, and the external experts. In addition, an extended deadline could be favorably used to allow more time to the experts for reviewing the hazard results.

Some data samples of D4, D5, and D9 are needed for testing. These data should be made available through the website to get a preview restricted to partners.

Preparation of the First Progress Report

Basili reminds all the participants how the progress report should be done, based on Annex V of the Grant Agreement. The Table below summarizes the schedule for preparing the Report. Updates of the T2 forms that are not decided immediately will be decided in a dedicated meeting (teleconference) of the Steering Committee.

It is recalled that it is the responsibility of each partner to fill-in correctly the financial information that will be entered in the Consolidated Cost Statement.

Date	Who	What
10 July	Coordinator	Shares T1 form on Google Drive
31 August	All project partners	Propose amendments to T1 in “suggesting” mode on Google Drive.
1 July - 30 August	Coordinator	Collects contributions from Task Leaders to draft the Report
9 September	All project partners	Propose amendments to the draft Report in “suggesting” mode on Google Drive.
31 August	All project partners	Send the “participant cost statement summary” - form FR03 to the Coordinator.
12 September	Coordinator	Prepares the “consolidated cost statement of the action”.
15 September	SC (teleconf)	Approves First Progress Report, T1-T2 forms, and Financial summary.

20 September	Coordinator	Makes final edits and send the completed report to the Commission
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Next public meetings are confirmed as follows:

Basili talks about the following occasions for gathering to discuss about the project, and he explains that the Steering Committee should discuss what will be presented on the

26-28 September meeting in Bucharest. The Steering Committee should discuss what should be presented.

Presentations for AGU 2016, Fall Meeting are encouraged, deadlines for submitting abstracts is recalled to be the 3rd of August. No need for a Splinter Meeting at AGU is envisaged. Possibly, partners will join the meeting organized by the GTM. For the EGU 2017 the deadline for proposing a session will be in the winter but a session of tsunami science is always organized. It has to be considered that in April 2017 a delegation from the project may need to join the final ASTARTE meeting.

Details of the final meeting for the TSUMAPS-NEAM project will be discussed by email (Google Groups) with INM team in the coming months.

A final recommendation is given to all partners to share the presentations and documents discussed during the meeting, making it clear when some information is not already published, removing any confidential information (if any) before submitting the presentations to avoid infringements of others' rights.

The meeting closes at the scheduled time.

3 List of participants

	Name	Institute
1	Apostolos Agalos	NOA
2	Alberto Armigliato	UNIBO
3	Bouallegue Atef	INM
4	Roberto Basili	INGV
5	Andrey Babeyko	GFZ-Potsdam
6	Jörn Behrens	UHAM
7	Beatriz Brizuela	INGV
8	Nuray Cimen	METU
9	Gareth Davies	GA
10	Daniela Di Bucci	DPC
11	Mauro Dolce	DPC
12	Oueslati Foued	INM
13	Hamdi Hassene	INM
14	Andreas Hoechner	GFZ-Potsdam
15	Sarfraz Iqbal	INGV
16	Niki Liadopoulou	NOA
17	Stefano Lorito	INGV
18	Finn Løvholt	NGI
19	Carlo Meletti	INGV
20	Canals Miquel	UB
21	Tatyana Novikova	NOA
22	Gerassimos Papadopoulos	NOA
23	Onur Pekcan	METU
24	Areti Plessa	NOA
25	Jarmila Polet	CIT
26	William Power	GNS
27	Omira Rachid	IPMA
28	Fabrizio Romano	INGV
29	Jacopo Selva	INGV
30	Mathilde Sørensen	UIB
31	Ceren Ozer Sozdinler	KOERI
32	Hong Kie Thio	AECOM
33	Ahmet Cevdet Yalciner	METU