



## INQUA ANNUAL REPORT FOR 2017 SKILLS FUNDING

**Deadline for receipt of reports by the Secretary-General and the President of the sponsoring Commission: *31<sup>st</sup> January 2018*. Please keep your reports on activities and achievements (5 and 7) brief, because these reports are read by all the members of the Executive. You may attach additional supporting documents (e.g. meeting agenda, news items, copies of publications) if you wish.**

### 1. Skill grant number

SACCOM 1710P

### 2. Title

“Best practices in tephra collection, analysis, and reporting – leading toward better tephra databases”, an INTAV-led workshop held on 19 August 2017 following the IAVCEI conference “Fostering Integrative Studies of Volcanism” Portland, Oregon, USA

### 3. Sponsoring Commission (if relevant)

SACCOM

**4. Leader (name, mailing address, e-mail address):** (All communications will take place by email unless specifically requested otherwise, in which case a fax number should be supplied.):

Prof <b>David J. Lowe</b> (immediate past-president INTAV) (corresponding leader)	University of Waikato, Hamilton, New Zealand	<a href="mailto:david.lowe@waikato.ac.nz">david.lowe@waikato.ac.nz</a>
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The workshop was organized and led by the International Focus group on tephrochronology and Volcanism (INTAV)

Workshop conveners:

- Kristi Wallace, U.S. Geological Survey/Alaska Volcano Observatory, [kwallace@usgs.gov](mailto:kwallace@usgs.gov)
- Steve Kuehn, Concord University, [sckuehn@concord.edu](mailto:sckuehn@concord.edu)
- Marcus Bursik, University of Buffalo, [mib@buffalo.edu](mailto:mib@buffalo.edu)
- Andrei Kurbatov, University of Maine, [akurbatov@maine.edu](mailto:akurbatov@maine.edu)

The grant from INQUA was received by University at Buffalo, who administered its allocation to enable the workshop to take place (see below). Prof Marcus Bursik ([mib@buffalo.edu](mailto:mib@buffalo.edu)) was aided by administrator Barbara Catalono ([bac6@buffalo.edu](mailto:bac6@buffalo.edu)), who has provided an invoice (file 3A) and two Excel files (3B, 3C) with expenditure and other relevant information for this report.



Tephra workshop convenors and facilitators (from left) Kristi Wallace, Steve Kuehn, Andrei Kurbatov, and Marcus Bursik (photo: David Lowe)

**5. Brief summary of Skills Funding activities during reporting year** (Please keep this summary brief. You may attach additional supporting documents, e.g. meeting agenda, news items, copies of publications if you wish) (*maximum one half page*). Other activities for INTAV are given in document 1 IFG report and application.

The skills workshop, held at the Hilton Hotel in Portland, followed the meeting, “Tephra 2014”, in 2014 (INQUA grant, 1307s: Kuehn et al. 2014; Lowe 2015, 2017; Wallace et al. 2015) and was directed specifically towards Objective 5, “Databases”, of the INTAV project “EXTending TephRAS” as a global geoscientific research tool stratigraphically, spatially, analytically, and temporally (EXTRAS). Objective 5 aims to develop regional and ultimately global databases of high-quality mineral, geochemical, and other data (stratigraphic, chronologic, spatial) for tephra and cryptotephra deposits.

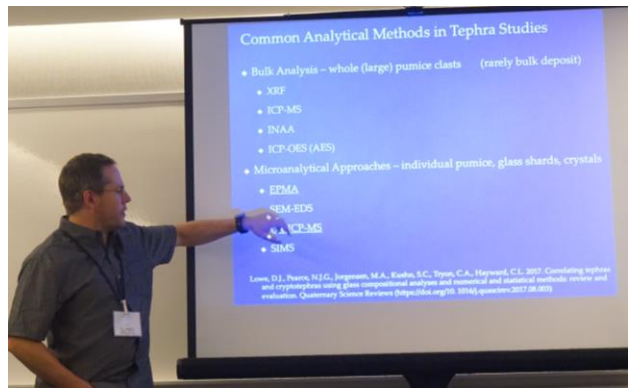
The workshop’s central purpose was to continue efforts to bring disparate tephra researchers together, highlight commonalities, and discuss ways to work together, share data, and list major research goals that a collaborative system may help to address. The one-day workshop thus deliberately included a broad representation of scientists and students who work with tephra. A total of 50 volcanologists, tephrochronologists, archaeologists, geochronologists, paleoclimatologists, paleoecologists, paleolimnologists, glaciologists, petrologists, Quaternary scientists and data managers attended. The restricted size of the venue (unable to be changed because of multiple workshops occurring at the same time in the same hotel) meant that a number of additional participants unfortunately were unable to be accommodated. The workshop ran as a series of invited short talks (around 10 in total) interspersed with discussion sessions throughout the day, the opening talk by David Lowe being an overview entitled “Building a framework for tephra correlation”. The talks are available on the Vhub website (<https://vhub.org/projects/tephra2017/files>). Vhub is an online resource for collaboration in volcanology research (including tephrochronology) and risk mitigation to enable collaboration across geographic and economic boundaries.

### Goals

- 1 Collect and report data that is comparable across disciplines
- 2 Improve or establishing mechanisms for sharing data, data products, analysis tools, code
- 3 Making data more accessible and data workflow more transparent
- 4 Linking tephrostratigraphers with one another (proximal-distal).
- 5 Establish guidelines to make geochemical data potentially usable by all.
- 6 How to allow proximal data and models to inform distal interpretations, and interpretations in other, related domains, e.g., climate change.
- 7 How to allow distal data, e.g., from maps of extent, to inform interpretation of proximal deposits.



(Left) Some of the participants in the workshop



(Right) Steve Kuehn runs through glass-shard analytical protocols.

### *Results*

All workshop participants reconfirmed a strong commitment toward standardization of tephra field/core data collection, processing, storage and distribution. The community feels that such an interdisciplinary effort will help to advance and to solve future emerging research problems in tephra studies. While major discussion was focussed on geochemical analysis, correlation, and data reporting, there was a mutual understanding that other datasets will benefit from improved interdisciplinary compatibility. Best practice checklists and templates for minimum required data are already being developed.

The need for transparent data access across disciplines is a more complicated issue, one that may require a new generation of computer-based research tools. These tools should be integrated into a more complex system that is designed to assist users with solving problems for the particular research area (domain specific), while allowing data streams and tools to be interconnected into a larger framework that is flexible by design to adapt to emerging interdisciplinary problems.

Some specific anticipated products of the workshop include (1) publication of a consensus paper to draw attention to the demand, and to develop a plan for creating comparable datasets across disciplines, (2) continuing to develop multiple open access products, for example, best practice checklists, data collection and processing templates with minimum sets of required data, and (3) collation of already build tools/code/software for data processing. Work on these outputs is currently underway.

One aspect of the meeting that came across very strongly was the great enthusiasm for tephra studies that was evident from the many PhDs and ECRs present. This enthusiasm and growth was extremely pleasing, and meets another object of the EXRAS project, namely to foster and support the development of the next generation of tephrochronologists.

### *Future directions*

- 1 Translate checklists into templates – distribute initially by including as supplements to paper
- 2 Earthchem and Geochron have templates for different communities that can be adapted – we could work with Earthchem to develop a geochemical template that is tephra specific
- 3 Build on our current collection of known databases;
- 4 Begin to collate links to analysis tools into one place; work on motivations for linking proximal and distal datasets.

*References*

Kuehn, S.C., Pouget, S., Wallace, K., Bursik, M. I. 2014. Results of the Tephra 2014 Workshop on Maximizing the Potential of Tephra for Multidisciplinary Science. In AGU Fall Meeting Abstracts (Vol. 1, p. 4758, abstract #V31C-4758). DOI: 10.13140/RG.2.1.2454

Lowe, D.J. 2015. IFG on tephrochronology and volcanism (INTAV) project “Enhancing tephrochronology as a global research tool through improved fingerprinting and correlation techniques and uncertainty modelling (phase II)” (INTREPID Tephra-II: INQUA-1307s): final report. *Quaternary Perspectives* 22 (2), 12-15.

Lowe, D.J. 2017. Report from INTAV: exciting events ahead. *Quaternary Perspectives* 24 (1), 9.

Wallace, K., Bursik, M., and Kuehn, S., 2015, Best-practice checklists for tephra collection, analysis and reporting – a draft consensus from the Tephra 2014 workshop. In AGU Fall Meeting Abstracts (Abstract V51F-3108). DOI: 10.13140/RG.2.2.24067.30248 Link to abstract and poster <http://dx.doi.org/10.13140/RG.2.2.24067.30248>

**5. People involved in the INTAV “Best practice tephra workshop”, Portland, 19 Aug 2017**

Fifty people participated in the workshop, all listed in a separate Excel file submitted with this report that includes names, affiliations, status (“job title”), country: file name: **3B. Workshop\_Best Practices Tephra\_Registrant List\_20170724 (002)** and were from 13 countries as follows including 12% participation from low GDP countries (highlighted):

USA 30%, UK 20%, New Zealand 12%, Australia 4%, Iceland 6%, Singapore 2%, Canada 6%, Germany 4%, S Korea 1%, **Mexico 6%, Philippines 4%**, Japan 2%, **Costa Rica 2%**.

Name	Institute	Country	Role	Status (PhD, ECR, DCR, SS)
See attached Excel file for this specific information: “3B. Workshop_Best Practices Tephra_Registrant List_20170724 (002)”. This Excel file forms an integral part of this report.				

**6. List of publications during reporting year**

None yet from the workshop other than an online preliminary report on the Vhub website.

**7. Paragraph describing your aims and activities, to be included in *Quaternary Perspectives* (photos may be sent directly to the QP editor). Will send this note and photo to editors this week.**

*Stratigraphy and Chronology section*



**International focus group on tephrochronology and volcanism (INTAV)**

The International Focus group on tephrochronology and Volcanism (INTAV) ran a workshop entitled “Best practices in tephra collection, analysis, and reporting – leading toward better tephra databases”, on 19 August, 2017, in Portland, Oregon, USA. The one-day workshop followed the IAVCEI conference “Fostering Integrative Studies of Volcanism” held in the same city the previous week.

The workshop, held at the Hilton Hotel in Portland, was directed towards Objective 5, “Databases”, of the INTAV project “**EXTending TephRAS as a global geoscientific research tool stratigraphically, spatially, analytically, and temporally**” (EXTRAS). Objective 5 aims to develop regional and ultimately global databases of high-quality mineral, geochemical, and other data (stratigraphic, chronologic, spatial) for tephra and cryptotephra deposits.

The workshop conveners were:

- Kristi Wallace, U.S. Geological Survey/Alaska Volcano Observatory, [kwallace@usgs.gov](mailto:kwallace@usgs.gov)
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Some participants engrossed in the tephra workshop. *Photo: David Lowe*

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For further information, please contact any of the convenors above, or David Lowe (david.lowe@waikato.ac.nz).

## 6. Breakdown of use of the INQUA funding

You will need to supply electronic (scanned) copies of receipts for your expenditures; we request that you (or your organization) keep the original receipts in case of any subsequent audit of INQUA. Please list the item paid for in the second column, and give a brief description (e.g. taxi receipt, room booking fee). Please make sure that the scanned receipt is marked with the appropriate number for this item. Please give the cost in the original currency (i.e. to match the receipts you are providing) and then the equivalent sum in Euros (because your budget from INQUA was awarded in Euros). If the item involves funding travel or subsistence for a specific person, they should be named in the second column. Please indicate their status (PhD, ECR, DCR) so that it is easy to check that the expenditure conforms to INQUA policy.

The grant (SACCOM 1710P) from INQUA, **5000 €**, was converted to **\$5395.50 USD on 19 June 2017**, by staff (led by Prof Marcus Busick) of the University at Buffalo, New York, which received and administered the grant. It was largely used to support 26 early career researchers (ECRs) including 14 PhD students, 7 postdoctoral fellows, and 5 lab assistants/research assistants, together making up just over half (52%) of all the participants, in (1) registration costs and (2) as travel grants for 7 ECRs, as summarised below.

### *(1) Registration costs for workshop*

For simplicity, these 26 and the remaining (24) participants (not ECRs) were subsidised in their registration fees by \$35 USD (32.43 €) per person. Total = \$1750 USD (~1621.72 €). The invoice from IAVCEI to University at Buffalo for the registration fees for 50 participants is attached to this report (3A. Invoice - 20170713 - University of Buffalo - Workshop Registration Fees - \$1750 USD).



PhD students and ECRs funded to enable attendance at the workshop. Seven of these grateful people were provided with travel grants of \$500 USD each. *Photo: David Lowe.*

*(2) Travel grants to attend workshop*

Six PhD students (two from a low GDP country, three female), and one postdoc, were granted \$500USD (~463.35 €) each as travel grants:

- A. Lorenzo Moreno PhD student (female, Mexico)
- B. Todde PhD student (female, New Zealand)
- D. McLean PhD student (female, UK)
- I. Sune Puchol PhD student (Mexico)
- J. Moles PhD student (UK)
- T. Aubry PhD student (Canada)
- S. Biasse Postdoc (USA)

Total = \$3500 USD (~3243.44 €). Details are given in the Excel file **3B. Tephra\_SACCOM1710P\_Portland2017** attached to this report.

No	Item	Cost (in original currency USD)	Cost (in euros)	Person involved (status: PhD, ECR, DCR)
<b>Allocations of funds (administered by the University at Buffalo) are summarized in the Excel file: "3C. Tephra_SACCOM1710P_Portland2017". This Excel file forms an integral part of this report.</b>				
1.	Registration (\$35USD each)	\$1750	~1621.72 €	50 registrants (14 PhD, 12 ECR, 6 DCRs some also PhDs)
2.	Travel grants(\$500USD each)	\$3500	~3243.44 €	7 registrants (6 PhD, 1 ECR, 2 DCRs also PhD students)
3.	Miscellaneous support for University of Buffalo student	\$145.50	~134.83 €	1 PhD student
	<b>Totals</b>	<b>\$5395.50</b>	<b>5000 €</b>	

**Money awarded in reporting year: 5000 €**

**Total spent in reporting year: 5000 €**

**Unspent money in reporting year: 0**



**Signed** (leader):

Prof David J. Lowe *PhD FRSNZ FNZSSS Hon Life Fellow INQUA*  
(on behalf of INTAV and workshop convenors)

**Date:** 31 January 2018