



IsoScapes 2011: Recap

IsoMAP was a supporter and participant in the recent IsoScapes 2011 meeting (held Sept. 25-27 at Purdue University). As far as

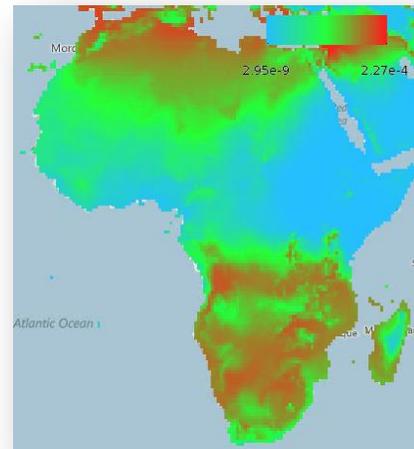
IsoScapes 2011

we can tell the meeting was a great success, drawing a diverse group of 60 enthusiastic participants from the USA, Canada, UK, Germany, Spain, South Africa, New Zealand, and Australia. Several concrete products are already available or in the works: 1) participant feedback regarding the role isoscapes play in their research and how cyberinfrastructure can be improved to better facilitate this work now and in the future; 2) an annotated inventory of web-based resources for spatial data identification, acquisition and analysis; and 3) a special issue of the ESA journal *Ecosphere* spearheaded by Jason West. IsoMAP was featured in 5 different poster and oral presentations at the meeting, and new documentation, including a PowerPoint summarizing key technical and scientific features of the current version of the IsoMAP web resource, was prepared for the meeting. You can find this document and other products from IsoScapes 2011 in the “Products” section of the meeting website: <http://isoscapes2011.org>.

New IsoMAP Release: Geographic Assignment

We are happy to announce the release of the first of a suite of hierarchical modeling tools that we hope will greatly increase the scope of IsoMAP’s capabilities in the coming years. The geographic assignment tool builds on precipitation isotope products developed within IsoMAP, allowing users to transform a prediction map (and the associated prediction uncertainty) into statistical estimates of the relative likelihood of a sample having originated at any given point on the map. Intended applications include migration research, wildlife and criminal forensics, and product authentication.

The structure of the assignment tool is simple: the user selects an existing precipitation isotope map product from the IsoMAP database, adjusts the spatial extent for the assignment, if desired, and enters the isotopic value(s) and associated uncertainty for his/her sample(s). In order to promote flexibility, we leave it to the user to convert measured values for any non-water samples (e.g., feathers, beer, teeth) into estimated environmental water isotope ratio values using appropriate fractionation factors or empirical relationships. Uncertainty in these transformations should also be incorporated in the estimated



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uncertainty of the sample value entered. Data for individual samples can be entered directly in a web form. Within the next few weeks, we will release a 'batch assignment' module where values for multiple samples can be uploaded in a tab-delimited text file to map their joint probability surface. IsoMAP calculates relative likelihood values for all grid cells in the specified map domain using the formulation of Kennedy et al. (2011). The resulting maps are available for display or download through the standard IsoMAP interfaces.

IsoAPP 1.0



The initial version of IsoAPP, the new iPhone application for water isotope prediction, was rolled out to the iTunes App Store in late September. In its current form, IsoAPP is an alternative interface to the Online Isotopes in Precipitation Calculator (OIPC) at WaterIsotopes.org. IsoAPP grabs your current location information from your phone's GPS and allows you to submit these coordinates to the OIPC and receive estimates of mean annual precipitation isotope ratios for your current location. What better way to impress your friends at cocktail parties? Or geo-reference your field samples, in parallel with sample-relevant predictions? Results are stored in a file on your iPhone and the location of stored estimates can be viewed on a Google map. Further development of IsoAPP is a 'hobby' at this point, but there are a number of improvements and exciting add-ons that we are hoping to build over time. If you are iOS savvy and interested in contributing let us know!

IsoMAP User Experience

Between now and the year's end we will be working to enhance and improve the usability of IsoMAP. Some of these changes have already happened or are underway. Those of you who are actively using the site may have noticed the recent order-of-magnitude improvement in the speed of database queries used in the precipitation modeling and mapping workflows. In addition to increasing efficiency, this fix should also resolve database issues we've had previously during periods of high user load, making IsoMAP a robust resource for use in the classroom and other group training and outreach environments.

Other changes you can expect to see in the near future include:

- More 'tool tips' and clickable explanations of terminology
- More consistent styling and predictable behavior of the workflows controls
- A point-query tool allowing you to extract pixel values from the map display
- Reduced 'file clutter' in the downloadable results archives
- New 'readme' files documenting the content of the results archives

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Citing IsoMAP

Although IsoMAP will always be our baby – and it is hard for us to let go – we realize that the system now includes enough functionality that some users may be ready to use IsoMAP-derived information in their own published work. IsoMAP helps you analyze data and make derived data products, and our goal is to make this process as easy and robust as possible. These resulting products are the synthesis of data, methods, and your decisions. In order to ensure the responsible use and traceability of IsoMAP-derived products, we ask that you adhere to the following guidelines for citing work conducted in IsoMAP.

- Any IsoMAP job used in published work should also be ‘published’ within the IsoMAP system, making it discoverable and usable by other IsoMAP users. You can publish your jobs at any point using the links in the “My Jobs” page.
- The IsoMAP job key provides a unique ID for every analysis conducted within the system, and should be used to identify specific data products used in your work. For work using only one or a very small number of products, the appropriate citation format (where XXXX is the job key) is:

Product creator’s name (year created) IsoMAP job XXXX, Isoscapes Modeling, Analysis and Prediction (version 1.0). The IsoMAP Project. <http://isomap.org>.

- In cases where you have used a large number of data products, please use the generic IsoMAP citation below and include a list of job keys in your paper’s supplemental information.

Bowen G. J., West J.B., Miller C. C., Zhao L. and Zhang T. (current year) IsoMAP: Isoscapes Modeling, Analysis and Prediction (version 1.0). The IsoMAP Project. <http://isomap.org>.

- In order to ensure proper attribution of the data underlying your analysis, we ask that you also include citations to the primary data sources used in your project. We intend to develop a process for auto-generating specific data source citations associated with each IsoMAP job, but in the mean time we ask that you refer to the general guidelines found [here](#).

Free Stuff!!!

Like flash storage? Ever go shopping? The next 5 IsoMAP users who complete our quick 5-question survey providing feedback about your experience will receive a super-cool 2GB IsoMAP flash drive and eco-friendly shopping tote! Simply access the survey here (<http://bit.ly/ekZeQS>) and provide your name and shipping address in the ‘other comments’ box. Not an IsoMAP user? Register (<http://isomap.org>) and take a few minutes to explore, then give us your first impression!



- IsoMAP data products are the intellectual property of their creators, who retain copyright to these products. By publishing their data products within the IsoMAP system, the creator grants any IsoMAP user the non-exclusive right to download, reproduce, or reuse the product, in part or in whole, in original or modified form, for non-commercial purposes. In so using data products obtained from IsoMAP, the user agrees to abide by the above guidelines on attribution and citation of these products and to refrain from re-distributing the data products.

Recent and Upcoming Presentations and Publications

Upcoming presentations at the fall 2011 AGU meeting:

Liu Z., Bowen G. J. and Welker J. M. Winter precipitation isotope gradients ($\delta^{18}\text{O}$) of the contiguous USA and their relationship to the Pacific/North American (PNA) pattern. PP24B-08 (Tues., 5:45, Room 2005).

Mittal S., West J. B., Bowen G. J., Kalangi A., Lee H. J., Miller C. C., Zhang T. and Zhao L. Web-based leaf water isoscapes in IsoMAP using raster modeling. IN33B-1469 (Wed., 1:40 – 6:00, Halls A-C).

Bowen G. J., Hobson K. A., Wassenaar L. I. and Zhang T. Spatiotemporal isoscapes for migration research. B52A-06 (Fri., 11:25, Room 309).



New papers:

Bowen G. J., Kennedy C. D., Liu Z. and Stalker J. (2011) Water balance model for mean annual hydrogen and oxygen isotope distributions in surface waters of the contiguous USA. *Journal of Geophysical Research*, 116, G04011, doi:[10.1029/2010JG001581](https://doi.org/10.1029/2010JG001581).

Kennedy C. D., Bowen G. J. and Ehleringer J. R. (2011) Temporal variation of oxygen isotope ratios ($\delta^{18}\text{O}$) in drinking water: Implications for specifying location of origin with human scalp hair. *Forensic Science International*, 208, 156-166. doi:[10.1016/j.forsciint.2010.11.021](https://doi.org/10.1016/j.forsciint.2010.11.021).

Lee H., Zhao L., Bowen G. J., Miller C. C., Kalangi A., Zhang T. and West J. B. (2011) Enabling online geospatial isotopic model development and analysis. *Proceedings of the 2011 TeraGrid Conference: Extreme Digital Discovery*, 1-8. doi:[10.1145/2016741.2016783](https://doi.org/10.1145/2016741.2016783).

Liu Z., Kennedy C. D. and Bowen G. J. (2011) Pacific/North American teleconnection controls on precipitation isotope ratios across the contiguous United States. *Earth and Planetary Science Letters*, 310, 319-326. doi:[10.1016/j.epsl.2011.08.037](https://doi.org/10.1016/j.epsl.2011.08.037).

