

## Postdoc Position: Identifying Controls on Critical Minerals in Massachusetts Pegmatites

### Project Description

September 9, 2025

Funded by [EarthMRI](#) and working in close collaboration with the USGS, the Massachusetts Geological Survey seeks a broadly trained hard rock geochemist to lead fieldwork, petrographic analysis, and conceptual model development to evaluate the genetic processes that lead to occurrences of complex pegmatites in Massachusetts. The region of interest in north central Massachusetts is in the footprint of the [Acadian Altiplano](#), an apparent locus of critical mineral-bearing pegmatites, and contains several historic mines where rare earth metal-bearing minerals have historically been extracted.

The main goal of this project is to develop a detailed map, geochemical description, and process-based understanding of pegmatites in central Massachusetts (Sterling and Fitchburg quadrangles) that have historically yielded lithium and other rare metal-bearing critical minerals. Project deliverables will offer insights into the geochemical, petrologic, and tectonic (i.e. earth history) controls on where lithium-bearing (as well as other critical minerals) pegmatites occur in close alignment with State and Earth MRI goals. Furthermore, the focus area overlaps with a planned EarthMRI airborne geophysics survey that is being flown at present during summer 2025, which will allow for extrapolation beyond areas that are investigated directly in the field. These surveys can identify hidden structures and geologic elements that may be important to understanding the occurrence of these pegmatites (e.g. plutonic body at depth) or even help identify more of them.

Our main project objectives are to answer the following driving questions (1) What structural, petrologic, tectonic, chronological, or location differences might explain why some pegmatites in this region are rich in rare elements, while others are compositionally simple (i.e. quartz feldspar mica) pegmatites? (2) What are the tectonic controls on the present-day location of complex pegmatites, and what is their relationship to past tectonic events in New England?

### Essential skills and aptitudes:

- Fieldwork and fieldwork planning
- Whole rock geochemical analyses and interpretation
- Petrographic analysis of thin sections via SEM and microprobe
- Excellent command of hard rock geochemistry and related processes
- Excellent written and graphical (figures, maps, etc) communication skills
- US driver's license

### Preferred Skills and aptitudes:

- Bringing geologic maps to publication
- Interest in teaching and mentoring
- Petrochronology (e.g. monazite-xenotime) and U-Pb geochronology

**Responsibilities:**

- Plan and execute all fieldwork and sample collection
- Produce updated 1:24,000 scale geologic maps of the Fitchburg and Sterling quadrangles showing the locations of prominent pegmatite districts along with accompanying geochemical and/or geochronologic data.
- Characterize whole rock composition and geochronology of simple and complex pegmatites in the region and provide a conceptual model describing the controls on composition
- Publish a report or manuscript detailing observations, analyses, and a conceptual model of fluid emplacement within Acadian Altiplano pegmatites.

**Details:**

- \$63-\$66k/yr (depending on experience) plus benefits and annual raises. Full time equivalent.
- Start date: Feb 1, 2026 (some flexibility)
- Duration: 2 years (possibly longer pending additional funding)
- This position requires regular fieldwork in central Massachusetts
- Project PI is Massachusetts State Geologist and UMass faculty member, Brian Yellen. Co-investigators and collaborators include [Michael Williams](#) and Steve Mabee at UMass Amherst and [Chris Holm-Denoma](#) at USGS in Denver.

**[APPLY HERE](#)** - Google Form to upload a CV and cover letter; also list three references on the form. (If the link does not work: <https://forms.gle/iyQbJHX5gUMwRhGj8>. Google account is required to upload forms. Please reach out to [byellen@umass.edu](mailto:byellen@umass.edu) if this is a problem.

Your cover letter should include: (1) Why the position appeals to you; (2) Your relevant experience and how it fits with listed skills and aptitudes; (3) How this position fits with your career goals.

Priority will be given to applications received before October 10, 2025.

Questions: please email Brian Yellen, [byellen@umass.edu](mailto:byellen@umass.edu)

\*Note if viewing a pdf version - updated version here, [google doc located at this link](#).

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