CRESCENT SEED GRANT PROGRAM 2026-2027
Innovative science for a resilient society
Request for Proposals

In 2023, the National Science Foundation awarded $15 million dollars to establish the Cascadia Region Earthquake Science Center (CRESCENT). CRESCENT is the nation's first subduction zone earthquake hazards center and serves as a nexus for basic and applied research with three overarching goals:

- To develop a better foundational understanding of Cascadia Subduction Zone earthquakes and their associated hazards;
- To promote access to careers in the geosciences and train the next generation of geoscientists from a diversity of backgrounds;
- To provide a systematic approach to collaboration between researchers in academia and those in agencies or organizations that have mandates to produce hazard information that stakeholders, practitioners, and the public at large can trust and use.

CRESCENT represents a grassroots effort on the part of scientists, educators, and community members to organize efforts to increase the strength and resilience of our lifelines, of our infrastructure, and our communities.

SEED GRANT PROGRAM GOALS

The CRESCENT Seed Grant Program has the dual goals of broadening community participation and increasing the breadth of scientific investigations related to the center's scientific goals.

Achieving these goals relies, in part, on community participation in addressing key challenges identified through three major pillars: i) Science (S): Understanding earthquakes and their hazards, ii) Geoscience Education and Inclusion (GEI): Expanding access to careers in geosciences, and iii) Partnerships and Applications (PA): Creating a collaborative pipeline from science to society.

Each year, the members of each CRESCENT Pillar, Working Group, and Special Interest Group identify their current research needs and provide priority topics for the seed grant program. ***Proposals that respond to one or more of the priorities within or across pillars, as outlined below, will be considered for funding. We also encourage science proposals co-designed with partner groups.***

Science Pillar Priorities:
CRESCENTs science program focuses broadly on developing a better understanding of the earthquake-related hazards of the Cascadia Subduction Zone region, including the plate boundary megathrust and upper and lower plate fault systems, through focused collaborations between teams of scientists organized into five Working Groups: Dynamic Rupture, Earthquake Cycle, and Tsunamis (**DET**), Community Fault Model (**CFM**), Cascadia Paleoseismology (**CPAL**), Coupling, Seismicity, and Slow Slip (**C3S**), and Community Velocity Model (**CVM**). CRESCENT also includes several Special Interest Groups (SIGs) on Ground Motion Modeling

(**GM**), Cascadia Fluids Model (**Fluids**), Offshore Observations (**OO**), Ground Failure (**GF**) and Tsunami Sources for Hazard Assessment (**TSHA**).

Each of these Working Groups and Special Interest Groups has identified specific priority areas for this round of Seed Grant funding, enumerated below. Overarching themes include the development of essential new understanding of the hazards presented by multi-fault systems and their attendant complexity; of the interaction among multiple hazards such as the generation and propagation of tsunamis, landslides and other ground motions; of the elastic and geodetic structure and motions of the region that drive earthquake potential and seismic wave propagation; and of innovative modeling approaches, data assimilation and visualization, or research software infrastructure. The CRESCENT strategic plan and website provide context and further information on the existing activities of each of these groups and how they may be complemented by proposals that address these priorities.

Science Working Group Priorities:
Dynamic Rupture, Earthquake Cycle, and Tsunamis (**DET**) Priorities:

- DET1: Tsunami models for Cascadia that account for often ignored but potentially important complexities such as multi-fault ruptures, splay faults, dynamic effects, distributed inelastic yielding of sediments, seismic, acoustic and gravity wave interactions, etc. Of special interest are models or approaches that explore inundation, sediment transport, debris modeling, and which ideally connect with paleoseismic constraints.
- DET2: Workflows that link fully coupled dynamic rupture simulations (which include tsunami generation and the very early stages of propagation, like the TTPV benchmarks) to more efficient depth-integrated tsunami-only models, including dispersive Boussinesq models.
- DET3: Modeling approaches that extend dynamic rupture models for Cascadia megathrust events to better characterize ground motions, especially approaches that capture realistic variability.
- DET4: Models exploring the relation between megathrust rupture extent and shallow deformation, and along-strike and along-dip variations in geology, rheology, splay-faulting and tectonics.
- DET5: Dynamic rupture and/or earthquake cycle models exploring the down-dip extent of slip in megathrust ruptures and interaction with the region of slow slip and tremor and implications for seismic hazard.
- DET6: Code verification in community benchmarks towards validation of Cascadia dynamic rupture simulations.

Community Fault Model (**CFM**) Priorities:

- CFM1: Develop new data and/or analytical methods that constrain on- or off-shore crustal fault activity or shoreline-crossing structures in space and time (especially northern and southern Cascadia). Example proposals might include geomorphic studies of tectonic slip rate and paleoseismology of earthquakes, and could utilize existing lidar, remote sensing, or seismic datasets. Studies that combine the geologic record on and offshore are encouraged.

- CFM2: Address gaps in existing on- and off-shore fault and fold databases and slab models for incorporation into a CFM (especially for northern and southern Cascadia). Example proposals might include: new fault studies on structures that are not included in the NSHM 2023 and CFM v0.1; new fault studies on structures included in the NSHM 2023 and CFM v0.1 that predate lidar acquisitions; studies of offshore faults and folds south of the CASIE21 survey extent.
- CFM3: Improving 3D models for the subducting plate. Examples include 1) Publishing data sets to incorporate into a revised slab model from new studies or refinement of older studies (especially northern and southern extents of the margin). 2) Developing new 3D models of the subducting plate that incorporate new and updated datasets. 3) Developing new or modifying existing software tools for building slab models that users could continue to use to generate updated models. We encourage building on existing tools (e.g., Slab2), including collaboration with existing research teams.

Cascadia Paleoseismology (**CPAL**) Priorities:

- CPAL1: Crustal fault behavior and integration with community fault models Investigations that improve constraints on the geometry, slip rates, recurrence intervals, and recency of activity of upper plate crustal faults in the Cascadia forearc and backarc are encouraged. Priority will be given to studies that generate geological and temporal constraints intended for incorporation into the Community Fault Model (CFM) and related hazard frameworks. Example proposals might include paleoseismic or tectonic geomorphic investigations of previously unrecognized structures, and studies that integrate onshore and offshore records to refine fault geometry, segmentation, or slip histories.
- CPAL2: Geologic records of tsunami inundation records and integration with DET modeling Investigations that reconstruct tsunami inundation extent, flow characteristics, and spatial variability at locations critical to hazard evaluation are encouraged, particularly near at-risk or critical infrastructure and communities. Priority will be given to studies that provide new geological constraints on inundation limits, sediment transport, or site-specific vulnerability. Example proposals might include stratigraphic, sedimentological, microfossil, or geochemical analyses that can be used to evaluate, validate, or refine tsunami simulations and scenarios developed within the DET working group.
- CPAL3: Geologic records of megathrust rupture characteristics and integration with earthquake cycle and rupture models Investigations that improve constraints on Cascadia megathrust rupture behavior and variability through time are encouraged. Priority topics include studies of along-strike and down-dip rupture extent, spatial patterns of coseismic and interseismic deformation rate and magnitude, and event-to-event variability, as well as efforts to improve event chronologies and quantitative estimates of coseismic subsidence or uplift, particularly for pre-1700 CE earthquakes. Example proposals might integrate stratigraphic, geomorphic, or high-resolution geochronologic data with quantitative earthquake cycle, dynamic rupture, or hazard modeling approaches.

Coupling, Seismicity, and Slow Slip (**C3S**) Priorities:

- C3S1: Coupling: Investigations of coupling on the megathrust and the role of viscoelastic deformation in the Cascadia earthquake cycle.

- C3S2: Seismicity: Novel approaches for generating more complete earthquake catalogs and source parameters. We encourage proposals that extend seismicity catalogs into Canada and include source characteristics (i.e., focal mechanisms, magnitudes, stress drops, etc.)
- C3S3: Geodetic Deformation: Characterization of slow slip over all temporal and spatial scales and explorations of the mechanisms responsible. Use of multiple geodetic data types for tracking of interseismic and transient deformation.

Community Velocity Model (**CVM**) Priorities:

- CVM1: Projects – Projects that image or compile near-surface, basin-scale and/or upper crustal (<10 km) structures, specifically in poorly characterized regions and population centers, to improve ground motion and seismic event source parameter estimates.
- CVM2: Tools – Development of algorithms that map between uncertainties in seismic parameters and simulations/ground motion models.
- CVM3: Beyond Elasticity – Approaches that quantify and/or model anelastic properties (e.g., attenuation, nonlinearity, site effects, etc.) in critical parts of or across the CRESCENT CVM footprint with the aim of improving ground motion modeling.

Science Special Interest Group Priorities:

Ground Motion Model (GMM) Priorities:

- GM1: Proposals to develop projects, meetings, pilots for larger proposals, etc. that promote collaborations and organize researchers from the CRESCENT Ground-Motion Modeling SIG (SIG2) and associated fields and disciplines, towards translating research into application in the short- or long-term. Example studies may focus on but not be limited to seismic velocity model validation and database development that contribute to NSHM priorities, understanding how subduction zone structure and geometry may impact regional ground motions, and ground motion comparisons between the CSZ, and other global regions.
- GM2: Development of computational and data infrastructure for the scientific community (e.g., ready-to-use containers, notebooks, and code for physics-based wave propagation modeling and ground motion simulations, generation or formatting of databases of empirical or simulation data with specific uses towards fully non-ergodic ground motion modeling and hazard assessment, etc.)

Cascadia Fluids Model (Fluids) Priorities:

- Fluids1: Development of models of temperature distribution in Cascadia, to be used for (i) calculating dehydration reaction fluid release and determining (ii) friction law parameters and (iii) effective viscosity for viscous flow laws (to be used in viscoelastic coupling inversions and viscoelastic earthquake cycle modeling). Models can be multiple 2D vertical cross-sections or 3D models.
- Fluids2: Development of information/products aiming to quantify material and fluid inputs at the trench (to be used for forward modelling of evolution of this material using thermal model).

- Fluids3: Geological, experimental, or modelling studies of fluid environment/processes applicable to Cascadia megathrust at a range of depths

Offshore Observations (OO) Priorities:

- OO1: Preparatory work for a major proposal to study an aspect of the structure or deformation of the Cascadia Subduction Zone that goes beyond what might reasonably be done without support. For example, demonstrating a new approach with real or synthetic dataset or conducting sensitivity tests to evaluate the number and distribution of offshore stations/observations that are needed to test a hypothesis.
- OO2: Studies that seek to reanalyze or integrate existing offshore data sets that bear on our understanding the Cascadia Subduction Zone. For example, relocating offshore earthquakes relative to new images of the plate boundary or incorporating physical oceanographic data and models into the analysis of GNSS-acoustic or seafloor pressure geodetic data.
- OO3: Studies that explore novel approaches that span the shoreline that are presently not in the crosshairs of either the terrestrial or ocean communities. Examples might include mapping topography/bathymetry across the coastline and sensing tsunamis from the coast (e.g., radar or infrasound).

Ground Failure (GF) Priorities:

- GF1: Analysis or creation of databases of shaking proxies, such as landslides and liquefaction deposits. Example proxies could be from laboratory, or terrestrial, lacustrine, or marine environments and use observations from cores, trenches, and geomorphic characteristics. We are interested in enabling weighting structure and comparison to non-Cascadia Subduction Zone controls (e.g. rainstorms, crustal events) and null events to potentially facilitate more in-depth, multidisciplinary analysis to constrain Cascadia shaking.
- GF2: Analysis of landscape/site response to historical and modern earthquakes (e.g. Nisqually, Scotts Mills, Klamath Falls earthquakes, etc.) – we invite proposals that address what we can learn from comparisons between observations of the responses to shaking.
- GF3: Leveraging CRESCENT or other Cascadia products to better constrain potential ground failure hazards, ground failure hazard chains or create refined models of ground failure hazard from a Cascadia Subduction Zone Event.

Tsunami Sources for Hazard Assessment (TSHA) Priorities:

- TSHA1: Studies that improve usability and accessibility to existing CSZ tsunami source scenario sets (e.g. Powell Center and CoPes Hub) by developing documentation, metadata standards, and user-friendly workflows for tsunami scientists and stakeholders.
- TSHA2: Studies that explore novel probabilistic Tsunami Hazard Assessment (PTHA) and other hazard/risk/loss analysis approaches incorporating compounding and cascading processes (e.g. tides, coastal sea level rise, other long term ground level changes, sediment transport, etc.).
- TSHA3: Studies that explore novel mathematical-physical approaches that quantify the uncertainty of tsunami hazard/risk/loss caused from the uncertainty of tsunami source and propagation.

- TSHA4: Studies that incorporate recent paleoseismology research and modeling in Cascadia into sources that can be used in tsunami hazard assessment products.

Partnerships and Applications Priorities:
The P&A pillar is interested in proposals that address the three core priorities listed below and contribute to CRESCENT's broad mission to increase the seismic resilience of the Cascadia region. Projects should encourage collaborations and partnerships between community entities, educational institutions, agencies, existing research hubs, public/private sector organizations, and CRESCENT. Projects may include, but are not limited to, data collection, hazard mapping, interactive science communication, social science research, and community surveys.

- PA1: Unbiased and Inclusive Resilience Planning projects that encourage equitable preparedness, warning systems, and resilience efforts, particularly involving First Nations, Tribal communities, and underserved groups. Projects should include co-designed research with regional organizations, integrating traditional knowledge where appropriate.
- PA2: Effective Communication and Cross-Border Collaboration social science research and products that prioritize clear, consistent, jargon-free communication of scientific and/or engineering findings. Projects should consider cross-border collaboration and be tailored to the varied stakeholder needs (e.g. of public, policymakers, emergency managers, planners, utilities).
- PA3: Translating Science into Action co-designed research and/or product development focusing on practical applications of CRESCENT-related research, including, but not limited to, loss modeling, scenario development and resilience-building for the built environment. Research should be action-oriented, demonstrating how scientific insights can be applied to deliver tangible community benefits, with clear representation from community partners in the project design.

Geoscience Education and Inclusion Priorities:
The Geoscience Education and Inclusion pillar of CRESCENT provides educational opportunities that help build careers and broaden participation in the geosciences. We encourage proposals that develop creative new opportunities for students and professionals seeking earthquake hazard and subduction zone science educational training and knowledge. Specific goals are:

- GEI1: Propose new projects to be implemented through the Undergraduate Twinning Program or the continuation or expansion of research projects initiated through the Twinning Program, enhancing participation and impact for students.
- GEI2: Develop an actionable plan to grow the Cascadia Culture and geoScience Exchange Program (CCASE; https://cascadiaquakes.org/geoscience-education-and-inclusion/ccase/) by exploring partnerships with Tribal secondary schools and community colleges in northern California, Oregon, and/or British Columbia.
- GEI3: Develop a prototype for an educational virtual workshop related to tsunami-focused coastal hazards. Target audiences could include undergraduate to graduate students, scientists at any career stage, emergency managers or other professionals seeking continuing education opportunities. To see a potential example analog, see

EarthScope's Seismology Skill Building Workshop (SSBW; https://www.earthscope.org/education/skill-building-learning/courses/ssbw/).

- GEI4: Develop or expand a workshop, virtual course or other activity for students at any level that develops or expands professional skills and that broadens participation in the geosciences.

Proposals that respond to one or more of the priorities within or across pillars, as outlined below, will be considered for funding. We also encourage science proposals co-designed with partner groups.

PROGRAM AWARD PROCESS

A panel of external reviewers will be recruited to evaluate the proposals using the NSF criteria for intellectual merit and broader impacts. The panel will consist of a broad cross section of scientists and professionals across disciplines and career stages. The panel of external reviewers will make funding recommendations to CRESCENT's Executive Committee, who will make final award decisions in consultation with the NSF.

TIMELINE

Dates	**Item Due**
March 2026	RFP Released
Friday, May 15, 2026 by 11:59 pm PST	**Application Deadline**
Late May 2026	Proposal Review
June 2026	NSF Program Manager Approval
August 15, 2026	Award Notifications
October 1, 2026 – September 30, 2027	**Start Date for Projects** Project Period: *Project length is 1year.*
Due 30 days after end of project period	Final reports Due

ELIGIBILITY

Principal Investigators: Eligible principal investigators (PIs) are any researchers in the US that are part of an institution or organization that is eligible for regular National Science Foundation funding (see details here).

Investigator Responsibilities: By submitting a proposal to CRESCENT, investigators agree to all four conditions below. Investigators who fail to meet these conditions may (a) not receive funding until conditions are satisfied, and/or (b) become ineligible to submit a future proposal to CRESCENT.

1. Community Participation

Principal investigators will interact with other CRESCENT scientists on a regular basis and contribute data, results, and models to the appropriate CRESCENT resource.

CRESCENT is committed to providing a safe, productive and inclusive environment for all center-related activities and therefore expects all participants to abide by the Code of Conduct.

2. FAIR
All research should be conducted in accordance to FAIR (Findable, Accessible, Interoperable, and Reusable) principles for data management and stewardship.

3. Project Reporting
Each grant recipient will be required to submit a final report by October 30, 2027.

Final reports should be no more than 5 pages (including text and figures) and describe the following:

- Did you accomplish what you set out to with this project?
- If not, what did you do differently and how did you account for the changes?
- What is the next step for development of this project/ priority?
- Where do you plan to publish/ present on this work?

Final reports will be made available on the CRESCENT website.

4. Registration of Publications

Principal investigators will notify CRESCENT of publications and products resulting entirely or partially from CRESCENT funding and will acknowledge the work is fully or partially funded by NSF Cooperative Agreement EAR-2225286.

Please use this form to submit details for any product you produce as part of the CRESCENT community, including: journal articles, books, book chapters, conference proceedings, presentation, abstracts, white papers, thesis/dissertation, software, datasets, jupyter notebooks, workshop reports, seed grant reports, and other.

The CRESCENT logo should be used (a) by recipients of CRESCENT support for the purpose of acknowledging that support or (b) to acknowledge CRESCENT assistance or affiliation.

APPLICATION COMPONENTS

CRESCENT Seed Grant applications must be submitted using the online submission form.

1. ***Application Form*** *(online)*:
    a. Provide basic information in the form's text boxes. (Note that the form cannot be saved part way through.)
2. ***Proposal Documents:*** (single-spaced text, Times New Roman font in 11-point or larger, and 1" margins).
    a. **Abstract** (250 words or less): A summary of the project goals and activities. Please write on a separate page from the Narrative.
    b. **Proposal Narrative** (up to 1750 words and 2 figures): Clearly describe the research problems or questions addressed by the project, being sure to specify a gap in the research to be addressed. Specify to which CRESCENT pillar priority (or priorities) the project is aimed and describe how the project goals advance the priority (or priorities). Proposals that exceed length restrictions will be considered ineligible.

c. **References Cited** (no page limit)
d. **Biographical Sketch or CV**: Please submit the NIH or NSF biosketch generated by SciENcv.
e. **Current and Pending Support**: Please submit the NIH or NSF Current and Pending Support generated by SciENcv.
f. **Budget:** Please use the CRESCENT Seed Grant Budget Summary TEMPLATE excel file available on the CRESCENT website.
g. **Budget Justification:** instructions included as an additional tab on the CRESCENT Seed Grant Budget TEMPLATE available on the CRESCENT website.

Submission Instructions: Complete all components of the application and combine them into a single PDF *in the order listed above*, with each component on its own page. Save with the naming convention *[Contact PI Last Name] FY 27 CRESCENT Seed Grant*.

1) Fill out the basic information in the online application form.
2) Upload the complete PDF.
3) Submit the form.

For joint proposals (with PIs from more than one institution), please submit identical proposals (with the same title) with your respective budgets (individual budgets for each PI/institution). The combined total budget for joint proposals should not exceed $30,000.

Letters of support are allowed as additional attachments (adhere to NSF PAPPG format).

BUDGET & USE OF FUNDS

Expected Funding Amount per grant: up to $30,000

Allowable Costs: Funds may be used for costs necessary to plan and execute the proposed research project (consistent with university and state rules) including:

- Travel, which may include funds to support a planning workshop or faculty retreat, to host a distinguished speaker who will help you initiate your project, to visit key resources and/or archives, or to visit a program officer to discuss your project.
- Equipment
- Materials and supplies
- Contractual services
- Salary for career research faculty, graduate students, undergraduates, and/or technical personnel under the supervision of the principal investigator.
- Other direct costs: core/shared user facility use, speaker stipend, etc.
- Faculty summer stipend and/or course release (as per departmental policies and guidelines)
- Indirect cost/ general administrative cost at the federally negotiated rate for the PI's institution

Unallowable Costs:

- Replacing current funding from another internal or external source
- Renovation, remodeling, or alteration of research laboratories or core/shared facilities

REVIEW PROCESS & CRITERIA

CRESCENT staff will conduct an initial review of applications to ensure that proposals comply with all guidelines. A panel of external reviewers, convened by CRESCENT, will conduct a peer review to evaluate the grant proposals and recommend proposals for funding to the Executive Committee who makes the final funding decisions, and will inform applicants of their funding status.

Criteria: Below are the criteria used by the review committee when scoring proposals (adapted from NSF's criteria for proposal review).

1. What is the potential for the proposed activity to advance the identified priorities of CRESCENT's pillars: Science, Geoscience Education and Inclusion, and Partnerships and Applications?
2. To what extent do the proposed activities suggest and explore creative or original approaches to CRESCENT's priorities?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

AWARD PROCEDURE

The University of Oregon (UO) is the lead institution for CRESCENT and receives annual funding from the NSF and other sources. Funded proposals are matched to the most appropriate funding source based on research priorities.

Within 30 days of receiving award notification, investigators must submit a formal request for a subaward through their sponsored research office. CRESCENT/UO reviews the submitted statement of work, budget, and budget justification for each project to ensure they reflect the approved scope. Before the final subaward can be established, CRESCENT/UO submits the complete subaward request to the NSF for final approval.

CRESCENT research awards are funded as subcontracts between UO and the investigator's institution. The budget period for each project/task is set for one year. Carry-over of funds is not allowed, since each budget period represents that year's project task(s) only.

INQUIRIES

Questions about the CRESCENT Seed Grant program or submission process may be directed to cascadiaquakes@uoregon.edu.