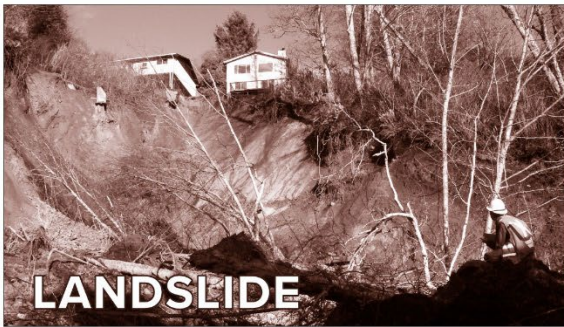




Washington Geologic Hazards Clearinghouse Plan



WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES
WASHINGTON GEOLOGICAL SURVEY

In coordination with:

The Washington Emergency Management Division

The U.S. Geological Survey

The Earthquake Engineering Research Institute

The Pacific Northwest Seismic Network

National Oceanographic and Atmospheric Administration's Center for
Tsunami Research

The Federal Emergency Management Agency



WASHINGTON STATE DEPARTMENT OF
NATURAL RESOURCES
WASHINGTON GEOLOGICAL SURVEY

Washington Geologic Hazards Clearinghouse Plan

To facilitate the gathering, dissemination, and archiving of important and perishable geoscience information during and after geologic hazard events.

Washington Geological Survey, Department of Natural Resources

In coordination with Core Partners in the following organizations:

Washington State Emergency Management Division

U.S. Geological Survey

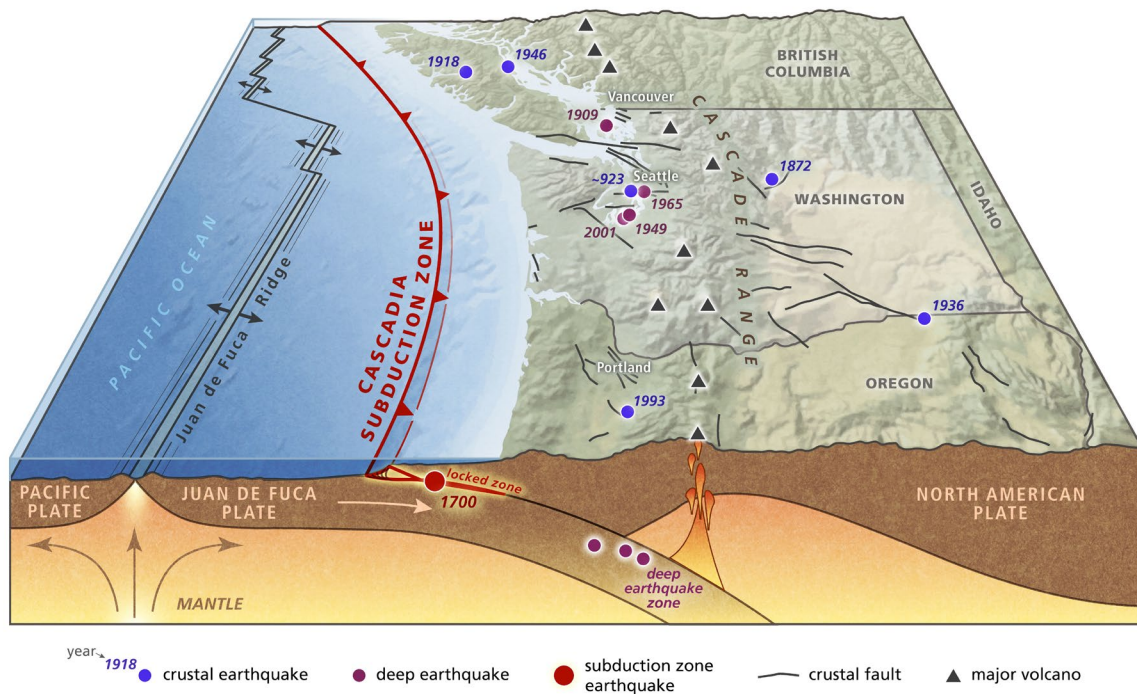
Earthquake Engineering Research Institute

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Last updated February 2024



This graphic shows the geologic setting of Washington State and illustrates some of the historic earthquakes the state has experienced. Washington State is rife with geologic hazards such as the Cascadia subduction zone, capable of producing large earthquakes and devastating tsunamis, deep earthquakes such as the 2001 Nisqually earthquake, and crustal fault earthquakes that focus damage more locally. Landslides, which can occur throughout the state, are the most frequent geologic hazard covered by this plan. Five major active volcanoes in Washington also pose a threat to the communities around them.

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LIST OF ABBREVIATIONS

AEG	Association of Environmental and Engineering Geologists
ASCE	American Society of Civil Engineers
CREW	Cascadia Region Earthquake Workgroup
CVO	Cascades Volcano Observatory
DART	Deep-ocean Assessment and Reporting of Tsunamis
DNR	Washington State Department of Natural Resources
DOGAMI	Oregon Department of Geology and Mineral Industries
EERI	Earthquake Engineering Research Institute
EHP	Earthquake Hazards Program (USGS)
EM	Emergency Manager
EMAC	Emergency Management Assistance Compact
EMD	Washington State Emergency Management Division
EOC	Emergency Operations Center (see also SEOC)
ESF	Emergency Management Support Function
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
ICS	Incident Command System/Center
IMT	Incident Management Team
InSAR	Interferometric Synthetic Aperture Radar
IT	Information Technology
ITST	International Tsunami Survey Team
JIC	Joint Information Center
M	Magnitude (of an earthquake)
MRP	Mission Ready Package
NEHRP	National Earthquake Hazards Reduction Program
NHERI	Natural Hazards Engineering Research Infrastructure
NIST	National Institute of Standards and Technology
NOAA	National Oceanic and Atmospheric Administration
NRB	Natural Resources Building (in Olympia, Washington)
NSF	National Science Foundation
PANGA	Pacific Northwest Geodetic Array
PIO	Public Information Officer
PMEL	Pacific Marine Environmental Laboratory
PNSN	Pacific Northwest Seismic Network
PPE	Personal Protective Equipment
RAPID	Natural Hazards Reconnaissance Facility (operated by NHERI, UW, and NSF)
RCW	Revised Code of Washington
SEAW	Structural Engineers Association of Washington
SEOC	State Emergency Operations Center (Camp Murray near Tacoma, Washington)
UAS	Uncrewed Aerial System (sometimes referred to as UAV)
UNAVCO	University Navstar Consortium
USGS	United States Geological Survey
UW	University of Washington
VHP	Volcano Hazards Program (USGS)
WGS	Washington Geological Survey
WSDOT	Washington State Department of Transportation

CLEARINGHOUSE MISSION STATEMENT

To facilitate the gathering, dissemination, and archiving of important and perishable geoscience information during and after geologic hazard events. These data will support emergency response efforts and will be shared publicly.

AUTHORITY

A division within the Washington State Department of Natural Resources (DNR), the Washington Geological Survey (WGS) is the state's primary public agency with mandates and expertise to study geology and geologic hazards that could threaten the people of the state. The Legislature summarizes the authority of WGS in RCW 43.92.900, saying: *"It is the intent of the legislature that there be an effective state geological survey that can produce essential information that provides for the health, safety, and economic well-being of the citizens."* RCW 43.92.025 further reinforces WGS's authority for identifying and studying Washington's geologic hazards when it states:

(1) In addition to the objectives stated in RCW 43.92.020, the geological survey must conduct and maintain an assessment of seismic, landslide, and tsunami hazards in Washington. This assessment must apply the best practicable technology, including light detection and ranging (lidar) mapping, to identify and map volcanic, seismic, landslide, and tsunami hazards, and estimate potential hazard consequences and the likelihood of a hazard occurring.

(2) The geological survey must: (a) Coordinate with state and local government agencies to compile existing data, including geological hazard maps and geotechnical reports, tending to inform geological hazard planning decisions; (b) Acquire and process new data or update deficient data using the best practicable technology, including lidar; (c) Create and maintain an efficient, publicly available database of lidar and geological hazard maps and geotechnical reports collected under (a) and (b) of this subsection; and (d) Provide technical assistance to state and local government agencies on the proper interpretation and application of the results of the geological hazards assessment.

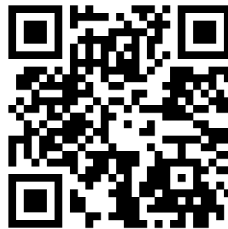
These Legislative mandates underpin WGS's mission to collect, develop, use, distribute, and preserve geologic information to promote the safety, health, and welfare of the people, protect the environment, and support the economy of Washington. Consequently, WGS's mission routinely fulfills the first part of Emergency Support Function (ESF 5) of the Washington State Comprehensive Emergency Management Plan (CEMP), dated March 2019. The scope of ESF 5 is to coordinate *"information collection, analysis, planning, operations, requests for Federal assistance, resource management, deployment and staffing, mutual aid, facilities management, financial management and other support required to prevent, protect, respond to, recover from, and mitigate an emergency or disaster."* During a geological emergency, WGS's mission also supports the emergency response efforts by conducting Clearinghouse functions in support of ESF 5 by *"Identifying staff liaisons or points of contact to provide technical and subject-matter expertise, data, advice and staff support for operations falling within the domain of each applicable agency."* Additionally, Emergency Management Statute RCW 38.52.110 states:

...executive heads of the political subdivisions of the state are directed to utilize the services, equipment, supplies, and facilities of existing departments, offices, and agencies of the state... and the officers and personnel of all such departments, offices, and agencies are directed to

cooperate with and extend such services and facilities to the governor and to the emergency management organizations of the state upon request.”

LINK TO FIELD DATA COLLECTION FORMS

Scan the QR code below, or click [here](#), to access the Survey123 data collection forms.



dnr.wa.gov/clearinghouse/forms

The above link provides access to the online data collection surveys that will be used to gather data during a Clearinghouse activation. These surveys are useable by anyone and do not require a license to access. A full description of the surveys and how they are used can be found in *Appendix C*.

INTRODUCTION

The Washington State Geologic Hazards Clearinghouse (the Clearinghouse) was established by the Washington Geological Survey (WGS) and partners in 2024 with the aim of providing state and federal disaster response managers, affected organizations, the scientific community, and the public with prompt information on the geologic impacts resulting from a significant geologic hazard event in our state. The Clearinghouse may be activated for hazards including earthquakes, tsunamis, landslides, and volcanic unrest.

The Clearinghouse is a place for earth scientists, emergency managers, engineers, and other professionals representing various state agencies, federal bureaus, universities, and other interested public or private institutions to coordinate data collection and dissemination after a geologic hazard event. Clearinghouse staff also work to produce outreach materials that communicate geologic information to the public and all other partners. All data collected by the Clearinghouse is eventually archived and made publicly available.

The Clearinghouse comprises eight committees that are responsible for different components of the Clearinghouse plan, led by the Clearinghouse Management. Clearinghouse Management consists of WGS management, the co-chairs from the lead hazard committee, and core partners management. The committees are divided into **four hazard committees...**

- Earthquake
- Landslide
- Tsunami
- Volcano

...and **four support committees:**

- Data & IT
- Outreach
- Logistics
- Remote Sensing

Each committee will work with designated external partners to respond to geologic hazard events by conducting activities such as: activating the Clearinghouse, deploying field teams to collect data, holding meetings to share information, coordinating with emergency management, handling logistics, conducting outreach, managing data, and collecting and compiling remote sensing information.

For any event that potentially calls for Clearinghouse activation, the Clearinghouse will first hold a conference call with Clearinghouse hazard committee members, core partners, and Washington Geological Survey (WGS) management as soon as possible (ideally, no later than 24 hours after the event takes place). For long duration events like volcanic unrest or distant source tsunamis, the Clearinghouse can be put on standby or wait until after the event to initiate operations. The call will determine whether or not the Clearinghouse will be activated. Once the Clearinghouse is activated, the lead hazard committee(s) will work with the support committees and core partners to organize and conduct data collection efforts and coordinate with emergency managers to ensure data are communicated to the impacted agencies and communities as necessary. Clearinghouse activities should support emergency response and recovery activities in the short term and improve the understanding of natural hazards and how to mitigate their impacts in the long term.

The Clearinghouse group meets as a whole on an annual basis to maintain operational preparedness and strong working relationships among the core partners and participating organizations. Hazard-specific committees may meet more frequently as needed. The Clearinghouse core partners should exercise this plan regularly (ideally annually), and feedback from these exercises should be communicated back to WGS so the plan can be updated.

This document, the Clearinghouse Plan, is a resource for Clearinghouse members, core partners, and anyone interested in participating. The plan describes the main functions and purpose of the Clearinghouse, including the organizational structure of the Clearinghouse, instructions for activation, logistics of setting up the Clearinghouse, and templates for data collection and Clearinghouse meetings and reports. The plan will be periodically reviewed and updated by WGS.

This Clearinghouse plan was inspired by and adapted from the [California Post-Earthquake Information Clearinghouse](#) (2009). We thank the California Geological Survey and their partners for allowing us to use their plan as a template and for pioneering this effort.

CLEARINGHOUSE FUNCTIONS

Following a significant, damaging earthquake, landslide, tsunami, or volcanic event that impacts Washington State, the Clearinghouse will be activated as soon as it is safe and appropriate to do so. Activation starts the process of sending scientists into the field to collect perishable geologic information. These geologic data provide field observations to emergency response efforts, decision makers, scientists, the public, and the media. The data gathered will be made publicly available as soon as they are compiled, organized, and checked to ensure no confidential information is included and that the data are complete and ready for dissemination as determined by the Clearinghouse Management.

The primary functions of the Clearinghouse will be to:

- **Collect important (often perishable) geologic data following a geologic disaster impacting Washington State** (see *Clearinghouse Activation* section for activation criteria). Perishable geoscience information includes observations of transient geologic features or data that may be altered or lost over time due to emergency response efforts and debris-clearing activities, natural processes, or participant memory decay (Wartman and others, 2020¹). Collecting perishable geoscience information may include geologic features (such as fault rupture extent, landslide runout, tsunami runup, and ashfall thickness), and any other data necessary to catalog the hazard (for example, uncrewed aerial vehicle (UAS) footage, tide-gauge data, and hazard-monitoring information). Cataloging this geologic information is critical for understanding the hazard, documenting the area(s) impacted, and informing emergency response and decision making.
- **Provide a location**, real and (or) virtual (as connectivity and capability allow), where participants can coordinate their efforts as part of a larger, temporary organization (the Clearinghouse).

¹ Wartman, Joseph; Berman, J. W.; Bostrom, Ann; Miles, Scott; Olsen, Michael; Gurley, Kurtis; Irish, Jennifer; Lowes, Laura; Tanner, Troy; Dafni, Jake; Grilliot, Michael; Lyda, Andrew; Peltier, Jennifer, 2020, Research needs, challenges, and strategic approaches for natural hazards and disaster reconnaissance: *Frontiers in Built Environment*, v. 6, 573068.
[\[https://doi.org/10.3389/fbuil.2020.573068\]](https://doi.org/10.3389/fbuil.2020.573068)

- **Hold a reconnaissance briefing every evening** during which researchers and field observers will report major findings, including observations of damage or impacts, and coordinate plans for continuing data collection. If there are sites where field teams are concerned about a hazard to life and property, those should be prioritized and brought to the attention of the emergency manager(s) if not done so already. The information discussed in the evening briefings will also be summarized by the lead Hazard committee chair(s), or their designee, and can be made available to the State Emergency Operations Center (SEOC), county/city/tribal Emergency Operations Centers (EOCs), and all other participants.
- **Provide data collection methods to participants** to facilitate systematic gathering, documentation, and dissemination of perishable field data, observations, and findings.
- **Assist in coordination of field investigator deployment** in order to safely and ethically collect data, minimize duplication of efforts, and maximize examination of the affected area.
- **Provide field investigators with data** such as imagery, maps, overlays, and photographs by compiling existing data and collecting new (as appropriate and where capacity and resources allow).
- **Pass along critical information** collected by field investigators (for example road failures, ground damage, impacted areas) to a WGS representative in the Emergency Operations Center (EOC) and (or) within the Incident Command System/Center (ICS), the Joint Information Center (JIC), the State Geologist, core partners, and other appropriate recipients.
- **Work with the Public Information Officers (PIOs)** of responding organizations to provide consistent and up-to-date information on Clearinghouse operations and findings to their respective agencies and to the public when appropriate. The Clearinghouse will coordinate with the SEOC and the Joint Information Center (JIC) as available and requested.
- **Work with Tribes, private industry, and other landowners to discuss land access** and acquire permission for data collection as necessary.

Data Collection and Dissemination

One of the key functions of the Clearinghouse is the collection and dissemination of data. In order to facilitate this process, WGS will provide templates ([link](#) to online surveys) for collecting reconnaissance information. These templates help the Clearinghouse collect data in a coordinated way, making it easier to analyze.

WGS recognizes that some users may need or wish to collect geoscience information on a different platform. If participants need to collect data outside of the pre-developed template WGS provides, they may coordinate with the Data & IT committee who will aim to incorporate their data as their time and resources allow.

Some data, such as remote sensing, UAS, or lidar data, will be coordinated through the Remote Sensing committee and will be made available to the Clearinghouse partners as soon as possible. Other organizations who collect remote sensing data (or other related data) and wish to share it with the Clearinghouse should coordinate their efforts with the Remote Sensing committee.

WGS will provide an online platform for participating agencies and entities to make their geoscience data publicly available and searchable in a timely manner following the event(s), with the exception of any

data that has personal or classified information. Data submission to WGS by participating Clearinghouse partners is voluntary and strongly encouraged.

Note: The Clearinghouse is not a 'gatekeeper' for access to the impacted area. Its objectives in this respect are to (1) have a coordinated effort to collect perishable data, (2) channel researchers and observers away from overburdened local government officials, and (3) help scientists stay out of the way of emergency response efforts. To the best of its ability and knowledge, the Clearinghouse will notify scientists of closed or private areas and will work through appropriate channels to help with access to such areas as appropriate and feasible. When there is time and capacity, arrangements for access into secured areas can be negotiated on an as-needed basis by the Clearinghouse (in coordination with the Incident Command Team) through the provision of letters of passage and contacts with private landowners, local governments, and Tribes.

Clearinghouse Engagement with Emergency Management and Local Jurisdictions

The Clearinghouse will support emergency response efforts by providing important information and subject matter expertise regarding the scale and scope of the disaster. Emergency response activities and recovery efforts receive the highest priority, and Clearinghouse functions should only begin once there has been adequate time for emergency response and when the local Emergency Manager (EM) and Incident Management Team (IMT) allow access (if applicable). For large events where emergency response may take weeks to months (such as a large earthquake or tsunami event) Clearinghouse reconnaissance may be initiated during response as requested and coordinated with emergency management efforts. Depending on the scale of the event and where it happens, a number of jurisdictions may lead the emergency response (city, county, state, federal); the Clearinghouse will work with the jurisdiction(s) who have authority to assign the Incident Commander and designate the emergency operations center (EOC) location. The primary activities of the Clearinghouse important to state and (or) local emergency management will be to:

- (1) Convey the pertinent Clearinghouse information to the appropriate emergency response entities and management efforts and others via PIOs and (or) the WGS liaison to the State Emergency Operations Center (SEOC).
- (2) Provide daily situation reports and essential information to EMs and JIC/ICS.
- (3) Track where field investigators are and work with the ICS (if appropriate) to ensure Clearinghouse participants are not hindering emergency response efforts.

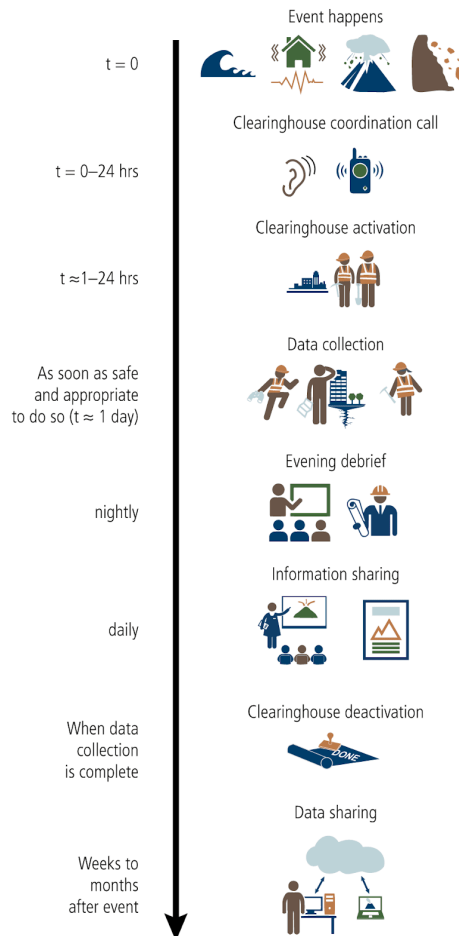
In a federally declared disaster, and in some state emergencies, the Clearinghouse may be asked to contribute critical geologic information to state and federal entities participating in the response.

The Clearinghouse will collaborate with the Earthquake Engineering Research Institute (EERI) and local building officials in their efforts to collect engineering data for buildings and infrastructure damage in an earthquake or tsunami and possibly other events as well. Engineering information will be coordinated through EERI and the jurisdiction having authority. The Clearinghouse is a forum for scientists and engineers to engage in information sharing and to collaborate to assist in emergency response efforts; engineering data and information can be made available through EERI. For details on Clearinghouse functions and details of procedures see *Appendix B: Clearinghouse Operating Procedures and Instructions*.

CLEARINGHOUSE ACTIVATION

Clearinghouse activation will be considered for any geologic event impacting Washington that causes damage, threatens or harms people or property, or creates perishable geoscience information.

For any potentially activating event (as described below) the Clearinghouse will hold a series of coordination calls as soon as possible but no later than 24 hours after the event takes place. If communications are down, Clearinghouse response will be coordinated as soon as possible. The goal of the coordination calls is to determine if the Clearinghouse will be activated or put on standby, and (if activated) to determine the physical location of the Clearinghouse. The calls will be led by the chair(s) of the lead Hazard committee, in consultation with WGS management, and Core Partners for that hazard. Following a decision to activate, not activate, or go on standby, all Clearinghouse core partners will be notified, as will other partners as determined by the hazard committees. Once activation information is available, WGS will update [the Clearinghouse website](#) with event activation information. It is the responsibility of the Hazard committee chair or co-chair, or their designee, to organize the coordination call, any follow up calls (such as standby calls) and contact the appropriate committee members and core partners via the call-down list and protocol as described in the *Internal Appendix*.



Standby Mode

For events where there is advanced warning or signs of geologic unrest (such as earthquake swarms, a distant source tsunami, volcanic unrest, landslide activity, or a heavy precipitation event) the Clearinghouse can be put on standby mode. While on standby, Clearinghouse Management can hold conference calls and prepare for possible activation.

Activating Events

The Clearinghouse plan will be put into operation after geologic events that meet any of the following parameters and when it is deemed safe and appropriate to do so.

Earthquake

Clearinghouse Management, led by the Earthquake committee, will hold a coordination call to discuss possible activation for **any magnitude (M) 5.5 or greater earthquakes in Washington**. The Clearinghouse can also be activated for earthquakes smaller than M5.5 or located outside of the State if there is damage to the built environment or important perishable data to collect.

Tsunami

Clearinghouse Management, led by the Tsunami committee, will hold a coordination call to discuss possible activation for **any tsunami or seiche that causes damage or creates perishable geoscience information impacting Washington**. In the case of a distant-source tsunami for which the National Tsunami Warning Center issues an alert at the Warning, Advisory, or Watch level for Washington State, the Clearinghouse may be put on standby mode to prepare for Clearinghouse activation if necessary.

Landslide

Clearinghouse Management, led by the Landslide committee, will hold a coordination call to discuss possible activation following **any landslide event where people or infrastructure are threatened, injury or casualties are reported or suspected, or infrastructure has been destroyed**.

Volcano

Volcanic events that cause damage or could potentially cause damage in Washington include eruptions, lahars, and ash fall. **If the USGS issues a volcano alert level of ‘Watch’ or ‘Warning’ for a Washington (or neighboring) volcano**, Clearinghouse management will consult with the USGS Cascades Volcano Observatory (CVO) to determine whether the Clearinghouse should be activated or on put on standby. CVO will serve as the lead for volcanic data collection and the Clearinghouse will assist them as requested.

It is possible that there will be a multi-hazard event that requires activation of a Clearinghouse with multiple hazard Clearinghouse committees being called upon to respond to the different events (such as an earthquake and tsunami, or landslides caused by earthquakes). In such instances, Clearinghouse Management will focus on setting up Clearinghouse operations to best respond to the multiple events, with additional consideration of how to efficiently allocate Clearinghouse staff, facilitate coordination between the co-lead hazard committees and partners, locate the Clearinghouse, and generally manage a larger data collection effort.

Timing and Considerations for Clearinghouse Activation

The Clearinghouse should be operational as soon as possible, ideally within 24 hours of an event or when it is safe and appropriate to do so; this will depend on the event (location, scale of damage) and will be decided by the Clearinghouse managers during the activation discussion. If the impacted area is not safe for field teams to physically enter, or if emergency response is ongoing and geologic reconnaissance is not allowed or welcomed by the Incident Command team or the jurisdiction with authority, then physical data collection efforts will wait until the site is deemed safe and the emergency response teams allow access.

If physical data collection is not possible but remote sensing reconnaissance is possible and authorized by ICS, then the Clearinghouse will work with the Remote Sensing committee to determine which remote data collection methods should be used to survey the area and collect data. The virtual Clearinghouse platform (see *Location of Clearinghouse* section below) should be prepared to launch before an event occurs such that it can be ready soon after a geologic event.

The Clearinghouse Management group will determine the duration and scale of Clearinghouse operations depending on the magnitude of the damage. Clearinghouse operations should be reduced as the need for field reconnaissance declines.

Activation and Operation Steps

When an activating event has occurred, the Clearinghouse Hazard committee chair(s) and WGS management will follow the activation steps listed below. The Hazard committee chair(s) responsible for responding to the event will coordinate Clearinghouse activation calls first within WGS, then with the Clearinghouse Management (including core partner organizations), and finally, with other partners (such as neighboring State Geological Surveys) as necessary. *Appendix F* contains example templates for important information to consider during the activation and coordination calls, planning meetings, evening debriefs, and situation reports. Chairs of the Clearinghouse Hazard committees can designate an alternate to take their place if they are unable to perform their duties for whatever reason.

The order and function of the following calls and steps can be changed at the discretion of Clearinghouse Management.

1. **Activation Call:** Call with the Hazard committee chairs and WGS management to determine if full activation or standby mode are appropriate, and (or) whether more reconnaissance or core partner coordination needs to be conducted. If the decision is made to activate, then follow steps 2–9. If the decision is not to activate, or to conduct reconnaissance or standby, then Step 5 should be completed by the outreach committee to let interested parties know the plan.
2. **Committee Coordination Call:** If the decision is to activate, WGS will hold an internal call to activate appropriate committees. This call will be initiated and led by the Hazard committee chair(s) or Clearinghouse Management.
3. **Core Partner Coordination Call:** Activation call or email with all core partners for the hazard (core partner agencies and primary points of contact are listed in Appendix A) to discuss activation logistics. This call will be initiated and led by the Hazard committee chair or Clearinghouse Management.
4. **Determine physical Clearinghouse location** and set date and time of first Clearinghouse activation meeting at a virtual and (or) physical location. Physical location and meeting time should be in coordination with local partners proximal to the event and with emergency management and incident command (if necessary).
5. **Update WGS Clearinghouse website** with activation information (or with information denoting standby operations or a decision not to activate). Other core partners (such as EERI) may wish to provide the WGS Clearinghouse information on their websites as well.
6. **Set-up physical Clearinghouse space** (see *Appendix B* for instructions) and disseminate Clearinghouse activation meeting details to Clearinghouse members and core partners (see next step). The Logistics committee is in charge of setting up the physical meeting space and conference call/hybrid meeting platform is ready in coordination with the lead Hazard committee.
7. **Clearinghouse Activation Meeting** to gather Clearinghouse committees together with core partners and to evaluate the scope of the geologic event and determine a preliminary plan for field investigation and Clearinghouse operation. The meeting will be led by Hazard committee chair(s) and Clearinghouse Management. The activation meeting may be a virtual meeting and (or) a physical meeting, as there may be delays in setting up a physical space.
8. Following the Activation Meeting, the Clearinghouse will hold **daily meetings** to plan for data collection, deploy field investigators, coordinate reconnaissance and outreach, and debrief after

the day's data collection activities. The frequency and timing of these meetings will be determined by the Clearinghouse Management in coordination with core partners and field teams.

9. The Clearinghouse operations should be scaled to fit the needs of the particular hazard event. Clearinghouse meetings and some operations will be **deactivated once data collection is complete**. However, activities such as data clean-up, after-action reviews, and data dissemination may continue for months to years following the event.

Location of Clearinghouse

The Clearinghouse Management (primarily WGS, EMD, USGS, and EERI, with other organizations as appropriate) will arrange for the physical and virtual establishment of a Clearinghouse with input, if possible, from the emergency manager of the region in which the event occurs. If practical, the WGS headquarters at the Natural Resources Building (NRB) in Olympia, WA, will serve as the physical Clearinghouse location, as most of the Clearinghouse infrastructure and staff are located there. However, the primary consideration for establishing a Clearinghouse is to locate it as close as possible to the area where the hazard's impact is most severe so that investigators can minimize travel time to and from the field. Selecting the location of a Clearinghouse should also take into account whether dependable transportation routes and communication channels exist between it and the EOC, although physical proximity may not be as important as electronic connectivity. If the NRB is not usable as the Clearinghouse headquarters, whether due to damage to the building, not being close enough to the event, or for any other reason, a different location will be selected by Clearinghouse management.

If the event happens over a widespread area (such as a long fault rupture, widespread landslides, or a tsunami that impacts the entire coastline), one or more satellite Clearinghouse locations may need to be established to meet data collection needs. Satellite Clearinghouse locations will perform all the basic functions intended for any Clearinghouse operation, although perhaps with less equipment. Proximity to the impacted area(s) and convenience (close to roads and working infrastructure) for researchers outweigh the need for sophisticated equipment.

Hybrid Clearinghouse Meeting Option

A web-based, virtual Clearinghouse will be set up as soon as possible following an activating event. The purpose of the virtual Clearinghouse is to allow remote participants to be involved in Clearinghouse meetings (such as evening briefings) and to provide a forum for sharing and storing information online. The virtual Clearinghouse capabilities will depend on the hazard event and the power, internet, and cellular service available after the event. Ideally, there will be a virtual meeting room where the nightly Clearinghouse meetings can be hosted in addition to or in coordination with the in-person briefing (a hybrid meeting). The virtual meeting should be used for transitory data and communication and not for permanent storage of information.

Facility

The size and staffing of a physical Clearinghouse will be event specific. It could be necessary to have a meeting room large enough to accommodate as many as 100 people, depending on event size and location. When selecting a physical location for Clearinghouse operations, the following factors should be considered:

- Proximity to the study area

- Availability of parking
- The availability, stability, and bandwidth of internet service
- Stability and availability of electricity
- Availability of phone lines and quality of cellular service
- Access to printers and plotters
- Working space for staff (desks, chairs, office equipment)
- Availability of additional computer monitors
- Availability of conference rooms and meeting rooms with adequate space

DEPLOYING FIELD INVESTIGATORS

Following an event, field investigators will be sent to the regions with greatest impacts, based information such as USGS ShakeMaps, witness reports, forecasted areas of impact, and media reports. Discussion about daily deployment of field teams will occur during the Clearinghouse morning and evening meetings. The WGS is not responsible for deployment of other agencies' field teams and cannot dictate where scientists go or what data they collect. However, close coordination and collaboration is strongly encouraged. This supports our aim to cover as much area as possible to maximize collection of important perishable data, and to support emergency response efforts.

Each participating organization is responsible for the safety, coordination, and priority setting for their members. Visiting researchers are responsible for their own equipment, finances, lodging, and travel. There may be opportunities for shared travel and teaming up with WGS or other scientists, but those details cannot be planned ahead of time. Participants in field efforts shall check in with the Clearinghouse Logistics committee before going into the field each day (at the physical location or virtually) to communicate that they are going to the field and to share their planned itinerary. The Clearinghouse Management will report the number of field staff and their approximate location to the WGS SEOC Liaison as required by ESF activation and situational awareness in the Operation Section at the SEOC.

See Part 3 of *Appendix B* and *Appendix C* for more details on field deployment.

Funding Field Operations

Each organization participating in the Clearinghouse will be responsible for its own accounting and costs. Because the Clearinghouse is an emergency response function, it may be possible to recover some costs if the event is a federally declared disaster. This will be determined after the scope of the disaster is known, but federal reimbursement cannot be assured. In disasters for which there is no federal declaration each participating organization would likely bear the costs as part of its normal post-event investigation responsibilities.

CLEARINGHOUSE ORGANIZATION

The Clearinghouse is divided into committees that are responsible for planning Clearinghouse functions before, during, and after Clearinghouse activation. Each Clearinghouse committee (with the exception of Volcano) is led by WGS representatives and can include many core partners.

Clearinghouse Management includes the lead Hazard Committee Chair(s), WGS management, and Core Partners (as relevant to the hazard). WGS management includes the WGS Chief Hazard Geologist, the Assistant State Geologists, and the State Geologist. Clearinghouse Management will designate one of the hazard-specific committee chairs to be the Clearinghouse Director. Clearinghouse Management will be

responsible for Clearinghouse activities and operations and will assign roles and duties in activation calls and as the event progresses. Other Clearinghouse members can be pulled in to assist with Clearinghouse operations as necessary.

The following table summarizes the primary functions of the Clearinghouse Management and Clearinghouse committees:

Committee Name: <i>Primary Agency Responsible & Core Partners</i>	Primary Functions
Clearinghouse Management: <i>WGS</i>	The management will organize and direct the Clearinghouse activities. The Management will work with the outreach committee and PIOs to ensure clear communication and coordination with partner entities, provide media interviews as appropriate, coordinate with jurisdictions to gain access into restricted areas, and help to get approval for large purchases or equipment mobilization. Clearinghouse Management will act as, or designate, a technical liaison to the State EOC Planning/Intelligence function and will be responsible for maintaining voice and data communication between the Clearinghouse and the EOC and updating the EOC on the approximate location of field teams for their situational awareness.
Earthquake: <i>WGS USGS EERI PNSN</i>	<i>For the Earthquake, Landslide, and Tsunami committees:</i>
Landslide: <i>WGS DNR USGS</i>	Data Collection: Collect and (or) work with partner agencies to collect important and perishable geologic data following an occurrence of their committee's hazard. Clearinghouse Operations: Set up the Clearinghouse activation and coordination call(s), facility selection, and partner participation; facilitate Clearinghouse meetings, assuring the effective content and dissemination of information alongside the Outreach committee; assist with data upload alongside the Data & IT committee; and field team deployment.
Tsunami: <i>WGS USGS NOAA State Geological Surveys</i>	
Volcano: <i>CVO/USGS WGS</i>	Data Collection: Collect and (or) work with partner agencies to collect important and perishable geologic data during and (or) following a volcanic event. Clearinghouse Operations: Coordinate with USGS CVO to determine WGS participation in event response, participate in coordination calls as invited by CVO, assist with GIS data and other data/remote sensing collection as requested.
Remote Sensing: <i>WGS USGS</i>	Collect or otherwise contract for the collection of important and perishable data using remote sensing techniques.
Data & IT: <i>WGS</i>	Work with the hazard committee(s) and partner agencies to compile, store, and serve perishable geologic data. Assist in Clearinghouse efforts by staffing the information table at the physical Clearinghouse and assisting with field investigation forms and quality control of data. Support data collection, storage, archival, and dissemination. Ensure network access and network storage of information for access by Clearinghouse members, including setting up permissions and maintaining infrastructure as needed. Interacting with DNR ITD to ensure the Clearinghouse has the necessary IT resources, including when the Clearinghouse is not located at the Natural Resources Building in Olympia.
Logistics: <i>WGS EERI</i>	Administration support for Clearinghouse activities, ensuring smooth communications between participants and access to resources. Assist in Clearinghouse efforts by helping to set up the Clearinghouse workspace, staffing the registration table, providing letters of introduction and passage, helping with daily sign-in and tracking of investigators, helping to keep the

Committee Name: <i>Primary Agency Responsible & Core Partners</i>	Primary Functions
	Clearinghouse running with equipment and supplies, and assisting with tracking WGS expenditures.
Outreach: WGS USGS NOAA	Liaison between the Clearinghouse and outside entities who need up-to-date geologic information about geologic events. Prepare fact sheets, situation reports, assist lead hazard committee with daily briefings, and update WGS website with new information. Report information and planned media releases to the State Joint Information Center (or System) if activated for the incident.

At a minimum, operational staffing requirements will be:

- Clearinghouse director (likely the committee chair from the lead hazard committee or WGS management)
- Geospatial data specialists (from the Data & IT committee)
- Information Technology specialist (from the Data & IT committee)
- Logistics support (Logistics committee)
- Outreach support (Outreach committee)

CLEARINGHOUSE COMMITTEE RESPONSIBILITIES

The following sections describe the responsibilities, likely types of data to be collected, and duties before, during, and after Clearinghouse activation for each committee (see also Part 2 in *Appendix B*). These sections are subject to revision as each committee works to prepare materials and refine their Clearinghouse responsibilities following the release of this Clearinghouse Plan.

Committee Responsibilities for Earthquake, Tsunami, and Landslide Include:

- Collect and (or) work with partner agencies to collect perishable geologic data following a damaging earthquake, tsunami, and (or) landslide.
- Coordinate field team deployment to focus field work in areas the committee deems high priority (see *Appendix D: Field Safety Notes and Resources*).
- Work with other Clearinghouse committees (such as Data & IT and Outreach) to implement data collection templates and provide data to other Clearinghouse partners.
- Coordinate with other agencies to facilitate the dissemination of scientific data and results.
- If the event warrants, trigger other committees to collect related data (such as landslide, tsunami, volcano, and remote sensing).
- Provide pertinent information to emergency managers to guide emergency response efforts and disseminate findings to the public.

Earthquake Committee

Types of Field Data Likely to be Collected by Clearinghouse Field Teams:

- Ground rupture data (such as fault length, dip, strike, rake, offset)
- Liquefaction sites and observations (such as sand blows and submerged infrastructure)
- Ground response data (settlement, lateral spreads)
- Coordinate with EERI and other engineers to collect building damage locations to compare with local geology and strong motion sensors
- Coordinate with PNSN, USGS, and EarthScope to facilitate seismic activity (aftershock) recordings and collect high-precision GPS data
- Landslide and tsunami effects should be referred to appropriate committee
- Work with Remote Sensing committee to fly reconnaissance (UAS and (or) helicopter/airplane), lidar, aerial photos, InSAR, structure from motion, or other collection types as deemed necessary
- Photos and videos
- Citizen science reports (verify and check those that are deemed appropriate by Clearinghouse staff)

Before Clearinghouse Operation:

- Help the Data & IT and Outreach committees prepare data collection surveys, as well as instructions for filling out the surveys.
- Help the Outreach committee prepare an earthquake fact sheet template.
- Work with Data & IT committee to have relevant map layers ready for field teams, including, but not limited to:
 - Orthophotos
 - Lidar
 - Likely seismogenic faults
 - Liquefaction zones
 - Strong motion sites
 - Most-detailed geologic mapping available
 - Detailed road layer and other infrastructure
- Maintain a list of necessary field gear. This information can be distributed to staff and volunteers. Such lists will also facilitate acquiring equipment before or during an event as needed.
- Develop and maintain a call down-roster and procedural details for activation (see *Internal Appendix*).
- Prepare and maintain regional fault context maps and plain-language text describing the tectonics and fault behavior in those regions.

Activities Conducted During Clearinghouse Operation:

- Coordinate the equipping and deployment of field teams.
- Facilitate morning and evening Clearinghouse meetings and communication of daily results between field teams, including identifying remaining areas of interest (see *Appendix F* for templates).
- Coordinate with EERI and the engineering community to report on damage to the built environment and how that relates to ground failure and strong motion recordings.
- Coordinate with PNSN to help deploy seismometers or other geophysical equipment as needed.
- Archive collected data.

Materials Developed During Clearinghouse Operation:

The Earthquake committee will work with the Outreach committee and the Data & IT committee to develop and (or) gather the following materials (as deemed appropriate and if data are available)

- Maps of impacted areas and updates on ground failure.
- Locations of other hazards (such as landslide or tsunami).
- Earthquake parameters (such as aftershocks, focal mechanisms, and rupture models—mostly produced by other people) and relationship to mapped faults/ground failure.
- Download and disseminate ShakeMaps, ‘Did you feel it’ maps, and aftershock forecasts from USGS and PNSN to Clearinghouse participants.
- Evaluate ShakeAlert alerting information results/outcomes (in collaboration with USGS, PNSN and EMD).
- Produce situation reports.
- Create talking points for the website, PIOs, and to ensure participating organizations are communicating similar messaging.

After Clearinghouse Operation:

- Coordinate with partners for any ongoing monitoring or equipment needs.
- Execute quality assurance and clean-up of data delivered by Clearinghouse participants (in coordination with data committee) and ultimately archive pertinent data on the WGS Clearinghouse website.
- Write an After Action Report following the event.
- Give poster and (or) oral presentations summarizing event.
- Generate material for publications.
- Assist with dissemination of data and publications (as available) to the public via WGS website.

Committee Membership:

Lead Entity:

WGS

Member Entities:

USGS: USGS scientists will play a lead role at the Clearinghouse in developing priorities for field investigations. The USGS will also provide primary coordination with the National Earthquake Hazards Reduction Program (NEHRP). This includes providing the key role of coordinator for the national response including collaboration with federal agencies such as FEMA and NIST and assisting coordination with regional agencies. In this role, the USGS can leverage NEHRP resources for staffing field teams as well as coordinate and manage funding from NEHRP and federal agencies for rapid investigations. They may also provide contacts for access to national lands during field investigations. Scientists with the USGS Earthquake Hazards Program (EHP) will be engaged in analysis of data recorded from the outset of the event through the active period of the Clearinghouse. They have critical expertise in particular with producing ShakeMaps and in aftershock relocation/analysis and will update real-time products as new information becomes available. As of spring 2022, USGS-specific earthquake response plans are being revised and further description of their role will change after this revision. At present, USGS will follow the revised NEHRP post-

earthquake response plan when it triggers a response, and for other responses (most events) USGS will follow the USGS Earthquake Science Center response plan.

PNSN: PNSN will lead the field seismological response to the event, providing expertise for and coordination of equipment deployment for seismic and related geophysical observations for immediate capture of post-earthquake transient phenomena such as aftershocks. PNSN maintains staff for field teams to deploy seismic equipment and will complete regular data recovery for prompt analysis by PNSN and other seismologists. PNSN will lead coordination with national facilities (such as Earthscope, Natural Hazards Engineering Research Infrastructure (NHERI) RAPID facility, and the USGS EHP and VHP response teams) to obtain supplemental seismic equipment as needed for event response. They will also coordinate obtaining such resources and efforts as might be suitable and available regionally from appropriate university and industry research teams. The Clearinghouse can help PNSN by providing a venue for reporting their efforts to the broader scientific/emergency response community, as well as identifying Clearinghouse volunteers with field seismological expertise to help staff-up their field teams. Should time and resources allow, PNSN staff may engage in analysis of seismic data to create products useful for Clearinghouse operations (for example precise relative relocations of aftershocks and ShakeMaps) and will provide results of such analysis to the Clearinghouse staff during operations. PNSN will also post a special event page where Clearinghouse staff and the public can obtain up-to-date technical information about the event and a blog post to explain the event to the public. PNSN regularly calculates strong motion parameters, and their staff will work with USGS National Strong Motion Project (NSMP) scientists to ensure such data is available to engineering geologists for use in field operations. Post-Clearinghouse activities will include publishing a summary paper for final seismological technical data about the event.

EERI: EERI will provide coordination for interfacing with the engineering community and also assist in communications with responding national organizations like FEMA. Engineers participating in the Clearinghouse can contribute such assistance as collecting geotechnical data, advising on seismometer placement and mining strong motion data for target areas. EERI will also provide support staff for the Clearinghouse logistics if needed. Though WGS will launch the event website, EERI can serve as a backup website host in the event that WGS resources are severely impacted by the event. They can also host engineering-related information and photos that the WGS website can link to. EERI can help host Clearinghouse debriefs and stand up a separate location if multiple Clearinghouse locations are needed.

Additional Partner Entities:

- WA Emergency Management Division (EMD; state and local): This agency leads and coordinates the emergency response efforts at a state level
- Other State Geological Surveys
- Universities (especially the University of Washington, Western Washington University, and Central Washington University)
- Federal Emergency Management Agency (FEMA): This agency would primarily provide disaster relief assistance.
- Cascadia Region Earthquake Workgroup (CREW)
- American Society of Civil Engineers (ASCE)/Structural Engineers Association of Washington (SEAW)
- National Oceanic and Atmospheric Administration (NOAA)

- Pacific Northwest Geodetic Array (PANGA)
- EarthScope Consortium
- Association of Environmental and Engineering Geologists (AEG)
- Emergency Management Assistance Compact (EMAC): WGS has a template mission ready package, or MRP, to ask for geologists' help from other states.

Landslide Committee

Types of Data Likely to be Collected by Clearinghouse Field Teams:

- Landslide data (landslide type, landslide measurements, land use at site, geology, impacts to the built and (or) natural environment, risks to public safety and (or) resources).
- Photos and videos from field teams and the public.
- Earthquake and tsunami effects should be referred to appropriate committee.

Before Clearinghouse Operation:

- Work with Data & IT committee to have relevant map layers ready for field teams, including but not limited to:
 - Orthophotos
 - Lidar derivatives
 - Land ownership
 - Most-detailed geologic mapping available
 - Detailed road layer and other infrastructure
- Maintain a list of necessary field gear for field teams. This can be distributed to staff and volunteers so they know what they need. Such lists will also facilitate acquiring equipment before or during an event.

Activities During Clearinghouse Operation:

- Coordinate the equipping and deployment of field teams.
- Make contact with local emergency management personnel and other parties prior to going into the field.
- Facilitate morning and evening Clearinghouse meetings and communication of daily results between field teams and identify remaining areas of interest (see Appendix F for templates).
- Work with Remote Sensing committee to fly reconnaissance (UAS and (or) helicopter/airplane), lidar, aerial photos, INSAR, structure from motion, and other efforts as deemed necessary.
- Coordinate with WSDOT and other partner agencies.

Materials Developed During Clearinghouse Operation:

- Mapping of impacted areas and updates on landslide activity for the website, fact sheets, and talking points.
- Situation reports.
- Talking points summarizing best available, and up-to-date, information.
- Fact sheet summarizing the situation for the public and the website.

After Clearinghouse Operation:

- Execute quality assurance review and clean-up of data delivered by Clearinghouse volunteers (in coordination with data committee) in preparation for archival of pertinent data on the WGS Clearinghouse website.
- Write an After-Action Report following the landslide event.
- Make posters and (or) presentations summarizing the event when warranted.
- Coordinate with partners for any ongoing monitoring or equipment needs.
- Publish results of landslide-related data when warranted.
- Facilitate public dissemination of landslide data and publications (as available) via WGS website.

Committee Members:

Lead Entity:

WGS

Other Partner Entities:

- DNR partners: Forest Practices, State Lands
- USGS
- WSDOT
- Universities (such as University of Washington, Western Washington University, Central Washington University)
- Oregon Department of Minerals and Industry (DOGAMI)
- Other state geological surveys
- County and city geologists
- Geotechnical firms
- Federal Highways
- EMD (state and local): This agency would be the lead in emergency response and coordination
- FEMA: This agency would provide disaster relief assistance.

Tsunami Committee

Types of Data Likely to be collected by Clearinghouse Field Teams:

- Tsunami runup (inundation distance from shore, and elevation).
- Flow depth/inundation.
- Land level changes/settlement information.
- Severity of damage to the built environment and coastal structures. Specifically noting the variables that affect different damage levels to be used in future building codes, land use zoning, and planning decision-making.
- Observations about marine and terrestrial features (natural or urban) that have an effect on tsunami energy (diffuse, reflect, refract). Examples include dunes, islands, vegetation, jetties, beach cuts, and streets.
- Observations about impact in terms of contaminants and other urban releases to the environment and how it affects vulnerable coastal populations.
- Geological samples of tsunami sediments (along with recognizable debris left by the tsunami).
- Photos and videos from field teams and the public.

Before Clearinghouse Operation:

- Prepare forms for data collection.
- Organize training and equipment list for field team data collection.

Activities During Clearinghouse Operation:

The Tsunami committee will work in coordination with the data and outreach committees and other partner agencies to conduct the following activities (as deemed appropriate):

- Facilitate morning and evening Clearinghouse meetings and communication of daily results between field teams; identify remaining areas of interest (see *Appendix F* for templates).
- Field team deployment and determination of places to continue to collect data in remaining areas of interest.
- Secondary hazards (such as landslide and liquefaction) reported.
- Work with Remote Sensing committee to fly reconnaissance (UAS and (or) helicopter/airplane), lidar, aerial photos, InSAR, structure from motion, or similar, as deemed necessary.
- Coordinate with EERI and engineering community to report on damage to the built environment and how that ties into ground failure and strong motion recordings.
- Review citizen science reports and social media posts for locations to go collect data (verify and check those that are deemed appropriate by Clearinghouse staff as available).
- Daily briefing to report observations and data collection, in addition to establishing next steps.
- Coordinate with other groups (such as the ITST) to deploy social scientists to conduct interviews for the general public, maritime community, and emergency managers as needed.

Materials Developed During Clearinghouse Operation:

The Tsunami committee will work in coordination with the data and outreach committees and other partner agencies to develop the following materials (as deemed appropriate and available) to provide

to emergency managers and responders, WGS and DNR staff, USGS and other Clearinghouse agencies, and other interested parties:

- Maps of impacted areas and updates on tsunami inundation extent.
- Situation reports.
- Talking points on best available information.
- Preliminary tsunami impact models based on real-time source characterization (through NOAA's Pacific Marine Environmental Laboratory (PMEL) or their NCTR).

After Clearinghouse Operation:

- Work with engineers to collect building damage locations to compare with local geology and strong motion sensors.
- New equipment deployment (such as additional tide gauges, monitoring, and web cameras).
- Find web camera footage and use it to verify tsunami observations and other potential hazards (such as landslides).
- Quality control and organization of data (in coordination with data committee) delivered by Clearinghouse field teams and participants.

Materials likely to be Developed After Clearinghouse Operation:

- Earthquake parameters and relationship to mapped faults and historic tsunamis.
- Inundation extent compared to existing WGS tsunami hazard and evacuation maps.
- Visual representation of data collected (such as maps and histograms).
- Tsunami simulations based on updated earthquake (or other source) parameters and tsunami observation data.
- Make posters and (or) presentations summarizing the event when warranted.
- Event report.
- Publication(s).
- Archive materials on the WGS Clearinghouse website.
- Public dissemination of data and publications (as available) via WGS website.
- Contribute new events and information to the historical database on NOAA NGDC website.

Committee Members:

Lead Entity:

WGS

Member Entities:

USGS: USGS scientists will play a lead role at the Clearinghouse in developing priorities for field investigations. The USGS will also provide primary coordination with the National Earthquake Hazards Reduction Program (NEHRP). This includes providing the key role of coordinator for the national response, including collaboration with federal agencies such as FEMA and NIST, and assisting coordination with regional agencies. In this role, the USGS can leverage NEHRP resources for staffing field teams as well as coordinate and manage funding from NEHRP and federal agencies for rapid investigations. They may also provide contacts for access to national lands during field investigations. Scientists with the USGS Earthquake Hazards Program (EHP) will be engaged in analysis of data recorded from the outset of the event through the active period of the Clearinghouse. They have critical expertise in particular with producing ShakeMaps and in aftershock relocation/analysis and will update real-time products as new information becomes available. Additionally, USGS

scientists who work on tsunamis have extensive expertise in collecting geologic information following tsunami events and we hope that they will provide scientific support in such a tsunami event. As of spring 2022, USGS-specific earthquake response plans are being revised and further description of their role will change after this revision. At present, USGS will follow the revised NEHRP post-earthquake response plan when it triggers a response, and for other responses (most events) USGS will follow the USGS Earthquake Science Center response plan.

NOAA's NTCR at PMEL: In a tsunami activation event, NOAA's PMEL can provide services such as: tsunami models based on data from the event, assessment of the tsunami model and forecasted area impacted to aid in field team deployment, coordination with the International Tsunami Survey teams (ITST), analysis of DART and tide gauge data. PMEL staff have experience of post-tsunami surveys and can support the field survey as a separate team or as part of joint teams. Additionally, PMEL staff can assist in training field survey teams and tsunami data support.

SeaGrant: Washington SeaGrant has a staff that may be able to assist in field data collection, coordination with local entities, and information about coastal hazards.

EMD (state): This agency would be the lead in emergency response and coordination.

Additional Partners:

- Universities such as the University of Washington and Central Washington University
- Other state geological surveys
- EERI
- NOAA ITIC
- National Tsunami Hazard Mitigation Program (NTHMP) members
- International Tsunami Survey Team (ITST)
- NOAA's National Tsunami Warning Center
- FEMA: This agency would provide disaster relief assistance.

Volcano Committee

Committee Responsibilities:

During a volcanic event, WGS will not be the lead entity in Clearinghouse activities and data collection. Instead, the USGS Cascades Volcano Observatory (CVO) will be the lead agency to perform data collection and technical advising during volcanic unrest. However, if requested, WGS is available to assist in activities including but not limited to:

- Collect perishable geologic data following volcanic unrest, including eruptions, lahars, and ash falls.
- Collect aerial and (or) remote sensing data.
- Support GIS and outreach activities.
- Assist in setting up Clearinghouse meetings or logistics.
- Help to coordinate field team deployment.
- Partner with other agencies to facilitate the dissemination of scientific data and results. If the event warrants, trigger other committees to collect related data (such as landslide, tsunami, earthquake, and remote sensing).
- Develop pertinent information as requested by USGS CVO for the emergency managers to guide emergency response efforts and for dissemination to the public.

Types of Data Likely to be Collected/Compiled by Clearinghouse Team:

During a major period of volcanic unrest, USGS CVO predicts that many federal and state agencies, including other parts of USGS, along with universities and other non-government organizations from across the world will likely assist in data collection. Furthermore, groups such as PNSN are already deeply connected in volcano monitoring, with direct links to the CVO offices in real time. Therefore, there are many types of data that WGS would not likely need to collect or distribute. The types of data WGS might be requested to assist in collecting are not clear at this time and will be determined during the event. The area in which CVO indicates the greatest likely need will be in geospatial data management of collected data from field teams, aerial reconnaissance (UAS flights, lidar, and other), and public outreach/response to media requests.

Before Clearinghouse Operation:

- Participate in training exercises with CVO and EMD to practice event response, partner coordination, and event communication.
- Have relevant map layers ready for field teams, including:
 - Orthophotos
 - Lidar
 - Volcano hazards data
 - Most-detailed geologic mapping available
 - Detailed road layer; consider other infrastructure?

During Clearinghouse Operation:

- Assist CVO as requested and WGS resources allow.
- The Volcano committee will work with CVO and the Data & IT committee and Outreach committee to develop and (or) gather outreach materials to provide to emergency managers and responders, WGS and DNR staff, and other interested parties. These materials may include:
 - Maps and databases characterizing impacted areas

- Locations of secondary hazards (such as landslides or seismicity)
- Talking points about best available information

After Clearinghouse Operation:

- Coordinate with partners for any ongoing monitoring or equipment needs.
- Participate in After Action Review.
- Product/publication generation as relevant and necessary.
- Data cleanup and archiving as necessary.

Committee Members:

Lead Entity:

USGS CVO – U.S. Geological Survey Cascades Volcano Observatory and other volcano observatories as necessary: USGS will be the lead science agency, and WGS will serve in a support role, providing resources and information, assisting with logistics, and coordinating with local jurisdictions and agencies (such as WA EMD) as directed by the USGS CVO.

Supporting Entity:

WGS

Other Partner Entities:

- EMD (state and local): This agency would be the lead in emergency response and coordination.
- Universities (especially UW, WWU, CWU)
- FEMA: This agency would provide disaster relief assistance. During the 1980 Mount St. Helens eruption, this agency took the lead in emergency response and coordination.
- FAA: Entity responsible for issuing ash advisories.
- NOAA/NWS: NWS is the entity responsible for issuing flash flood/lahar warnings in event of an eruption.
- PNSN can assist with seismometer deployment and monitoring.
- EMAC- emergency management assistance compact

Remote Sensing Committee

Committee Responsibilities:

Collect or otherwise contract for the collection of perishable data using remote sensing techniques. This committee also assists in the rapid processing and assessment of remote sensing data and disseminates it through the Clearinghouse.

Activation:

When any of the hazard committees are activated following a geologic event, the Remote Sensing committee will be activated and participate in support of the hazard committee. The level of response will depend on the scale of the event and how much support is requested by the Clearinghouse Management.

Duties generally include:

- Planning collection areas and flight parameters for lidar, imagery, and uncrewed aerial systems (UAS) projects.
- Working with vendors to facilitate lidar and imagery collection as well as determine processing needs and timelines.
- Maintaining a collection contract that will allow for data acquisition during a hazard event.
- Working with the hazards committee and outside researchers to define data requirements.
- Working with DNR contract specialists to set up and implement emergency contracts for collection of remote sensing data.
- Additional processing and product generation from remote sensing data, as needed.
- Dissemination and archiving of data.
- Deployment and coordination of UAS teams, coordination with federal and local authorities for flight access and permissions.
- Obtaining access and dissemination permissions to satellite data.
- Work with outside agencies to obtain InSAR data and support any processing requirements for product generation.

Types of Remote Sensing Data Likely to be Requested by Clearinghouse Field Teams:

- Lidar
- UAS data collection
- Imagery and orthoimagery
- Acquisition of satellite imagery, InSAR, bathymetry, and webcam recordings

Materials Developed Before Clearinghouse Operation:

- Keep a current acquisition contract for lidar and imagery data up to date and maintained, to be used at any time in the case of an event.
- Develop workflow guidelines and procedures to ensure the smooth implementation of emergency remote sensing data acquisition, along with documentation.
- Continue to research and stay current on new remote sensing methods and avenues for accessing data.
- Have processing software for UAS collection and lidar data readily available and accessible during an event.

- Work with UAS teams to make sure workflows and expertise are in place and certifications remain current.

Materials Developed During Clearinghouse Operation:

Whether one or more of these activities are initialized may depend on the size, scale, and amount of damage in an event, or by request of another Clearinghouse committee. These services are dependent on Clearinghouse Management approval and adequate funding.

- UAS deployment, collection, coordination, and processing.
- Lidar collection through the DNR contract, rapid processing, interpretation and dissemination.
- Imagery collection through DNR or other state contract, rapid processing, interpretation, and dissemination.
- Generation of structure from motion products, interpretation, and dissemination.
- InSAR processing and coordination with collecting agencies.
- Acquisition of satellite data and other supplemental remote sensing data.
- Management of remote sensing data through the cloud environment.

Materials Developed After Clearinghouse Operation:

- Final product generation
- Final development of simulations/videos of before and after the hazard event
- Quality assurance and data cleanup
- Data archiving and dissemination

Committee Members:

Lead Entity:

WGS

Other Partner Entities:

- DNR – Washington Department of Natural Resources
- USGS CVO Uncrewed Aerial System team
- USGS
- FEMA
- WSDOT imagery collection
- Vendors contracted with the state

Data & IT Committee

Committee Responsibilities:

The Data & IT committee is responsible for managing all geologic data collected during Clearinghouse operations, as well as supporting the IT needs of the Clearinghouse. The committee will be responsible for disseminating data collection templates to all Clearinghouse volunteers and will work with the field teams to ensure that all Clearinghouse data are properly digitized, stored, and backed up. The committee also handles IT-related tasks, such as setting permissions, helping with data transfer needs, and interfacing with DNR ITD to ensure the Clearinghouse has network capabilities. If the Clearinghouse is not located at the NRB in Olympia, the Data & IT committee will ensure that at least one IT and one Data member are present at the Clearinghouse.

Types of Data Likely to be Collected by Clearinghouse Team:

This committee is activated in support of field teams and will not likely collect data directly. The following types of data will likely be managed by the committee:

- Photographs and accompanying metadata.
- Metadata about physical samples (such as soil and rock). The actual samples from non-WGS partners will not be stored or managed by WGS. Clearinghouse staff simply keep track of whether samples have been collected and by whom.
- Scanned/photographed handwritten materials, such as notes and sketches, to be stored digitally.
- Data collected on hazard-specific forms compiled digitally using Survey123 or scanned if filled out on paper.
- Master Clearinghouse geodatabase, containing all the data collected.
- File geodatabases provided by staff outside the Clearinghouse.
- Any other files used or generated by others in the Clearinghouse.

All data collected by WGS (and other willing partner agencies) will ultimately be archived and made available to the public.

IT Support Responsibilities

- Interface with ITD GIS team to coordinate Esri services or licensing as needed.
- Troubleshoot issues with access, data collection, and ingest.
- Administer access to private/federal agencies for additional data (satellite, aerial images).
- Administer permissions to Clearinghouse IT resources for participating members.
- Ensure smooth access, upload, and download of data.
- Maintain cloud space for Clearinghouse activities.
 - Prepare data upload and download script, ingest data to correct location.
 - Set users, permissions, and access.
 - Add server capabilities needed.
- Research and maintain network and communication solutions.

Materials Developed Before Clearinghouse Operation:

The committee will need to ensure the framework for data collection is properly established prior to a geologic event so that Clearinghouse operations can begin as soon as possible after activation. The committee will need to:

- Develop a robust schema for storing data and metadata about each hazard type, taking care to ensure the schema is broad enough to encompass all the different anticipated data types and attributes.
- Prepare printable Word document versions of data collection forms and virtual Survey123 forms for collecting the hazard-specific information requested by the Hazard committees.
- Develop procedures for compiling data from the forms into the master geodatabase.
- Consider the needs of Hazard committees to develop a logical folder structure to store all the data the Clearinghouse might produce.
- Compile and maintain a shared location where ancillary files can be retrieved (for example, core data such as county boundaries and DEMs).
- Produce a basic help guide to best practices of working with Clearinghouse data and computing infrastructure (such as shared network drives and an established folder structure), to be provided to all Clearinghouse volunteers and staff.
- Maintain emergency response hard drives containing base data such as commonly used graphics and existing Survey digital datasets.
- Establish a system for data transfer with others outside the Clearinghouse.
- Set up cloud environment and structure and manage basic permissions, access, and security.
- Continue to research new methods for Clearinghouse operations in order to stay current with technology.

Materials Developed During Clearinghouse Operation:

The main task of the Data & IT committee during Clearinghouse operation is to compile field observations made by field staff and make them available in a database or any other format needed for emergency response and public information. The committee:

- Handles any type of data they receive, including geodatabases provided in a schema different from the Clearinghouse database, and successfully incorporates them into the previously established folder structure.
- Develops, maintains, and documents field data collection forms and provides them to field staff. The team checks in regularly with field staff to see if the forms are meeting their needs.
- Coordinates the downloading, uploading, and compiling of data, including checking in with volunteers to make sure downloading and uploading of data is going smoothly. Data & IT committee staff will help make sure this is working and can develop scripts to automate file handling.
- Champions data best practices, making sure that helpful file names are used and clear folder organizations are used.
- Conducts quality control on the data and works with field teams to ensure data completeness and accuracy.
- Develops a procedure for archiving data into permanent storage and determines how people will get access to this data in the future. This will include determining what data should be made available to the public (for example, photos and maps) and what should be kept internally (such as draft documents and sensitive photos).
- Customize cloud environment for each event.
- Administer permissions to the cloud environment for participating members.
- Ensure smooth access, upload, and download of data.
- Have an IT committee member available on site if the Clearinghouse is not located at the NRB.
- Support field teams as needed for IT concerns.
- Support Public Disclosure Requests.

First priorities of the committee once it has been activated:

1. Establish access to network infrastructure and make sure everyone can access the master database.
2. Support deployment of tool or app for dispatching field staff and ensuring safety check-ins are happening. This is done in collaboration with the Logistics committee. The Data & IT committee can help devise schemas for collection of this information.
3. Train field staff in data collection and submission/upload procedures.
4. Confirm that data are being uploaded properly as they begin to filter in and start conducting quality control on initial data so the committee can provide feedback to staff.

Materials Developed After Clearinghouse Operation:

Once Clearinghouse operations have ceased, the Data & IT committee will work closely with the Clearinghouse director(s) to:

- Clean up and organize the data that were collected.
- Work with field teams to make sure all metadata are complete.
- Archive all field data collected.
- Work with the Outreach committee to set up a website for permanent public-facing archival of information.
- Provide all final data for publication to the website.
- Continue to document all IT-related procedures, including setting up Cloud access, handling permissions, and other network and storage-related needs, with updates on stumbling blocks encountered during the event response.
- The Data & IT committee will support the Clearinghouse in any IT needs following an event.
- Support Public Disclosure requests.
- After action report to determine what went well and what needs to be improved.
- Maintain cloud environment with all records for archival as needed.

Committee Members:

Lead Entity:

WGS

Other Partner Entities:

The data and IT committee will work with data stewards and GIS staff from other agencies to ensure any shared data are being properly represented and attributed. This will include tasks such as making sure metadata for external datasets are complete and accurate. The IT committee will work with external partners to figure out the best platform for transferring shared data. The committee would consult with DNR ITD staff as well as IT staff at the Incident Command Center, if one has been stood up.

Multi-Hazard Response:

The data and IT committee will be activated and have the same responsibilities regardless of how many geologic events take place. It will be up to the Hazard committees to tailor the data collection to allow for multi-hazard data collection.

Logistics Committee

Committee Responsibilities:

Administrative support for Clearinghouse activities, ensuring smooth communication between participants and access to resources. Typical duties include serving as a check-in and check-out coordinator for participants, procuring supplies, equipment, vehicles, and other needed items as requested, and coordinating emergency contracts and other agreements.

Activation:

The Logistics committee will begin operation once alerted to any activation of the Clearinghouse.

Materials Developed Before Clearinghouse Operation:

- A comprehensive equipment list for the Washington Geological Survey, showing field and office equipment, and vehicles in use and available for Clearinghouse operations.
- A finalized procedure and template for check-in and check-out of field personnel and visiting scientists that includes a set of rules around what will happen if someone doesn't check in when they should or does not check out when they should.
- Documentation on procedures for procurement from the agency fire cache and the motor pool.
- Digital and physical copies of the WA DNR Field and Job Safety Information.
- List of equipment and supplies needed should the Clearinghouse activate outside of an established DNR facility.
- Work with the Outreach committee to compile email and cell phone distribution lists for people who will need to be notified of Clearinghouse operations throughout the duration of the response, including when the Clearinghouse has been activated.

Tasks and Responsibilities During an Event (more detail in *Appendix B*):

- Set up office space for the Clearinghouse.
- Daily check-in and check-out of visiting scientists and WGS staff.
- Ensuring visiting scientists have access to Clearinghouse facility and amenities.
- Prepare and manage physical and virtual meeting spaces and telecommunications.
- Assist in notetaking during meetings.
- Locate and procure equipment and supplies from other DNR divisions as needed or from external sources, using WGS equipment list, DNR inventory, DNR fire cache, and other resources as necessary.
- Manage, locate, procure, and assign WGS and agency field vehicles to DNR staff as needed.
- Work with the DNR Finance Office to determine procurement methods needed for emergency purchasing.
- The Logistics committee would work with Clearinghouse Management to obtain and distribute a project code to better track expenses of Clearinghouse operations for WGS staff and purchasing.
- Distribute safety equipment to those requiring it.
- Assist with gaining access to public and private lands, through communication with private landowners and other land management agencies.

Tasks and Responsibilities After Clearinghouse Operation:

- For operations located away from the NRB in Olympia, the committee would dismantle, pack, and transport equipment and supplies for Clearinghouse back to the NRB.

- Ensure return of loaned equipment, gate keys, and vehicles.
- Ensure close-out of contractual agreements related to Clearinghouse operations, once services are rendered and invoiced.
- Track, summarize, and report Clearinghouse expenses if WGS-requested project code is used for the event.
- Hold an After-Action Meeting to determine if plan refinements are needed.

Committee Members:

Lead Entity:

WGS

Other Partner Entities:

The Logistics committee must interact with all visiting scientists from multiple institutions, agencies, and organizations. EERI will help support the logistics committee and assist in coordination of briefing meetings and note-taking.

Outreach Committee

Committee Responsibilities:

The Outreach committee acts as a liaison between the Clearinghouse and outside entities who need up-to-date geologic information about geologic events. These entities include the public, other state agencies, state officials, and in some cases the media, though media requests will be handled primarily by DNR Communications and Public Information officers (PIOs). The committee also ensures that the communications the Clearinghouse releases are consistent with those provided by other core partners.

Activation:

The Outreach committee will be activated as soon as any of the Hazard committees are activated. The level of response will depend on the scale of the event and the degree of support requested by the Clearinghouse Director and (or) management.

Materials Developed Before Clearinghouse Operation:

In order to expedite the communications process following a geologic event, the Outreach committee will need to prepare and compile a number of templates ahead of time. Materials should be flexible for adding partner logos as needed. The committee should:

- Prepare an all-hazard fact sheet template so that a fact sheet can be developed quickly without needing to spend time on layout and design. Note that depending on the region affected, the Outreach committee may need to prepare outreach materials in the primary local languages (for example, Spanish, Vietnamese, or Tagalog).
- Prepare a template for a natural disaster event webpage that matches the fact sheet content.
- Prepare an ArcGIS map template so the committee can quickly produce standardized maps without needing to spend time on layout and design.
- Assist Hazard committees in developing an evening debrief agenda template.
- Compile supporting materials, including maps, graphics, and prepared text relating to the regional geologic tectonic context that generates geologic events in Washington.
- Compile approved logos for DNR and other agencies.
- Compile useful graphics and photos from our shared drives that the committee might want to use on short notice.
- Make a big poster-sized map of Washington with roads, cities, and county outlines. Print off several paper copies to have on hand in case computers cannot be immediately set up.

Tasks and Responsibilities During an Event:

The committee will work with Clearinghouse scientists to develop the following types of information for use among Clearinghouse scientists and field staff as well as outside entities during the response. The Clearinghouse will need to decide which information should be communicated to external audiences and what will remain internal.

- Coordinate with the SEOC Joint Information Center (JIC) and/or Joint Information System (JIS).
- Work with the Hazard committee(s) and PIOs to develop talking points.
- Produce polished maps for media and outreach efforts. Navigational maps for use by field teams will be developed and maintained by the Data & IT, and Logistics committees.
- Create and provide props for media interviews—Maps, posters, and graphics.

- Assist DNR Communications in designating Hazard scientists to conduct media interviews.
- Update the public-facing website that will be continually updated as new information is received, making sure to modify the posted release date and time for each update.
- A fact sheet designed for the public that will be updated when there are significant changes (less frequently than the website). The fact sheet will also have a date and time stamp at the top.
- Direct communications with the State Geologist, Chief Hazards Geologist, EOC, DNR Emergency Management, and DNR Communications. These entities will pass the information to where it needs to go. In this way, the Outreach committee will act as a communications hub.
- Develop supporting materials for a daily debrief provided in person at the Clearinghouse headquarters for all Clearinghouse staff, to be facilitated by the Hazard committees.
- Help to generate information for social media posts (via DNR Communications).
- Coordinate with Hazard committee chairs to send internal and external email communications to keep all parties updated on the current status and progress of operations.
- Arrange for outreach materials to be translated into local languages, as needed.
- Other materials will be created on demand, as requested, and as capabilities allow.

Note: Any media inquiries must be routed through DNR Communications. We do not respond to media requests ourselves.

Materials Developed After Clearinghouse Operation:

- Final public-facing Clearinghouse website, fact sheet, and posters.
- Assistance with after-action report.
- Assistance with event-specific publications.
- Other materials will be created on demand, as requested, and as capabilities allow.

Committee Members:

Lead Entity:

WGS

Other Committee Entities:

DNR Communications

Additional Partner Entities:

- WA EMD
- USGS
- FEMA
- NOAA
- EERI
- PNSN

Appendices:

APPENDIX A: LIST OF CORE PARTICIPATING AGENCIES AND PRIMARY POINTS OF CONTACT

The organizations listed below are considered the core partners of the Clearinghouse. The people listed for each organization are primarily program leads at their respective entity and are the primary points of contact for their organization. In a Clearinghouse activation, many more partners from within these agencies and from other entities will be called on, or will volunteer, to help respond. The names of people listed are those that we worked with to develop this plan when it was published in 2024. People may leave their current positions and this document will be updated every year or so to reflect that to the best of our ability.

Washington Geological Survey

General inquiries to the survey: geology@dnr.wa.gov

Inquiries about the Clearinghouse: clearinghouse@dnr.wa.gov

Managers

- Corina Allen: Corina.Allen@dnr.wa.gov, 360-791-0647
- Jessica Czajkowski, Jessica.Czajkowski@dnr.wa.gov, 360-763-2939
- Alexander Steely, Alex.Steely@dnr.wa.gov, 360-999-0115
- Casey Hanell, casey.hanell@dnr.wa.gov, 360-528-1470

Hazard Committee Chairs

Earthquake:

- Megan Anderson: Megan.Anderson@dnr.wa.gov, 360-764-0021
- Andrew Sadowski: Andrew.Sadowski@dnr.wa.gov, 360-584-8821

Tsunami:

- Alex Dolcimascolo: Alex.Dolcimascolo@dnr.wa.gov, 360-742-7571
- Daniel Eungard: Daniel.Eungard@dnr.wa.gov, 360-463-2648

Landslide:

- Kate Mickelson: Kate.Mickelson@dnr.wa.gov, 360-810-0006
- Mitch Allen: Mitch.Allen@dnr.wa.gov, 360-819-0436

Volcano (to assist CVO)

- Corina Allen: Corina.Allen@dnr.wa.gov, 360-791-0647
- Jessica Czajkowski, Jessica.Czajkowski@dnr.wa.gov, 360-763-2939

Other Committee Chairs

Data & IT

- Susan Schnur: Susan.Schnur@dnr.wa.gov, 360-701-6122
- Sheelagh McCarthy: Sheelagh.McCarthy@dnr.wa.gov, 360.972.5149

Outreach

- Susan Schnur: Susan.Schnur@dnr.wa.gov, 360-701-6122
- Nikolas Midttun: Nikolas.Midttun@dnr.wa.gov, 360-463-0864

Remote Sensing

- Abby Gleason: Abigail.Gleason@dnr.wa.gov, 360-764-0799

Logistics

- Crystal Joselyn: Crystal.Joselyn@dnr.wa.gov, 360-870-4379
- Rachel Rinehart: Rachel.Rinehart@dnr.wa.gov, 360-522-2201
- Todd Lau: Todd.Lau@dnr.wa.gov, 360-791-0795

United States Geological Survey

Earthquake

- Erin Wirth Moriarty: emoriarty@usgs.gov
- Brian Sherrod: bsherrod@usgs.gov
- Steve Angster: sangster@usgs.gov

Landslide

- Jonathon Godt: jgodt@usgs.gov
- alex grant: agrant@usgs.gov
- Corina Cerovski-Darriau: ccerovski-darriau@usgs.gov

Tsunami

- Stephanie Ross: sross@usgs.gov
- Nathan Wood: nwood@usgs.gov
- Bruce Jaffe: bjaffe@usgs.gov

United States Geological Survey Cascades Volcano Observatory

- Jon Major: jjmajor@usgs.gov
- Holly Weiss-Racine: hweiss-racine@usgs.gov
- Wes Thelen: wthelen@usgs.gov

Earthquake Engineering Research Institute

- Maggie Ortiz-Millan: Maggie@eeri.org
- Heidi Tremayne: heidi@eeri.org
- Elizabeth Angell: elizabeth@eeri.org

Washington State Emergency Management Division

- Maximilian Dixon: Maximilian.Dixon@mil.wa.gov

- Elyssa Tappero: Elyssa.Tappero@mil.wa.gov
- Brian Terbush: Brian.Terbush@mil.wa.gov

Pacific Northwest Seismic Network

- Harold Tobin: Htobin@uw.edu
- Renate Hartog: JRHartog@uw.edu

Federal Emergency Management Agency

- Hannah Rabinowitz: hannah.rabinowitz@fema.dhs.gov

National Oceanic and Atmospheric Administration's Center for Tsunami Research

- Christopher Moore: christopher.moore@noaa.gov

APPENDIX B: CLEARINGHOUSE OPERATING PROCEDURES AND INSTRUCTIONS

Below are instructions for setting up stations (Part 1), explanations of the functions that need to be performed (Part 2), and guidance for field operations (Part 3). Clearinghouse setup, functions, and assignments are overseen and directed by the Clearinghouse Management.

Part 1: Set up for physical and hybrid Clearinghouse

Virtual/Hybrid Clearinghouse for preliminary meeting and that remote participants can use for attending meetings (assuming internet service)

- a. Lead Hazard committee director (with help from Logistics committee) sets up a virtual/hybrid meeting forum for hosting coordination calls, evening debriefings, and any other necessary meetings.
- b. Once a virtual meeting space is established, send link and meeting schedule out to Clearinghouse committee members and core partners.

Registration tables for scientists, engineers, and the media: 1–2 staff members (Logistics committee with help from other committees and core partners)

- a. Registration Table for Scientists and Engineers. Set up at entrance. Identify with a sign.
 - i. Log sheet for mandatory daily sign-in and sign-out and collection of following information:
 - Name
 - Organization
 - Associated Hazard committee/data collection type (earthquake, landslide, tsunami, volcano)
 - Purpose of field work
 - Location of field work
 - Others in your group?
 - Contact info: Cell #, email, Satellite phone #, radio
 - Departure time
 - Expected return time
 - ii. Provide Clearinghouse Contact Information so field researchers know who at the Clearinghouse to contact if they need assistance or have a question. Print this out and also list it on the Clearinghouse webpage.

Information Table and Field Investigation Forms: 1 staff member (Data and Logistics committees)

- a. Set up a table near the registration table. Identify with a sign.
 - i. Instructions for field investigators for data collection (printed versions of *Appendix C* of this plan).
 - ii. Field Safety Notes and Resources (Printed Versions of *Appendix E* of this plan).
- b. Distribute Field Investigation Forms (ENCOURAGE THEIR USE).
 - i. Have printed versions available if needed, but online survey is preferred.

- ii. Have a computer, tablet, and cell phone to show people how to access and use the online forms and assist if needed.
- c. Have a computer and monitor to show locations of previous day's damage updates (print-outs if possible).
- d. Distribute all press releases, weather reports, road closure info, reports on utilities availability, maps, fact sheets, and other useful info for field investigators.

Daily Briefing Area (Logistics committee to set up)

- Arrange space to accommodate about 100 people, depending on the event's impact, for daily discussions
- Chairs
- Podium or table
- Virtual/hybrid meeting capability (OWL or other camera/web conferencing/in person meeting technology)
- White board and markers
- Flip charts and large Post it pads on easels and markers
- Wall space for posting materials
- Projector and white wall or screen

Part 2: Functions

Provide Letters of Introduction and Passage: 1 staff member (Logistics committee or anyone available)

- a. Make letters of introduction available to field investigators as necessary. Equipment and supplies needed:
 - i. Letterhead (digital and printed)
 - ii. Computer
 - iii. Log of areas where access permissions have been granted, along with when, where, and who provided it.
- b. Assist with requests for permission from authorities for passage into restricted areas. Equipment and supplies needed:
 - i. Map of impacted area with land ownership/parcel information.
 - ii. Emergency management points of contact (for example, sheriff, emergency manager) (see the *Internal Appendix* for emergency manager contact information).

Data Collection, Upload, and Verification: 2–3 staff members (Data & IT Committee, Lead Hazard Committee, and EERI)

- a. Collect and disseminate information from previous day's data collection on damage surveys, Situation Reports, and fact sheets (Data & IT committee and Hazard committees). **Important to ensure daily situation reports get delivered to EMD and local EMs.**
- b. Enter the information into the database system (Data & IT committee).
- c. Moderate daily briefings (lead hazard committee with help from EERI and core partners).
- d. Take notes during evening proceedings & report to regional and (or) state EOC (lead hazard committee with help from core partners).
- e. Retrieve and present information for use by Clearinghouse participants.
- f. Prepare update for next day's field assignments (lead hazard committee with help from core partners).
- g. Immediately notify the regional and (or) state EOC and (or) ICS of findings relevant to emergency response (lead hazard committee and Clearinghouse Management).

Track Investigators and Data Collection: 1–3 staff members (Lead Hazard committee, Logistics committee, and Data & IT committee)

- a. Review updated check-in/check-out logs to see where people have been, are currently, and where we still need to go (Lead Hazard committee and Data & IT committee).
- b. Ensure that everyone has checked back in for the day.
- c. Review updated damage survey reports (Lead Hazard committee) and plan for future data collection based on places visited and reported/observed impacts.
- d. Review/plot locations of observed/not observed areas on map (Lead Hazard committee and Data & IT committee).
- e. Work with check-in/check-out to get priority areas and issues covered (Lead Hazard committee and Data & IT committee).
- f. Report at daily briefings (Lead Hazard committee).

Connection to Regional/State EOC: 1 liaison person (Clearinghouse Management)

- a. Establish and maintain connection and role (in person, virtual, phone) with the EOC(s).
- b. Funnel damage reports, situation reports, and assorted information as necessary and appropriate.

Connection to Other Organizations: 1 staff member (Clearinghouse Management with help from other committees and core partners)

- a. PNSN
- b. USGS
- c. NOAA (tsunami)
- d. Other State Geological Surveys (as necessary)
- e. PIOs and Clearinghouse website (Data & IT committee and Outreach committee)
- f. FEMA Regional Response Coordination Center

Keep Clearinghouse Running: 1 staff member (Logistics with help from other committees and core partners)

- a. Identify and procure needed supplies and equipment.
- b. Check-out and check-in equipment.
- c. Arrange for trash pick-up and cleaning.
- d. Help with purchasing food and water.
- e. Deal with security, access issues, and parking.

Finance/Administration: ½ time for one staff member (Clearinghouse Management and Logistics with help from other committees and core partners)

- a. Keep track of and approve expenditures/borrowings/gifts for WGS staff.
- b. Help coordinate and pay for costs associated with aerial or water reconnaissance as necessary.

Part 3: Field Operations

Organizational Responsibility

Each participating organization is responsible for the safety, coordination, and priority setting for their members. Visiting researchers are responsible for their own equipment, finances, lodging, and travel. There may be opportunities for shared travel and teaming up with WGS or other scientists but that will not be known ahead of time.

Field Participant Information

Participants in the field shall provide numbers/addresses (cell phone, satellite phones, emails) so that the Clearinghouse is able to contact them for safety. A summary of visitors' specialties and field investigation priorities will be helpful in field investigations and tracking.

Communication with the Clearinghouse

Safety of the field investigators is of the utmost importance. In order to strive for a safe data collection, we ask that participants in the field shall:

1. Check in with the Clearinghouse (at the physical location or virtually through the logistics committee) to communicate that you are going to the field and to share your planned itinerary before going into the field at the beginning of each day.
2. Check with the relevant Clearinghouse hazard director to ensure the area you are hoping to visit is accessible and that any emergency response efforts are finished or that we have permission to investigate there.
3. Contact the Clearinghouse as priorities or itineraries change.
4. Contact the Clearinghouse at least once daily with an update on observations, ideally at the evening debriefing. If there are important life safety observations that need to be addressed during the day please call 911 if necessary and (or) work with the lead hazard committee chair or management to notify the appropriate emergency management of the situation.
5. Check out with the Clearinghouse at the end of each day (at the physical location or virtually through the logistics committee).

Requesting Aerial and (or) Water Reconnaissance

For many geologic events it may be necessary to document damage via aerial and (or) water reconnaissance. With consideration of the event, the location of damage, the scale of damage, and the risk to geologists and the pilots/captains of the necessary vessels/aircraft, WGS reconnaissance requests will be handled by Clearinghouse Management during the event response with approval from the State Geologist. Requests for piloted aerial (plane or helicopter with or without geophysical tools) or UAS support will be coordinated with ICS as appropriate. Requests for water reconnaissance (motorboat, canoe, dive team, or other geophysical water equipment) will be coordinated with ICS, DNR, USGS, UW, and other agencies as appropriate.

APPENDIX C: INSTRUCTIONS FOR FIELD INVESTIGATORS AND LINKS TO SURVEY123 FORMS

Roles and Responsibilities for Data Collection

Welcome to the Clearinghouse. These instructions will save you time, ensure your safety, improve your access to damage sites, ensure that your observations will be noted and used by other field investigators, and subsequently archived.

Geologists/Geoscientists: Geologic field investigators are expected to assess the nature and extent of:

- Earthquake-induced ground effects, for instance, ground rupture and liquefaction.
- Tsunami impacts: runup, flow depth, maritime damage, debris, and tsunami deposits.
- Landslide features: impacted area, scarp, runout, and secondary hazards.
- Volcanic deposits and impacts as requested by USGS CVO.

Geologists and geotechnical engineers are asked to report their findings on the Clearinghouse Survey123 forms developed by the Washington Geological Survey. These survey forms, which provide a systematic field assessment of different hazard parameters (such as fault rupture, liquefaction, tsunami extent, landslide area), are available using the QR codes to the right, or the links and QR codes at the beginning of this plan and the end of this appendix. It is strongly preferred that you collect data using only the Survey123 forms. If you would like to collect geologic data using a different approach (such as FieldMaps or a field notebook and GPS), please also fill out a Survey123 form so that we can track where data has been collected and then coordinate with the Data & IT committee to submit your data.

Engineers: Engineering field investigators are expected to assess the nature and extent of earthquake or tsunami ground effects and damage to structures and infrastructure. In addition to documenting structural damage, field investigators should attempt to determine failure mode, factors such as geologic site effects that may have contributed to failure, possible implications of the damage, and any secondary impacts. It is also important to mark where buildings were not damaged. Engineers will report their findings on the Field Investigation form developed by EERI.

Social Scientists: Social Scientists are expected to gain an overview of the impacts of the hazard on human behavior and community institutions, noting where possible, impacts on at-risk, populations, government operations, and commercial and economic activity. Social scientists are responsible for their own data collection methods adhering to ethical human data collection practices.

All Investigators: Before you leave for the field, please do the following:

1. Sign in at the physical registration table or sign in virtually.
2. At the information table, collect all press releases, most current fact sheets, daily damage updates, and information about local conditions, road closures, water, power, communications status, and sanitation availability.
3. Access Survey123 forms from the Clearinghouse webpage here: dnr.wa.gov/clearinghouse/forms.
4. Pick up and fill out a release form at the Clearinghouse sign-in table.
5. Conduct a daily tailgate meeting with your field team prior to leaving the Clearinghouse, referencing the safety notes and procedures outlined in *Appendix D*.
6. In addition, perform the following steps to help you maximize your effectiveness as a Clearinghouse participant:
 - a. Coordinate your planned field investigation with the Clearinghouse Manager

- b. While in the field, complete a Survey123 form associated with the hazard (earthquake, tsunami, or landslides) for each major hazard feature or site you visit.
- c. Additional photos, videos, or media outside of the Survey123 form will be submitted through Box (deptofnaturalresources.box.com/s/74c0ckj4fnsoukxgpmoctquapkp271uk). Include your name, date, location, and description of each additional media upload to Box.
- d. Each evening, field investigators return to the Clearinghouse for a debriefing session. We encourage your participation.
- e. Ensure that each Survey123 form gets successfully submitted so your observations can be incorporated into the damage and effects database. GIS maps will be generated and regularly updated from that database.
- f. At the end of each field day, check out with the Clearinghouse to help ensure all field teams end the day in a safe place.
- g. Every morning, before heading back out into the field, please coordinate with the Clearinghouse (or visit the website if it is updated) to pick up the updated damage reports, fact sheets, and GIS maps that will help you focus your investigations and communicate with the public while in the field.

Survey123 Forms Information and Links

The Clearinghouse will primarily use Survey123 forms to collect field data including location, geologic observations, photos, and other important information. Individual Survey123 forms were created for each of the major geologic hazards (earthquakes, tsunamis, landslides). The Survey123 forms are strongly preferred, but for field investigators who would like to use FieldMaps to collect detailed geologic information, please work with the Data & IT committee to ensure your data are collected and combined with the Survey123 data.

Data submitted from these forms will be reviewed and incorporated into digital and print map products by the Data and Outreach committees that will be used to communicate spatial geologic information with the Clearinghouse and public. Examples of these products include interactive ArcGIS Online web applications, dashboards, printed hazard location maps, etc.

- Each Survey123 form includes instructions for how to fill out field data collection information specific to the natural hazard.
- You do not need an ArcGIS Online subscription to fill out the Survey123 form.
- Anyone with access to the Survey123 link or QR code (below) can fill out and submit a form on their mobile device or laptop.
- Forms can be accessed through any web browser or by downloading the Esri Survey123 application on your mobile device.
- The Survey123 forms allow you to take representative photos using your device within the form, please use this function within the form as it will attribute and geolocate the photos.
- Survey123 also allows for drawing lines and polygons in addition to collecting point data. Some of the Clearinghouse forms have options to collect these features.
- Any data collected as a part of the Clearinghouse effort will be checked for quality and accuracy before being made public. Keep in mind that none of the data provided to WGS as a part of the Clearinghouse can be kept confidential.

Link to the Survey123 field data collection forms

dnr.wa.gov/clearinghouse/forms



APPENDIX D: FIELD SAFETY NOTES AND RESOURCES

Prior to starting field work, please conduct a tailgate meeting with your team to go over safety procedures and make sure you have all the field equipment, personal protective equipment (PPE), and information you need to safely conduct field work in a hazard area. Some questions and topics to consider and make a plan for during your tailgate meeting are:

- Did you check in at the Clearinghouse and let the registration table/Logistics committee know where you are going?
- Do you have all the PPE you need? Depending on where you will be and the nature of your work this will vary. Equipment to consider: safety vest, boots, hard hat, safety glasses, Kn95 mask, flashlight/headlamp, gloves, traffic cones, and flagging.
- Do you have a first aid kit?
- Do you know where the closest hospital is to the area you are traveling to?
- Do you have a spare tire and the equipment to change a tire if necessary?
- Will you be traveling in a remote area that likely doesn't have cell service? If so, consider teaming up with a team that has a DNR radio and knows how to use it.
- Do you have identifying information (including badge, business card, logo apparel)?
- Do you have essentials for the day? Some things to consider are: food, **plenty of water**, snacks, sunscreen, protective clothing.
- Do you have the maps and data you need on your device to get you where you need to go? Some things to consider: GPS, printed map, road closure information, points of contact, and permission for the area you're going to, if required.

The following list outlines some of the dangers involved in field geology. By being aware of these hazards, we can be prepared to prevent and (or) deal with them. It is by no means a complete list.

- Vehicles—drive defensively, wear seat belts, maintain vehicles, stock them with emergency supplies, and don't take chances.
- Foot and leg injuries—wear sturdy boots and try to watch your step.
- Eye injuries—wear safety glasses when taking rock samples with a hammer.
- Falls—avoid climbing steep rock faces, particularly if working alone.
- [Rockfall](#)—watch for loose boulders and watch your step. Wear a hard hat if you are ever in a setting where an object could fall onto you, such as at the base of a steep cliff.
- Wildfires—plan escape routes and don't linger if a fire is nearby.
- [Hypothermia](#)—keep extra clothes in your pack *at all times*.
- Dehydration—carry plenty of water, and drink it often.
- [Heat exhaustion](#)—at first sign, find shade, rest, and hydrate.
- Animal encounters: Be prepared to encounter animals in the field and learn what to do ahead of time: [Bears](#), [mountain lions](#), and [snakes](#), are just a few examples of potentially dangerous animals you may encounter.
- If you encounter someone who doesn't want you on their land or is threatening you in any way please respect them and their property, apologize for intruding (even if you have permission) and leave. When back at the Clearinghouse we can arrange for site access if possible.
- If at any point you do not feel safe or you question the safety of the situation for you, your field partner, or others in the area, please call 911 if necessary and (or) leave the area and report the issue to the emergency management point of contact for the incident. If you do not know who that is, contact the Clearinghouse manager and inform them.

What to do if you get injured:

- If your injury is life threatening or you are not sure and need immediate assistance, call 911.
- If you need to and can safely get to the hospital then do so as soon as possible. Let the Clearinghouse know that you were injured and where you are.
- If you can treat your injury in the field with your first aid kit please do so. If you are a DNR employee, please let your supervisor know, and fill out an Initial Injury Report ([IIR](#)) within 24 hours of injury.

APPENDIX E: EQUIPMENT FOR WGS PERSONNEL AND CLEARINGHOUSE FACILITY

Personal Equipment to bring to Clearinghouse activation:

- Government I.D. and business card(s)
- Appropriate clothing: rain gear, sun hat, sunglasses, hiking shoes, sunblock
- Day-glow vest
- Computer and (or) tablet
- Phone
- Food/water
- Your own field gear (data collection gear, PPE, shovel, tablet, GPS, and so on)

Logistics committee Equipment (need to bring to Clearinghouse facility):

- 2 laptops and chargers (can be used by logistics and a spare)
- Extra power equipment: batteries, chargers, memory cards, adapters
- Name tags (stick on “Hello my name is” type)
- White board
- Flip charts/ large Post it pads on easel
- Wall space for posting materials and stuff to stick things to the wall (tacks, tape etc.)
- Projector and white wall or screen for projections
- Setup with a computer with capability of hosting virtual meetings (camera, speaker, screen etc.) such as a meeting OWL
- Office supplies: pens, pencils, notepads, scissors, tape, dry erase markers, sharpies, rubber bands
- 4 surge protector power strips
- 2 extension cords
- thumb drives
- coffee maker and coffee supplies
- case of water bottles
- some snacks
- clipboards

General Field Gear (can be used by anyone in WGS)

- Write-in-rain field notebooks
- Duct tape
- Flagging tape
- Spray paint
- Phone tripod
- Binoculars
- Compasses (Brunton)
- Flashlight/headlamps
- First aid kits
- Sample bags
- Dry bags
- Measuring tapes
- Handheld rangefinders
- King radios
- GPS

- Hard hats
- Safety vests
- Box of gloves
- Safety glasses
- Kn95 masks
- Travel size sunscreens
- Shovels
- Hand saws

Earthquake Equipment (to gather and bring to Clearinghouse when activated-one set per team)

- Printed/digital materials: topographic, road, geologic maps, liquefaction zones, air photos, paper data forms, sediment size and sorting chart, WGS/Clearinghouse contact list, local hospital info (one set per team)
- Clipboard
- Writing utensils: pencil, pen, sharpie (get from logistics if needed)
- Field notebook (Rite-in-the-rain recommended)
- Tools for dirt road access and safety: shovel, bow saw, wasp spray
- Traffic cones (1–2 per vehicle)
- Orange safety vest
- 5-gallon water jug
- Field backpack (one per team member)
- Tablet
- Hand-held GPS
- Cell phone
- Inverter or USP cigarette-lighter adapter
- Radio & manual, quick start guide and current repeater map
- Compass (Brunton, Silva, Suunto, or phone app)
- Tape measures (~3 m retractable and 10 m fabric or similar)
- Trowel (or Nejiiri Gama)
- Sample bags (30 per team)
- Umbrella
- Protective gloves (leather or similar)
- Hard hat (one per team member)
- Headlamp (one per team member) + extra batteries
- First aid kit

Landslide Equipment (to gather and bring to Clearinghouse when activated)

- Handheld range finder
- Flashlight/headlamp
- First aid kit
- Cameras
- Binoculars
- Extra power equipment: batteries, chargers, adapters, memory cards, surge protector
- Safety gear -Hard hat, day-glow vest or field jacket, eye protection, gloves
- Tablets
- Cell phones
- Radios

- Laptops
- Rock hammer and (or) paleopick
- Appropriate clothing and personal items, including rain gear, sun hat, sunglasses, hiking shoes, sunblock

Tsunami Equipment (to gather and bring to Clearinghouse when activated)

- Go-bag duffel/backpack containing all of the following:
- Folder/clipboard containing: inundation and evacuation maps for area of interest, imagery map, contact information sheet of state Emergency Managers and local Harbormasters, other local hazard or tsunami specific information as necessary.
- Trowel
- Pencil case with 2 sharpies, 2 pencils, and 2 sidewalk chalks
- Carpenter-style measuring tape

Remote Sensing Equipment (to gather and bring to Clearinghouse when activated)

- Laptops and external hard drives (for working/processing), power supplies
- Cell phones
- UAS equipment (UAS, batteries, power station, power cords, controller, camera, SD cards)
- Tablets or other mobile device for data collection
- UAS license (pilot(s))
- Safety equipment (hardhat, eye protection, vest, fire extinguisher, flagging)

Outreach Equipment (to gather and bring to Clearinghouse when activated)

- Laptops, two of which should have a local install of ArcGIS Pro and the full Adobe Suite
- Video equipment if needed (video camera, stabilizer, microphone, lights, tripod)

Data & IT Equipment (to gather and bring to Clearinghouse when activated)

- 17 pre-loaded external emergency hard drives, 14 held by WGS members and 3 as spares
- 4 empty high-capacity external hard drives—Hard drives will be critical in a situation where the Clearinghouse has no Cloud access. The drives can also be used as on-site data backups.
- Laptops—Laptops with local installs of ArcGIS will be critical in a situation where there is no network connectivity.
- Tablets—Tablets to be kept at the Clearinghouse so that Data & IT committee staff can help troubleshoot and interact with field staff who may be working off a phone or tablet to collect data.

APPENDIX F: MEETING TEMPLATES AND SITUATION REPORT TEMPLATE

The following are example meeting templates that can be used to help facilitate activation and management of the Clearinghouse meetings as well as an example situation report template that can be used to send information to the EOC/EMD. These are only examples, please tailor the template to fit the needs of the meeting and committee.

Note: These templates use an earthquake as an example hazard event.

The calls and meetings that should happen after a potentially activating event include:

1. **Activation Call:** After the event happens or notice of event is received, the Clearinghouse hazard lead sets up an activation call (**Template 1**), if the decision is to activate, then move to the next steps.
2. **Core Partner Call:** Following the decision to activate, the Clearinghouse hazard chair(s) inform the core partners and sets up a call or email to notify the core partner group of Clearinghouse activation.
3. **Clearinghouse Planning Meeting:** The Clearinghouse hazard chair(s) will then hold a Clearinghouse planning meeting with WGS Clearinghouse committees and core partners (**Template 2**). Following this meeting, data collection efforts should begin.
4. **Evening Debrief Meeting:** Every evening after data is collected there will be an evening debrief meeting to summarize what data was collected and plan for the next day (**Template 3**).
5. **Situation Report:** Following the evening debrief meeting, the lead hazard committee chair(s) will work with core partners and the Outreach committee to develop a situation report to send to the emergency management partner(s) (**Template 4**).

The templates provided here are not considered comprehensive and are expected to be adapted and improved during a real event. At every meeting, a note taker should be designated, and meeting notes should be posted to the Clearinghouse webpage.

Template 1: Earthquake Activation Call Template

Introduction—what this call is for (“Deciding to activate Clearinghouse”)

- Description of the hazard event (There’s been an earthquake...)
- Introduce who called the meeting (WGS or other agency staff felt that we should discuss activation)
- Describe the purpose of this meeting: to decide if the Clearinghouse will activate, and if so, to determine the physical Clearinghouse location (such as the NRB)
- Ask that participants keep it brief: a planning meeting will happen next with more people, therefore discussion of smaller details should wait until that call

Roll call

For Video call:

- Put your name, agency and contact info in the chat.
- Notification of recording (if recording).

Phone call

- Each person give their name and agency.

Event details

- When
- Where
- Magnitude
- Depth
- Max MMI (if known)
- Pager status
- Any damage reports?

Activation discussion

- Are we going to activate?
- Clearinghouse location discussion
- Discussion of who we need to reach out to and who will do that (esp. our communications liaisons)
- Time/mode of planning call or meeting
- Review next steps and action items
- Send email summary of discussion

Template 2: WA All-Hazards Clearinghouse Planning Meeting Template

Overview

- The briefing will be led by the chair of the committee for the hazard being investigated (Lead Hazard committee chair) or a designated deputy. The chair deputizes a secretary to take notes or minutes (level of detail decided by the chair).

General Meeting Outline

- Welcome
- Meeting overview
- Roll call
- Event synopsis
- Discussion: Plan for teams—what will we do?
- Discussion: Mobilization details—how will we accomplish our goals?
- Review of day's priorities and team plans
- Safety reminders

Detailed Template

Note: Though the template looks highly prescribed, we may not need to cover every bullet point listed here or all the points mentioned—just want to give a sense of the sorts of things we could/should expect to discuss for each topic.

Pre-meeting:

- Generate *brief* outline on whiteboard so participants know when they'll discuss what. Potential outline:
 - Welcome
 - Meeting overview
 - Roll call
 - Event synopsis
 - Discussion: Plan for teams—*what will we do?*
 - Discussion: Mobilization details—*how will we accomplish our goals?*
 - Review of day's priorities and team plans
- Make sure people are signing in on paper near the room entrance or in the virtual chat.
- Logistics: generate and print local hospital info sheet for field teams

Call-to-Order

Lead hazard committee chair

- Welcome—meeting overview
- Reminder about signing in for this meeting
- Quick roll-call
- Event synopsis
 - Outline what leadership knows

- Ask for input from participants
- Plan for teams: what we will do
 - WHERE are the teams going?
 - Are there multiple Hazard sites or just one for now?
 - WHO are the field teams?
 - How many do we need?
 - WHAT data do the teams need to bring to the field to assist their work?
 - Print map copies
 - Emergency hard drives
 - WHEN are the teams departing the Clearinghouse?
 - Estimated time to leave
 - Estimated time to arrive at Hazard site
 - Where will the chair be?
- PAUSE: Ask who doesn't know what to do?
- Mobilization details: how we will do our work
 - Vehicles: who is traveling with who and with which vehicle(s)?
 - Gear: lists and needs
 - Field gear
 - List. Note Hazard specific items
 - Who needs equipment and how will we get it?
 - Data collection
 - Review forms (digital, paper)
 - Check that devices have software (Survey123, Avenza, Field Maps)
 - Sync forms BEFORE leaving Clearinghouse
 - Test offline (in Airplane Mode) BEFORE leaving Clearinghouse
 - Site Logistics
 - Whose land is it? (Must be researched by WGS employees and given to Clearinghouse volunteers)
 - Do we have access and permission?
 - Start by looking at County parcels (more detailed with specific private info): *Note*: some sharing restrictions may apply (check with county)
 - If we need more help with access, we can ask the local emergency manager for assistance
 - How to get to the site (directions)
 - Site entry limitations (gates, keys, road status)
 - For multiple teams working at one site, discuss organizing both recon and detailed observation field teams upon arrival
 - Safety
 - Check-in/check-out procedure
 - Gear reminder (first aid kits, sunscreen, hard hats, visibility vests, etc.)
 - Where is the nearest hospital?
- Review plan
 - Each team review where they are going and with whom
 - PAUSE and ask for questions
- Safety and reminders before going to the field
 - Emphasize that field teams need to have safety discussions
 - Field teams check gear list
 - Download and test forms
 - Emphasize check-in/check-out procedure
- Announce when and where the next meeting will take place.

- Review any action items
- Send notes via email and save to appropriate location

Adjourn Clearinghouse planning meeting for teams to prepare and depart for the field

Template 3: WA All-Hazards Clearinghouse Evening Briefing Template

Overview

The briefing will be led by the chair of the committee for the hazard being investigated (lead hazard committee chair) or a designated deputy. The chair should deputize a secretary to take notes or minutes (level of detail decided by the chair). The lead hazard committee co-chair or a designated deputy will help summarize the next day’s priorities and actions during the meeting for presentation at the end of the meeting and will fill out the [Situation Report](#) to send to EMD and Incident Command (if applicable).

General Meeting Outline

- Welcome
- Meeting overview
- Event synopsis
- Discussion: observations/data (“successes”)
 - Each team reports the facts
- Discussion: processes/methods (“ways to improve”)
 - Each team need not report
 - Focus on problems and their solutions
- Review of next day’s priorities, actions, and efforts
- Safety reminders

Detailed Template

Note: Though the template looks highly prescribed, we may not need to cover every bullet point listed here or all the points mentioned—just want to give a sense of the sorts of things we could/should expect to discuss for each topic.

Pre-meeting:

Generate *brief* outline on whiteboard so participants know when they’ll discuss what.

Example outline:

- Welcome
- Meeting overview
- Event synopsis
- Discussion: observations/data (“successes”)
 - Each team reports the facts
- Discussion: processes/methods (“ways to improve”)
 - Each team need not report
 - Focus on problems and their solutions
- Review of next day’s priorities, actions, and efforts with safety reminders

Call-to-Order:

Lead hazard committee chair

- Quick Roll-Call

Welcome—meeting overview

- Mention of the virtual Clearinghouse webpage and location of the physical Clearinghouse
- Review agenda
- Reminder to keep report outs brief and concise and to avoid duplication of information—report data (stick to facts and results) and process (methods and ways to improve) in separate sections
- Briefing on any urgent updates

Introduction to the General Situation—event synopsis

- Event basics
 - Initiation date
 - Location
 - Other general details of importance or updates since last meeting
- Jurisdictions affected to date
 - Overview map of the area affected
 - Impact on people and structures (if known)

Summary of Clearinghouse activities to date

- Number of days Clearinghouse has been active
- Maps showing the area(s) of data collection so far
- General actions completed
- Current priorities
- Eventually: reports/webinars planned

Today's Updates on data collection (data/observations):

Lead hazard committee chair moderates

- Clearinghouse lead hazard committee chair: summary of today's priorities and activities
- Remote sensing committee report (in summary form)
 - Location(s) visited
 - General observations
 - Products created (if applicable)
 - Recommended next action(s) based on today's work
 - Questions and short conversation
- Each on-the-ground team reports results (in summary form—encourage succinct reports, but this part may take a while—it is a major part of the point of this meeting)
 - Location(s) visited
 - General observations
 - Recommended next action(s) based on today's work
 - Questions and short conversation
- Reports from partners—topics determined by those agencies—please mention any data/products of use to the Clearinghouse staff and participants
 - For example: USGS, PNSN, EMD, FEMA, Regional Emergency Management Operations Center, WSDOT, NOAA, other DNR Divisions
- Updates from others doing data analysis
 - Results
 - Products that may be of use to Clearinghouse staff and participants
 - Questions and conversation
- Outreach committee updates

- Communications of importance to everyone—who was briefed and nature of the briefing.
- New talking points, maps, props prepared that may be of use to Clearinghouse participants
- New resources/products that are being created by others that may be of use to Clearinghouse participants that were not mentioned above

Logistics and Planning (processes/methods):

Lead hazard committee chair moderates

- Let teams bring up potential problems, potentially including:
 - Access issues
 - Emergency Management update: hazard areas that should be avoided by everyone except emergency first responders
 - Any Safety concerns or important safety messages (ask group of anything safety related they want to share)
 - Close calls and safety tips
 - What went well and what could be done better as we move forward
- Data & IT committee updates
 - Feedback on data submission for field teams
 - Any in-the-moment procedural changes
- Logistics committee updates
 - Updates on equipment and facilities
- Updates from teams not yet deployed but may do so
 - Current plans
 - When they plan to deploy or what threshold will trigger their deployment
 - Discussion of logistical help needed

Wrap-up:

Lead hazard committee chair and co-chair

- Summary of tomorrow's priorities (what the chairs heard—can include discussion)
- Summary of tomorrow's actions and efforts (each team says where they are going and what they are doing)
- And (or) eventual discussion of Clearinghouse continuation (Needed? How long? How many people?)
 - At last meeting include instructions for continuing to submit data
 - And Clearinghouse participant survey (?)
- Any other new or old business that needs to be discussed?
- Remember to check out and in before/after field work.
- Review action items

Post-meeting:

- Situation Report
 - Meeting between Outreach committee and lead hazard committee chair (and others as needed) to discuss products to be made based on the day's data
- Send follow-up email with notes and action items

Template 4: Situation Report

1. Information cutoff: Date/Time:	2. Situation Report Initial <input type="checkbox"/> Update <input type="checkbox"/> Final <input type="checkbox"/>	3. Incident Number	4. Incident Name
5. Affected Jurisdictions	6. Type Incident	7. State EOC Activation Status:	
8. General Situation 			
9. Current Priorities 			
10. Confirmed Incident / Event Related Injuries <div style="text-align: center;">0</div>		11. Confirmed Incident / Event Related Deaths <div style="text-align: center;">0</div>	
12. Updates WGS USGS PNSN EERI EMD OTHER			
13. Remarks 			
14. Prepared by 			
15. Sent to 			