# Communicate the Quake – Instructor Manual

COMMUNICATE *THE* QUAKE

*This document is written to introduce and assist instructors in running the 'Communicate the Quake' role-play in their curricula.*

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**Last Updated:** **February 1, 2016**

*This project was supported by the Ako Aotearoa National Project Fund*

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**Table 1: Instruction Steps**

[1]This step is mandatory for new instructors, and can be skipped by instructors who have run the role-play before.

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|---|---|---|
| **Step 1** | Select your Theme[1]<br><br>**1.1 General Earthquake Hazards** (Appendix G Materials)<br><br>**1.2 Hazards and Emergency Management**<br><br>**1.3 Seismic Engineering**<br><br>**1.4 Tectonics**<br><br>**1.5 Make your own –** Use elements of several themes. | Things to Consider<br><br>- It's important to be aware of your students backgrounds, and the learning goals that you are trying to achieve in your class<br>- The 'Communicate the Quake' exercise is suited to students' academic level, discipline, and familiarity with earthquake science.<br><br>Timeline<br>Months prior |
| **Step 2** | Get familiar with the Role-play<br><br>**2.1 Review concepts and skills** your students will need (i.e., Table 2, Learning Goals, this document)<br><br>**2.2 Read this document** and **review** the Instructions given to Students (Appendix G1).<br><br>**2.3 Review the Exercise Timeline** (Appendix G2)**.** This document is for instructors only.<br><br>**2.4 Review** the **PowerPoint** (Appendix G3), and **Decide** on which **Part(s)** you will cover in your class.<br><br>**2.5 Download all the files needed**<br>All curricular documents (Appendix C & Appendix G) | Things to Consider<br><br>- Reviewing the curricula and logistics allows you to be prepared and organised<br>- If you are running the role-play for the first time, there is a lot of literature and background information to get familiar with.<br>- The more prepared that you (the instructor) are, the more your students will benefit from this learning experience.<br><br>Timeline<br>Months prior |

| | | |
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| **Step 3** | Confirm dates, times, location, help<br><br>**3.1 Book location & space & equipment –** Large space with computers and projector.<br><br>**3.2 Book date & time –** Running time is anywhere from 2-6 hours – depending on what you want.<br><br>**3.3 Book Staff –** Usually 2-4 other staff to help. (See Table 3, Instructor Roles) | Things to Consider<br><br>- The PowerPoint requires a projector, attached to one (instructor) computer.<br>- Google Earth is essential for the data component. Set-up and test this ahead of time.<br>- Need to schedule in pre-lab and lecture(s) into your curricular plan as well.<br><br>Timeline<br>4 weeks prior |
| **Step 4** | Assign Students to Roles<br><br>**4.1 Hand out** and collect the **Role Questionnaire** (Appendix C2)<br><br>**4.2 Review & Assign Roles -** Review the roles and team responsibilities (Table 4) and assign students to the right roles. Pay attention to leadership qualities.<br><br>**4.3 Post** the students **roles** and teams **online** (or in person)<br><br>**4.4 Post** the **Instructions** to students and **Bibliography** (Appendixes G1) online (or in person) for students to read prior to the Simulation. | Things to Consider<br><br>- The quality of the exercise is dependent on how prepared students are, and how much they relate to their role.<br>- Assigning students to the right roles can be difficult; it is easier if you know the personalities of the students.<br>- Mix genders and abilities.<br>- Be aware of students who are more/less confident speaking in front of their peers<br><br>Timeline<br>2-3 weeks prior |

| | | |
|---|---|---|
| **Step 5** | Give preparation exercises and lecture(s)<br><br>**5.1 Set Simulation Assessment Worth** – This will motivate students to prepare, participate and inform feedback and level of sophistication. (Assessments: Appendix C2)<br><br>**Preparation activities** ***(done prior to the Role-play)***<br>**5.2 Pre-readings** – Basics of each role, protocols and expertise (See Bibliography; Appendixes G1 and full reading files: Appendix C6)<br><br>**5.3 Greymouth Risk mapping Exercise** (i.e., Lab, Homework or Interactive Lecture) (Appendix C3)<br><br>**5.4 Earthquake Lecture**(s) – Overview of earthquake science and emergency management concepts (Appendix C4)<br><br>**5.5 Science Communication Lecture** (Appendix C5) – Overview of the best practices of science communication | Things to Consider<br><br>- Decide on how much the role-play will be worth (typically 5-15% of a course grade).<br>- The quality of the students' abilities during the role-play is dependent on how prepared they are.<br>- If your course doesn't cover the topics needed, the students will struggle to perform well.<br>- Some modules/courses will require these activities, but others will not (See Table 5 for ideal use)<br>- The more you do prior to the role-play, the more sophisticated the level of discussion and communications you will see.<br><br>Timeline<br>2-3 weeks prior |
| **Step 6** | Preparing for the day of Simulation:<br><br>**6.1 Print out** paperwork needed (Table 6; for list of paperwork)<br><br>**6.2 Play** with the Google Earth files and PowerPoint on your work computer and become familiar with them (Appendix C7 for step-by-step instructions). Organise a file sharing system which allows you to share files with students in real time, and allows them to write files, together, in real time.<br><br>**6.3 Organise beverages and food** - Remind students to bring their own lunch or provide food for them. | Things to Consider<br><br>- The amount of paperwork that is needed to be printed will depend on the numbers of students you have.<br>- Run through the exercise timeline yourself and with staff if time-available.<br>- We like to complete the exercise with a BBQ.<br><br>Timeline<br>1 week prior |

| | | |
|---|---|---|
| **Step 7** | Day of the Simulation:<br><br>**7.1 Download Google Earth files** (Appendix G4)<br><br>**7.2 Set-up Document Sharing.** It is useful to practise using document sharing ahead of the day.<br><br>**7.3 Load the PowerPoint** (Appendixes G3)<br><br>**7.4 Begin Role-play**<br><br>**7.5 Review the Instructions with the Students** and introduce all the students and all the experts to one another.<br><br>**7.6 Drag and Drop files**<br><br>**7.7 Give Guidance When Needed** | Things to Consider<br><br>- Copying files can take some time depending on the computers you are running the files on.<br>- Review the PowerPoint and decide on which Parts you are running.<br>- Practice file sharing ahead of the day.<br>- One computer needs to run the PowerPoint, and should be projected so that students can view it.<br>- Students may become quite fatigued. Be sure to pause if students are becoming tired. |
| **Step 8** | After the Role-play:<br><br>**8.1 Debrief –** If you want to have students review and think about the role-play, have them do Part 4.<br><br>**8.2 Grading of the Role-play** - Hand-out the Overall Performance Rubrics to the students after it is over (Appendix C2)<br><br>**8.2 Collate Grades, and Collect Feedback** | Things to Consider<br><br>- Any feedback you receive will help with the following year.<br>- Send us feedback that you think will improve the Role-play |

## Step 1. Pick a Theme

Select the theme that best suits your students, curricula, and course learning goals. The role-play is designed for a class size of 10-40 students. We have developed the role-play to suite several different groups of students. Each theme is matched to the students' expertise and background knowledge. This manual describes the basic use of the role-play to teach students who have little prior knowledge of earthquake geology and hazards. Further information on additional themes can be accessed by contacting the curriculum developer.

### 1.1 General Earthquake Hazards

The General Earthquake Hazards theme is suited to students who may have little to no experience with earthquake science. This version is good for providing an overview of earthquake events, the scientists and emergency manager's roles, and focus on communicating during these events. Students may be of any academic background and level (ranging from 200-level and up) (Appendix G).

### 1.2 Hazards and Emergency Management

The Hazards and Emergency Management theme is suited to students who specialise in the emergency management and response to natural hazards (typically 300-level students). There is

less focus on earthquake science, and more on the interaction and communication between emergency managers and scientists, and to the public. Some students may have no experience in geology (Available through contact with the first authors).

### 1.3 Seismic Engineering

The Seismic Engineering theme is suited to engineering students (300-level or beyond). During the role-play, the focus will be on how earthquakes effect the built environment and the roles that engineers have during these events. It is preferred if some students have expertise in geology and earthquake science so that they might lead the communication around the geologic phenomena (Available through contact with the first authors).

### 1.4 Tectonics

The Tectonics theme is suited to students with advanced knowledge of earthquake science (300-level or beyond). This scenario asks students to provide full coverage of the earthquake(s), predicting the impacts and explaining the mechanics of these events. The focus of this version is on explaining earthquake science and less about the response to the event (Available through contact with the first authors).

### 1.5 Make your own

If none of these is specifically matched to your students, please consider going through the PowerPoint included in Appendixes G1 to see which exercises, questions, and content best works for you.

## Step 2. Get familiar with the role-play

### 2.1 Review concepts, skills and Learning Goals

The Communicate the Quake role-play is a challenging learning experience. Students require specific skills and knowledge prior to playing (Table 2A, next page). If your students do not have these basic skills and concepts, please use preparation activities to prepare them (See Step 5 of Table 1). After the simulation, your students should have achieved several higher-order learning goals (Table 2B, next page). It is common that instructors misinterpret the **main objectives of the exercise**. The objective is not to have the role-play run perfectly, or for your students to behave exactly as the professionals would - It is for your students to learn about the ways that an earthquake event is understood and communicated.

### 2.2 Review Instructions

This document and the Instructions for Students documents (Appendixes G1) are both excellent for understanding the 'rules' of the role-play, and the preparation documents and activities that need to be carried out prior to the exercise day.

### 2.3 Review the Exercise Timeline

The exercise timeline is essentially the "answers" to what happens during the role-play (Appendixes G2). **This document is for instructors and facilitators only.** It includes the earthquake events, the information given to students, the tasks required of the students, and the timing for each activity.

### 2.4 Review the PowerPoint and decide on your preferred format

The PowerPoint (which guides the role-play) has several Parts. These are designed, linearly to run through several important stages of an earthquake event – but: you may decide to run all,

or some of these, depending on the time that you have, and the goals of your course. You must decide if you would like to run all Parts (1-4), or whether you would like to run only some. A full exercise Parts 1-4, can take up to 6 hours to run, while Part 2 and 3 can run around 2 hours if you provide guidance. The timing depends on how much you would like students to respond, and how prepared they are.

**Part 1** is concerned with earthquake **preparedness** of the community **prior** to an event. It is a **Townhall meeting**, and is a successful ice breaker and introduction to the role-play (if students are unfamiliar or shy).

**Part 2** is immediately after a large quake, which causes damage. This Part is focused on **information needs** and **first response.** It includes media releases, infographics and press conferences. It should be fast-paced, and can be improvised/guided as needed.

**Part 3** is a **Panel Discussion**, where experts are called upon to **discuss the uncertainty of earthquakes**, and address the public's concerns. This section addresses the common misconceptions held by the public, in earthquake science and science in general.

**Part 4** is a post-exercise **Debrief**. Students are asked to think about what happened that day, and how they feel it went. You may choose to run this as a discussion, or as a written assignment. It is designed (by default) as a written assignment. This can be used on the day, or in the days/weeks following as a homework exercise.

### 2.5 Download and review all the files needed

All of the documents needed for this role-play will be included in Appendix G and Appendix C. Both folders are crucial for running the exercise.

Navigate through the folders (as you read this document), so that you are familiar with file structure, and where each element is stored.

Digital Files are stored in their respective folders (Appendixes G4). The files are essentially the same, but are stored within the theme for easier uploading. Download the Digital files and review them yourself. Additionally, you can review how these files were made, and where they came from (Appendix C7)

**Table 2: Learning Goals of the Simulation**

| | |
|---|---|
| **A.** | **Prior to the role-play, students should be familiar with….** |
| 1. | The variety of hazards and scale of damage caused by earthquakes. |
| 2. | Reading and understanding geological and topographical maps. |
| 3. | How, why, and where earthquakes occur. |
| 4. | A general idea of what the scientists and emergency management professionals do during a crisis. |
| **B.** | **After the simulation, students should be able to…** |
| 1. | **Summarise** and **communicate** (in plain speak) the characteristics (magnitude, depth, frequency, energy release) of a given earthquake event. |
| 2. | **Estimate** and **illustrate** impacts from an earthquake event based on the earthquake characteristics in order to create maps and infographics to effectively communicate with impacts public. |
| 3. | Have an awareness of scientist's and emergency manager's responsibilities, agendas, and expertise; Team structures. hierarchy and protocols; |
| 4. | **Compose** and **deliver** multiple formats of communications: town-hall/community meetings, media releases and bulletins, web-based communications, headlines for media, press conferences. |
| 5. | **Communicate** the scientific uncertainties associated with an ongoing earthquake event. (For example, answers to question like: "what happens next?"; "when will the next earthquake occur?"; "how certain are you that this event will not get 'bigger'?"). |
| 6. | **Describe** and **communicate** impacts to infrastructure and society from a large earthquake near Greymouth NZ. |
| 7. | **Have an awareness** of audience information needs. **Prioritise** pieces of information to specific situations and audiences. **Communicate** earthquake event information specific to multiple stakeholders (i.e., homeowners, industry sectors, affected communities, scientific community). |
| 8. | **Communicate** effectively in all scenarios. Criteria for effectiveness includes information which is organised, accurate, relevant, readily understood (including the message and the use of jargon) and delivery which is competent (i.e., appears approachable and comfortable with communicating) and culturally inclusive. |

## Step 3. Confirm Dates, Times, Location & Staff

### 3.1 Book Location & Space & Equipment

The space that the students work in is important for running a successful role-play. The preferred setting is: a large (lab or open room) space, with desktop room (for writing, and looking at maps) and PC or Mac computers. You may ask your students to bring their own laptops as well. Google Earth is crucial and must be installed ahead of time. If students are bringing their own laptops, you will need to send them the Greymouth Google Earth files (Appendixes G4), have them download it, and familiar with these files prior to the day (See Step 4.4).

### 3.2 Book Date & Time

The role-play is made up of 4 parts (previously discussed, above). The entire role-play may run for ~6 hours but they can run longer if the students need more time to do the necessary tasks. Typically, an hour preparation for you and the staff is also good to schedule in (to make sure that the computers run the program properly, and the paperwork and space is organised). Set

assessment worth, and include this information in your course outline (See Step 5.1 for more information)

### 3.3 Book Staff

The exercise runs best when several postgraduates and staff members help out. Instructors have the expertise necessary to think through the complex tasks smoothly, and provide students with assistance. At a minimum having three staff (total) allows one person to work with the Emergency Management team, one with the Science team, and one facilitates (who controls the powerpoint and files, monitors the time and pushes the class forward). Other roles are great for creating a more authentic experience (See Table 3) and if necessary some roles can be doubled up or expanded.

**Table 3: Instructor Roles**

| Role | Responsibilities |
|---|---|
| **The Facilitator** | Follows the earthquake event timeline, improvises and responds to the both teams requests, helps keep time and the role-play running smoothly. |
| **Emergency Management Specialist** | Oversees, assists, and challenges the Emergency Management team. Should review local and national protocols which are specific to volcanic crises. May improvise data/decisions/actions to challenge students. |
| **Earthquake/Engineering Specialist** | Oversees, assists, and challenges the Science team. Should provide help with interpreting the earthquake data, and guiding decision-making and communication of science. May improvise data/decisions/actions to challenge students. |
| **Local Mayor** | Responds to concerns of social and economic welfare of the community. Helps weight in on issues around infrastructure and costs of damage, etc. |
| **Prime Minister** | Responds to concerns of social and economic welfare of New Zealand. Helps weight in on issues around long term impacts of an earthquake event. |
| **Public Information Director** | Gives assistance on providing accurate and useful written and oral communications. Critiques format, content, and tone of communications. |
| **Rogue Scientists/Engineers** | Inquires on science decisions. Can have extreme or appropriate reactions to science information (to challenge and to throw students off) |

## Step 4. Assign Students to Roles

### 4.1 Hand-out and Collect the Role Questionnaire

In order for students to be assigned to the right roles, we have them fill out a Role Questionnaire (Appendix C1). Distribute the questionnaires, and collect them. Can do this digitally, or in person. (Quicker, in person).

### 4.2 Review & Assign Roles

You may choose to run an exercise that is 'one-sided', and focus on the emergency management (Hazards and Emergency Management Version) or scientific principles (Tectonics or Engineering Versions) or run it with both teams (General Version). See Table 4 for a list of all the roles that can be played in the exercise. There are several important roles that can make, or break the success of the role-play: The team leaders (Group Controller, Chief Science Advisor, and Duty Manager(s)), the Public Information Officers, and the Seismologist. Refer to the role

descriptions within the Bibliography for your theme (Appendixes G1) and match the skills and attributes (*self-reported in the Role Questionnaire*) to the students. Depending on class size, you may double-up, or remove roles.

The Role Questionnaire (Appendix C1) asks the students a series of questions. Section 1-5 is demographic information. Things to consider include: geology background (i.e., year of study), age, and gender. Students at higher levels of study will presumably have more geologic expertise. These students can be placed in important roles. Students who are older may also have more life experience, which can make for better leadership and teamwork qualities. To keep the teams balanced, it is good to have a mix of female and male members in each team. Section 6 asks students about their behaviour and abilities. Students who are generally more confident in their teamwork and communication skills will have mostly "agree" statements. These students should be matched to leader roles. The Science team requires students to be more quantitative, so Section 6 question 8 is more important for those roles. As this role-play is concerned predominantly with communication, pay attention to question 2 and 7 of part 6. Also, note that Section 5 is relevant to students who are ESL. Traditionally, most ESL students are not as comfortable speaking in front of their peers, however use your judgement on this variable. Section 7 asks students about their favourite and least favourite geology topics. For motivational reasons, it is good to match students ***likes*** (e.g., a student who enjoys seismology, should be placed in the seismologist role).

**4.3 Post the Roles Online**

Once all the students have been assigned to roles and team, post these online so that students can begin preparing for the role-play.

**4.4 Post the Instructions & Bibliography and Digital Files Online**

To get students prepared for the simulation, post the Bibliography and the Instructions to Students (both documents are in Appendix G1) online. Give students adequate time to read the materials (more than 9 days). There are digital Google Earth files that are built to familiarise the students with Greymouth, its infrastructure and the geology of the area. These should also be uploaded and shared online (Appendix G4).

**Table 4: Students Roles**

## Science Advisory Group

| Role | Responsibilities |
|---|---|
| **Chief Science Advisor (Team Leader)** | To lead, direct and coordinate the **science advice** during an earthquake. Coordinates effort to understand the earthquake sequence, the hazards and the risks of the event. Expert on earthquake sequences (and specific case studies, noted below) and communicating science advise during a crisis. |
| **Duty Manager** | Coordinates and organises the SAG Team, assists Chief Science Advisor to carry out tasks. **Monitors who is doing what task** (make sure that the right roles are doing the right jobs; e.g., The seismologist must lead the effort to understand the why/where earthquake has occurred). **Primary liaison between teams.** Receives incoming information from CDEM and delegates tasks. |
| **GNS Seismologist** | Monitors GNS's seismic network. Deploys instruments and interprets the scale of the event from the incoming parameters. Expert on how earthquakes "work". Given the current seismic activity, this specialist will be able to create forecasts on the likelihood of the future seismicity. Expert on **forecasting** (and the difference between forecasts and prediction). Expect on earthquake sequence case studies. |
| **GNS Field Team** | Given the current seismic activity, this specialist will be able to create forecasts on the likelihood of the future seismicity. Expert on **forecasting** (and the difference between forecasts and prediction). Expert on earthquake sequence case studies. |
| **Earthquake Engineer** | Specialists on earthquake engineering. This includes building properties, structural engineering, soil mechanics and foundations. Can advise on what buildings in an area may be earthquake prone (i.e., could collapse during an earthquake), and provide suggestions to city council on ways to mitigate these effects. |
| **Landslide Specialist** | Specialist in the physics and impacts of landslides. This includes knowledge on the types of landslides which may cause harm to citizens and blocking of infrastructure. Can advise on what parts of an area are landslide prone, and make suggestions on how to mitigate against impacts. |
| **Liquefaction Specialist** | Specialist in the physics and impacts of liquefaction. Can advise on what parts of an area are liquefaction prone, and make suggestions on how to mitigate against impacts. |
| **Public Information Officer** | Heads the effort when writing media releases to the public concerning event advice (what to do, what to be prepared for...). Liaises with SAG Team, and gathers incoming information. Media Releases should be ***timely, concise*** and ***considered***. |

## Civil Defence and Emergency Management (CDEM)

| Role | Responsibilities |
|---|---|
| Group Controller (Team Leader) | To lead, direct and coordinate the emergency response. Primary decision-maker. Expert on decision-making and leading a multi-disciplinary effort to manage a crisis. Also, expert in communicating these decisions to the public. |
| Duty Manager | Coordinates and organises the EM Team, assists Group Controller to carry out tasks. **Monitors who is doing what task** (make sure that the right roles are doing the right jobs; e.g., The welfare manager must lead the welfare shelter decisions). **Primary liaison between teams.** Receives incoming information from SAG and delegates tasks. |
| Infrastructure Coordinator | Primarily in charge of the status, mitigation and repair of roads, water (waste and drinking), shipping, rail, and airports. Works with Planning and Management on roads and on evacuation routes. Works with SAG on receiving science advise on how best to prepare for, and respond to earthquake damaged lifelines. |
| Planning Manager | Primarily concerned with infrastructure, evacuation, and welfare efforts. Focus on status of major road networks, supplies, and welfare. If evacuations are needed, Planning and Management lead this effort. Organising and planning the essentials of life for people affected by an event: evacuation centres, etc. |
| Welfare Officer | Primarily concerned with infrastructure, evacuation, and welfare efforts. Focus on status of major road networks, supplies, and welfare. If evacuations are needed, Planning and Management lead this effort. Organising and planning the essentials of life for people affected by an event: evacuation centres, Salvation Army, etc. |
| Human and Society Impacts Specialist | Specialises on how earthquakes affect humans (health, sociological, and community-related). Liases with CDEM to assess impacts to human health. Works with CDEM on evacuations and welfare centres. Makes recommendations on ways to reduce trauma and promote resilience. Also, and expert on the phenomena of pseudoscience (and its place in a disaster context). |
| Economic Impacts Specialist | Provides CDEM with advice on how earthquakes impact the local and national economy. All major damages incurred by each event should be considered (cost, short term and long term). Long term impacts – relocation of people, insurance, tourism, etc. Should be considered. |
| Public Information Officer | Heads the effort when writing media releases to the public concerning event advice (what to do, what to be prepared for...). Liaises with SAG Team, and gathers incoming information. Media Releases should be ***timely, concise*** and ***considered***. |

## Step 5. Give preparation exercises and lecture(s)

At a minimum, students should be familiar with their roles (Step 5.2) and earthquake science (Step 5.4). An ideal schedule of preparation activities (Table 5).

**Table 5: Ideal Use of curricula (curriculum plan)**

| Timing | Activity |
|---|---|
| Start of Semester | Set assessment worth, and include earthquake science and science communication activities (below) into your curriculum plan. |
| Months before | Get familiar with all role-play materials and activities; Book facilities, etc. |
| 2-3 weeks before | Send out Role Questionnaire to students |
| 2 wks – final week before | Review earthquake science (Earthquake Lectures) |
| 2 wks – final week before | Receive last of the student Role Questionnaires back, assign roles, post instructions and other information online (At least 9 days before exercise), so that students can begin to research their roles |
| 1 week before | Greymouth Risk Mapping Exercise |
| 1 week before/ days before | Science Communication Lecture + Homework |
| During and after exercise | Provide written and verbal feedback to students on their performance (use assessment rubrics) |

### 5.1 Set the Assessment Amount

In order to get students prepared for the role-play, you should assign grades so that you can motivate students to participate. Typically, instructors assign 10-15% for the exercise including preparation activities (with 5% going towards preparation or post-role-play activities). **Set the simulation assessment worth in your course outline** at the beginning of the semester.

There are several ways to assess the students (Appendix C2) before, during and after the role-play. Because public speaking is stressful for students, these assessments act as motivation to prepare for the role-play, all of which enhance the experience (students' abilities, confidence, accountability, and level of sophistication). These assessments can be modified for the customised communication tasks of choice (e.g., the Townhall Brief could be viewed through the media release lens, or the Panel Discussion could be viewed through the Press conference lens).

- Pre-reading summaries* (Prior to role-play)
- Media release (During role-play)
- Press conference performance (During role-play)
- Overall performance* (Immediately following role-play)

*Most commonly used.

The overall performance rubric is best used as a self- and peer-evaluation tool. Ask students to fill out one of the rubrics for themselves, and for someone sitting near to them.

*Preparation Activities*

**5.2 Pre-readings (a.k.a., Bibliography)**
Each role within the role-play has specific responsibilities and expertise. The students should read about the science and protocols of their roles using the Bibliography (Appendixes G1). If time allows, we recommend that pre-readings are given a portion of the assessment by each student in the teams being required to do a publication summary of one or more papers (Appendix C2). As the instructor, all you have to do is post the Bibliography online, and tell students they must do the readings prior to the role-play. If want to work offline, you can download Appendix C6 and print out individual copies of all the papers. **Note**: There are many readings in the Bibliography, so we usually don't expect students to have read all of the information in great detail.

**5.3 Greymouth Risk Mapping Activity**
So that students might familiarise themselves with the geology, infrastructure of the local area we recommend setting your students to do a hazards mapping learning exercise (Appendix C3). Google Earth files of Greymouth are used for this activity, which allows students to play and navigate them, prior to the role-play. If time allows, this activity is very effective at preparing students for the role-play and improving efficiency, on the day. Materials needed for the exercise are included in the folder.

**5.4 Earthquakes Lecture(s)**
If the role-play is a standalone activity, within a field course or another short module, you must make sure that all of the participants are familiar with earthquake science and basics of emergency management in New Zealand. These lectures (Appendix C4; Part 1 and Part 2) have been used, during a module suited to the General Hazards theme.

**5.5 Science Communication Lecture**
Effective communication is key to success and is a central goal of the role-play. To provide communication best practices, you can deliver a lecture which covers the basics of communicating during an earthquake crisis (or other natural hazards events; See Appendix C5). The lecture also has a homework media release critique included within it, that we recommend if time allows. Critiquing a media release will help students think carefully about language and jargon-use during these events – which is critical for effective written and oral communication. If you do not have time for a lecture, simply assign the media release or video media interview critique, and provide a rubric, and best practices as a supplement (to help them know what the best practices are).

## Step 6. Preparing for the day of Role-play

**6.1 Review and Print out the Paperwork**
There are several important papers that can be printed for the role-play (Table 6). We have set up the curriculum to be dominantly computer-assisted (e.g., use of Google Earth and file sharing). Some items can be printed to avoid extensive use of the internet (E.g., in circumstances where the internet access is less reliable).

**Table 6: List of items that can be printed**

| Items | Copies |
|---|---|
| **Bibliography** (i.e., **List** of Readings, Roles, and Responsibilities)<br>**Readings** | 2 - 4<br>1 or 2 copies of each reading |
| **Instructions** to Students | 2 – 4 |
| Exercise **Timeline*** | N of instructors |
| Overall Performance **Rubric** | N of students x2 |
| **Maps** of Greymouth | 10 – 20 (A3) and/or<br>2 - 4 (A0) |

* Item that must be printed

### 6.2 Unpack the Google Earth files & File Sharing System

Unpack the Google Earth files on your computer and become familiar with them (Appendix C7 for step-by-step instructions). Decide on a file sharing system, which allows you to share documents with students (in real-time) and let's them write and share documents of their own, easily (Step 7.2, below)

### 6.3 Organise Food and Beverages

As the role-play typically runs for a half day, it is best to advise students to eat prior to the activity, and provide snacks or a BBQ during or at the end.

## Step 7. Day of the Simulation

**Tip**: Set-up the space, bring the files and paperwork at least 1 hour prior to running the role-play.

### 7.1 Unpack the Google Earth files *(prior to Role-play start)*

The students require Google Earth files of the Greymouth region to manipulate and analyse during the role-play. Download and unpack files on all computers, and make sure that they load up (can take ~1 hour). The data which is given *during* the role-play is also built into Google Earth. Practice loading these on the "instructor" computer.

### 7.2 Set-up document sharing *(prior to Role-play start)*

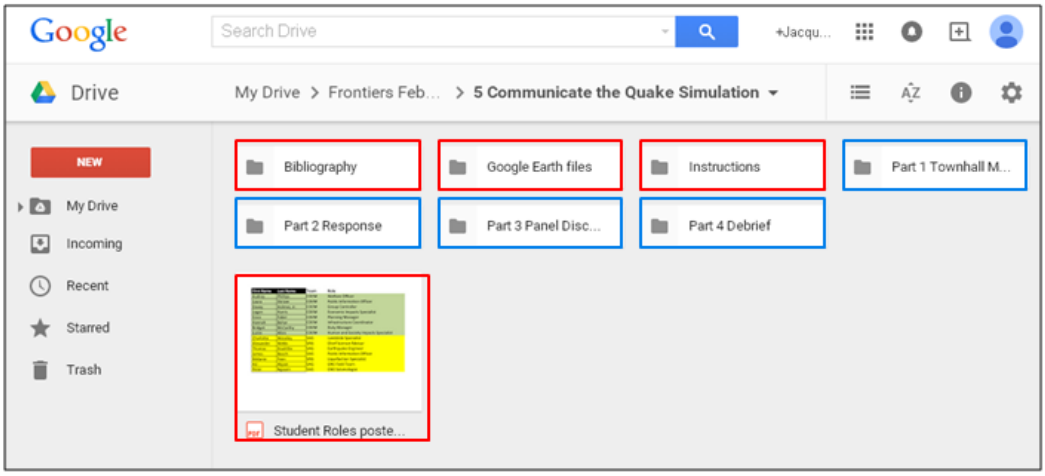
The exercise relies on the students and instructors using a file sharing programme to write and view updated documents.

**Sharing new documents**

During the exercise, the instructor will have the files which students must use to complete tasks (e.g., Part 1, Townhall Brief, or Part 3, Tweets). Students should not see these prior to the exercise (as that spoils the surprise). File sharing can be done in several platforms: Google Drive, Dropbox, or your Learning Management System (e.g., Moodle). You need an online site that can allow you to upload documents (in real time), and let students view them. Our version has a Google Drive account, that all students sign-into, and use together. The instructor then, 'drops' the files into the folders as you go through the exercise.

Slide 4 of the pptx file shows where the pre-loaded files are, and where you will make new ones. ** Change this slide when you decide what system you want to use **

**Go to the Google Drive App** 


**Sharing/uploading New files?: Rename them something obvious (e.g., Task 1 - CDEM Team - List)**

**<u>Writing new documents</u>**
Several of the tasks require students to write a jointly-composed document (e.g., a media release). Google Docs and other file sharing programmes allow you to write into/edit into the same document at the same time. Alternatively, students can work on separate word documents and then email each other what they have, to put it together. ** Students or participants with less familiarity with computers may struggle with this step. Don't expect all your participants to be computer-savvy. This is why we spend a little bit of time working on this at the start, before the tasks begin.

Students should be able to write their own new word documents, using the Google Docs function: In Google Drive, go to: "New" -> Google Doc. All the people with access to the Google Drive account should be able to edit and write into this document. Alternatively, if document security is an issue, one student user can open a new Google Doc, and share that (by adding the other student's emails) by invitation. This allows multiple users to write into one document.

**In a less-tech-saavy classroom:** Have one student open up a word document onto the computer with the projector attached to it. Then all students can talk aloud, and say what the student writing should put.

**Note**: If there are administrator rights on the computers, you should be sure to have the log in and password. Sometimes computers will not allow you to download or run new files without administrator permission.

**7.3 Load the PowerPoint onto Computer with Projector** *(prior to Role-play start)*
Load the PowerPoint onto an "instructor" computer which is connected to a projector that all the students can see. Once it is up and running, go through the slides to see the events unfold

and to review which parts (Part 1-4) you will be running. Additionally, there are timers which keep the group on task, practice playing with these.

**7.4 Begin Role-play**

**7.5 Review the Instructions with the Students** *(start of Role-play)*
It is good to begin the role-play by introducing the staff, the teams and the general "rules". With the students, refer to the PowerPoint (slides 3, 4) for the general rules.

**7.6 Drag and drop files**
During each part, the PowerPoint will tell you (the instructor; based on the colours of the text in the slides) and the students that new data is available. The instructor who is facilitating (i.e., guiding the PowerPoint, keeping time, etc.) should drag and drop the files, as they are called for. The files should show up in the file sharing program you are using, allowing student to view or download the new information.

**7.7 Give Guidance to Students When Needed**
The students may or may not have all the knowledge and skills that are needed to carry out the tasks. Instructors are asked to guide the teamwork, critical thinking, and decision-making and communication tasks. We did not set up the role-play to "fail", so it is advised that you follow along and step-in to provide helpful assistance when needed.

## Step 8. After the Role-play

**8.1 Debrief**
If you would like students to review the Role-play (what they think, how it can be improved, how it has changed their perspectives...), have them do Part 4 (on the day as a discussion, or afterwards as a written assignment).

**8.2 Grading the Students Performance**
Hand out the overall performance rubric (Appendix C2) to the students. Have them grade their own skills, and another student. Use these grades to assess their participation and behaviour during the role-play.

**8.3 Collate grades and Collect Feedback**
Collate the grades and send out an email or a short questionnaire that assesses how well the simulation went, and where students think you can improve. Some suggested questions include: What were your favourite aspects of today's role-play? What was your least favourite? What aspects of the role-play would you keep? What would you change?

# Appendix C – Curricula



## Appendix C1. Student Roles & Role Questionnaire

**Files**: Instructor Roles, Student Roles, and Role Questionnaire

## Appendix C2. Assessment

**Files**: Pre-reading summaries, Media release rubric, Press conference performance rubric, Overall performance rubric

## Appendix C3. Greymouth Risk Mapping Exercise

Risk Mapping Exercise is included as a word document. The materials that are needed (i.e., Google Earth files for Greymouth and the Bibliography) are included:

> Greymouth Risk Map Exercise word document
> **Materials Needed:** Bibliography (same as in other folders), Google Earth Files (same as in other folders), Basics about New Zealand & Greymouth, and Maps of Greymouth*.
>
> Maps of Greymouth should be printed out so that students can complete the risk map in hard copy. See file names for suggested printing.

## Appendix C4. Earthquake Lectures

Two PowerPoint presentations which walk students through earthquake science (Part 1) and impacts from earthquakes (Part 2).

## Appendix C5. Science Communication Lecture

A PowerPoint **presentation** about science communication is included in the preparation activities. Accompanying the lecture, are **handouts** (which can be used during the presentation), **videos** (that you can show during the presentation, with embedded links, within), and a **homework** assignment which asks students to write a critique of a media release.

## Appendix C6. Readings

Digital folder with all the readings (linked to within the Bibliography documents)

## Appendix C7. Google Earth Files

12 digital kmz files (i.e., Google Earth layers) were designed to illustrate the infrastructure, geology and geography of the Greymouth region. This allows students to view the region prior to the exercise, familiarise themselves and start to predict where the vulnerabilities (both physical and socio-political) lie. A zip file of the 12 layers is also included, for quick uploading/downloading.

To use the files:

1. Download and unzip (if necessary) the kmz files.
2. Open up Google Earth (url: https://www.google.com/earth/, to download)
3. Drag and drop one of the layers (e.g., EQSIM Census Data) onto Google Earth window
   Or: File -> Open (and then select the kmz file of your choice).

   Notes: Some of the kmz files are large, and they make take a little time to load up. If they commonly show up as an loading symbol  , you should check your disk cache. Go to: Tools -> Options "Cache" tab. Change the memory and disk cache to the maximum (This will be specific to your computer), and clear the previous caches.

We have also included a pdf file of the Google Earth File Design and Sources (a.k.a., how the files were made and sourced).

List of layers:

Building Properties & Amenities
Census Data
Digital Elevation Model
Dip and Aspect of Slopes
Drinking Water
Electricity
Land Cover
Liquefaction Potential
Regional Geology & Faults
Rivers and Lakes
Roads Networks
Sewerage

## Appendix G – General Earthquake Hazards-focused

A full copied version of each of the files is included in digital form.

### Appendix G1 – Instructions & Bibliography

This folder contains the student readings list (bibliography) and instructions to students prior to participating in the role-play.

### Appendix G2 - Exercise Timeline

This folder contains the "cheatsheet" for instructors which outlines what will happen on the day, the timing, the prompts and other useful information.

### Appendix G3 - Communicate the Quake PowerPoint

This folder contains the PowerPoint presentation which hosts the role-play.

### Appendix G4 – Digital Files

This folder contains all the files which are given to students prior to the role-play (for them to become familiar with Greymouth) and during the role-play ("the scenario" prompts, injects, and tasks).