ES100 Assignment: Cascadia Megaquake

“The Next Megaquake” was produced by the BBC in 2005. In the shadow of the Dec. 26 2004 Sumatra quake and tsunami (Boxing Day in the UK), it tells the story of the 1700 Cascadia event and describes the dynamics of the Cascadia subduction zone and the potential for a devastating event.

The program is linked on YouTube in 5 segments. I have linked the segments below with the time of each segment.

<table>
<thead>
<tr>
<th>Segment</th>
<th>Title</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Cascadian Megaquake 1 of 5</td>
<td>10:02</td>
</tr>
<tr>
<td>2.</td>
<td>Cascadian Megaquake 2 of 5</td>
<td>9:53</td>
</tr>
<tr>
<td>3.</td>
<td>Cascadian Megaquake 3 of 5</td>
<td>9:57</td>
</tr>
<tr>
<td>4.</td>
<td>Cascadian Megaquake 4 of 5</td>
<td>9:53</td>
</tr>
<tr>
<td>5.</td>
<td>Cascadian Megaquake 5 of 5</td>
<td>8:10</td>
</tr>
</tbody>
</table>

Answer the following questions (be neat and complete):

1. Why did geologists dismiss the risk of a megaquake in Cascadia?

2. Why did Brian Atwater start to look for evidence of the megaquake?

3. What evidence did Brian Atwater find? What type of deposit did the tsunami leave?

4. What did the records that Dr. Satake found tell him? What is an orphan tsunami?

5. What was the “ghost forest?” What types of evidence did the “ghost forest” provide?

6. What determines how large an earthquake will be?
7. The earthquake magnitude scale is \textit{logarithmic}. Each number on the scale indicates a ___-fold increase in displacement, but a _____-fold increase in ____________________________.

8. Who would be especially at risk from the tsunami? How does Seattle compare?

9. Compared to most earthquakes, what special characteristics would a M9 quake have?

10. What types of buildings are especially at risk?

11. Brian Atwater determined the record of the 4 previous Cascadia quakes. What were their dates?

12. Describe the hypothesized fault rupture of a Cascadia event. How long would the rupture take?

13. How fast do tsunami waves travel? _____________________________ How long would it take for tsunami waves to reach Hawaii _____ hours; Japan _____ hours? Pacific NW _____ hour?

14. The first earthquake wave would feel like: _____________________________

15. Which type of earthquake waves do the most damage? _____________________________; they will move the earth _____________________________ by as much as a meter.

16. What would the surface waves look like? _____________________________

17. What is the general advice about what to do when you feel an earthquake (inside and outside)?

18. What risks are present for buildings far inland?

19. How does the scale of a Cascadia event compare to “typical” earthquakes?