Tufts Crisis Mapping Class: Final Report

August 2011

EXP-0044-s-Crisis Mapping: Technology, Resources and Disaster Relief

A Tufts Experimental College course, with support from The Hitachi Center and The Institute for Global Leadership

Spring Semester 2011

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At A Glance

In response to the growing interest in the emerging field of crisis mapping, Roz Sewell and Jennifer Catalano developed the first introductory course teaching the use of crisis mapping in traditional disaster response. This report provides an overview of the course content, as well as feedback from the student evaluations, lessons learned and recommendations.

The design of the Tufts University crisis mapping class drew heavily from the success and lessons learned of the widely-recognized Ushahidi Haiti Project at Tufts. The class offered students an introduction to the basic technological and programmatic knowledge required to implement four of the most prominent new tools in the field of crisis mapping. Platforms covered include: Ushahidi and CrowdMap, Open Street Map, Google Maps, and Frontline SMS.

Students further put their learning to direct use through a day-long crisis simulation that was conducted in partnership with the Tufts Field Exercise for Peace and Stability Operations (FieldEx).

Class Overview (At a Glance)

- Instructors: Roz Sewell and Jennifer Catalano
- 20 students
- 6 classes taught
- Student Deliverables
  - 4 Blog Posts
  - 4 Lab Assignments
  - 2 Ignite-Style Presentations
- Mandatory Crisis Simulation in collaboration with Tufts FieldEx

The authors of this report recommend that Tufts continue to offer this course in future semesters as a one-credit lab course. In order to fully take advantage of Tufts’ geospatial expertise, it is recommended that the class be housed in the Tufts GIS Center.
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Executive Summary

In response to the growing interest in the emerging field of crisis mapping, Roz Sewell and Jennifer Catalano developed the first introductory course teaching the use of crisis mapping in traditional disaster response. The design of the Tufts University crisis mapping class drew heavily from the success and lessons learned of the widely-recognized Ushahidi Haiti Project at Tufts.

20 Students participated in the Crisis Mapping Class, representing a wide range of majors, nationalities, and years of study.

Co-instructors Roz Sewell and Jennifer Catalano were graduate students (MALD 2011) at The Fletcher School, and formerly integral members of the Ushahidi Haiti Project at Tufts. They taught the first and last lectures, organized and guided guest lecturers, facilitated discussion in all classes, graded all student assignments and guided students in their lab work.

Guest lecturers from the crisis mapping field taught classes two, three, four and five.

Course Design:

The course consisted of six lectures over the 13-week spring semester of 2011. The course emphasized theory and practice through using the example of a fictional earthquake in Morocco to help teach the tools. A mandatory capstone crisis simulation provided students with a chance to apply their learning in a hands-on situation.

- Class 1: Why Maps? An Introduction to Humanitarian Mapping in the Field
- Class 2: New Cartographers – Open Street Map
- Class 3: Deploying the Ushahidi Platform: Technical and Human Challenges
- Class 4: Google’s Geospatial Technologies – Google Maps and Google Earth
- Class 5: Crisis Mapping without Maps: Frontline SMS
- Class 6: Conclusions and Next Steps

Students completed four lab assignments (one for each crisis mapping tool), four blog posts, and two ignite-style (or “lightning talk”) presentations. The majority of these assignments were conducted in groups that remained constant throughout the semester. Each group simulated large humanitarian NGOs and other
prominent actors in disaster response. Students began by considering their organization’s proposed humanitarian response to a fictional crisis scenario, incorporating their understanding of the basic program design principles taught in the first class. Each team created an initial ‘action plan’ of their proposed response to the crisis. They then built on this action plan with each additional assignment, considering how the technology being studied could further their humanitarian goals, and highlighting specific challenges and opportunities to take into consideration.

**Crisis Simulation:**

On April 9, 2011, students in the Tufts Crisis Mapping class participated in an 8 hour crisis mapping simulation exercise in conjunction with the Tufts FieldEx crisis simulation. Students drew on the skills that they had learned in class to assess the simulated situation and execute an appropriate crisis mapping response.

In the course of the exercise, students:

- Received text messages from members of the FieldEX simulation
- Processed and geo-located each message
- Created a map of the simulation site on Open Street Map
- Set up a crisis map on CrowdMap.com
- Mapped each geo-located message
- Issued press releases
- Blogged and updated Twitter
- communicated with representatives in the field

The crisis simulation proved to be an essential piece of the course. During the simulation, students demonstrated understanding of multiple dimensions of real-world crisis mapping deployments, and a solid working-knowledge of the principle dynamics of the field. Student response to the simulation was overwhelmingly positive.

**Outcomes:**

Student feedback and evaluations indicated an overwhelmingly positive response to the course. Students strongly advocated for the course to be taught again, with a class format that would allow for greater time for group lab work and more substantial treatment of the readings.

The crisis simulation was evaluated by all involved to be an essential capstone element to the course. It provided students with their the crucial opportunity to coalesce and apply all that they had learned throughout the semester.
Students expressed interest in further study and work in the field. Since completing the class, students have found internships (2) and jobs (2) at the following organizations:

- Health Map
- Satellite Sentinel Project
- Geocommons
- International Organization for Migration

**Recommendations:**

1. Teach as a 1-credit course that meets every week.

   This will allow the appropriate amount of class time to cover all basic material, as well as provide students with credit compensation in proportion to the amount of work required. Add a mandatory lab period every other week, and include more time to discuss theory and readings.

2. House Future Crisis Mapping Courses at the Tufts GIS Center

   Situating this class at the GIS Center will benefit both the crisis mapping students and the broader spatial technology community at Tufts. The GIS Center has the expertise and physical lab resources to hold the class, and is best situated to facilitate the coordination of guest lecturers and additional resources. Holding class in a computer lab will be much more conducive to the interactive and technology driven learning of the course.

3. Add class sessions on GPS and GIS

   Providing students with a basic introduction to GIS and GPS will greatly enhance and round out the existing curriculum and fill several noted gaps in student knowledge. GPS training will further increase the range of skills students bring to future crisis mapping efforts. GIS training will allow students to become aware of the wider geo-spatial technology field, and point them in the direction of opportunities for further study.
Background

On January 12, 2011, an earthquake hit Haiti that caused destruction on a scale rarely before seen in the western hemisphere. In the days that followed, Tufts students began to comb the news, social networks, diaspora communities and personal contacts for information coming out of the disaster zone. Where possible, students identified the precise geographic location of each emerging report and posted it on a simple online map. The company that provided this service was Ushahidi, an open source online mapping platform developed in Kenya post the 2008 election violence. This innovative technology, combined with the drive and creativity of Tufts students, enabled the first large scale deployment of a citizen mapping platform in the world.

Haiti.ushahidi.com began to very quickly draw attention. Deployed just two hours after the earthquake struck, the map filled traditional information gaps that exist post disaster. Each report was processed in near real-time and categorized according to need, such as citizen news, food and water needs, or medical emergency. Responding humanitarian organizations monitored the site daily to augment their own information sources. The Tufts Ushahidi team also partnered with other traditional and innovative organizations to set-up a free SMS short-code – 4636 – within Haiti. Text messages from this number were then translated and sent to the new ‘expert mappers’ at Tufts to add locations and relay the information to responders. In the span of a week, a group of students at Tufts had shown the world how networked solutions to disaster can save lives. Overnight, Tufts University – already a leader in humanitarian and international affairs – also became one of the leading centers of crisis and participatory mapping.

The activities undertaken as part of the Ushahidi Haiti Project (UHP) represent only one aspect of the growing and increasingly diverse field of crisis mapping. The incredibly ambitious undertaking – and resounding success – of the crisis mapping efforts of the students at Tufts, opened a world of possibility. These efforts also unequivocally demonstrated the need for teams to be trained before a disaster strikes and for networks to be in place for preventative action. In response to this pressing need, two integral members of UHP designed this course in order to teach a new cadre of students and prepare them to create new solutions to traditional problems.

Course Structure:

The course consisted of six lectures over the 13-week spring semester of 2011. Co-instructors Roz Sewell and Jennifer Catalano taught the first and last lectures, organized and guided guest lecturers, and facilitated discussion in all classes. They also designed and graded all student assignments and guided students in their
lab work. The course emphasized theory and practice through using the example of a fictional earthquake in Morocco to help teach the tools. Guest lecturers from the crisis mapping field taught classes two, three, four and five. (See syllabus for more information). A mandatory capstone crisis simulation provided students with a chance to apply their learning in a hands-on situation.

- Class 1: Why Maps? An Introduction to Humanitarian Mapping in the Field
- Class 2: New Cartographers – Open Street Map
- Class 3: Deploying the Ushahidi Platform: Technical and Human Challenges
- Class 4: Google’s Geospatial Technologies – Google Maps and Google Earth
- Class 5: Crisis Mapping without Maps: Frontline SMS
- Class 6: Conclusions and Next Steps

Assignment Structure

Students completed four lab assignments (one for each crisis mapping tool), four blog posts, and two ignite-style (or “lightning talk”) presentations. The majority of these assignments were conducted in groups that remained constant throughout the semester. Each group simulated a large humanitarian NGO or other prominent actor in disaster response. Students began by considering their organization’s proposed humanitarian response to a fictional crisis scenario. Incorporating their understanding of the basic program design principles taught in the first class each team created an initial ‘action plan’ of their organization’s proposed response to the crisis. Students then built on this action plan with each additional assignment, considering how to leverage each technology being studied in order to further the specific programmatic goals they defined in their original ‘Action Plan’. They were also required to highlight specific assumptions, contextual considerations, challenges and opportunities to take into consideration. This allowed students to bring knowledge from other classes and their own life experiences.
Syllabus

EXP-0044-S – Crisis Mapping: Technology, Resources, and Disaster Relief
Course Syllabus
0.5 credit, Letter-graded, Call #04352
Tuesday, 6:30-9:00 PM, Eaton 203
http://tuftscrisismappingclass.com

Instructors
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Office Hours: 6:30 – 8 pm every Tuesday we don’t have class or by appointment

Course Description
Crisis mapping is an emerging interdisciplinary field that uses technology to aid in the response to humanitarian emergencies. After the January 12, 2010 earthquake in Haiti, the crisis mapping community and a network of students at Tufts University led the largest and most successful deployment of a crisis map to date.

Around the world, crisis mapping technologies are being applied to an increasingly wide range of scenarios, including the monitoring of elections and human rights abuses, citizen journalists mobilization, conflict tracking, and aid evaluation. As the world takes notice of the dramatic new possibilities opened up by these tools, there is a rapidly growing need for skilled professionals who understand both how to implement crisis mapping platforms in their work, and the broader implications of applying mapping technologies within various contexts of international social change. This course aims to teach students about the field and equip them with the skills to use the most important crisis mapping tools. The students will additionally become a part of a growing global network of skilled ‘crisis mappers’. 
EXP-0044-s-Crisis Mapping Technology, Resources and Disaster Relief

Course Goals

1) Technical Skills:

Students will learn how to deploy three key platforms for crisis response:

- Google Earth
- Ushahidi
- Frontline SMS
- Open Street Maps

They will be able to independently execute deployments of these three platforms for crisis response, and will know where to access technical support when necessary.

2) Program Skills and Best Practices:

In addition to gaining the technical skills required to deploy crisis mapping technologies during and before emergencies, students will understand the impetus behind the birth of the crisis mapping field. This includes understanding not only the realities of fieldwork, but also the ways in which humanitarians have been cataloging geographic information for decades. Students will receive a basic overview of relevant issues in:

- Field work
- Program design & management
- Principles of humanitarian action, especially in regards to disaster management

Students will be given a basic understanding of the above topics and will be encouraged to engage in further training and critical analysis of the role of crisis mapping in international social change.

3) Leveraging the Crisis Mapping Network:

As part of the course, students will join the major international online networks of crisis mappers. They will learn how to access information from the web of decentralized online resources, and will be required to contribute to field-wide learning through blog posts, twitter updates, and recorded ‘Ignite’ presentations.
**Reading Materials**

The reading for the course will be posted on the course wiki. Any copyrighted material will be made available via blackboard or placed on reserve at the Tisch library. Readings will be drawn from blogs, web sites and other unpublished sources of shared learning, as well as from formal publications and selected books.

Students will be expected to have all assigned reading completed before class. It is important that students complete all reading to facilitate class discussion. Supplementary material may be assigned, but will not be required.

**Expectations and Grading**

The primary goal of this course is to give students a set of concrete skills that allows them to enter confidently into the crisis mapping community. Therefore, each student is expected to do the readings, prepare the presentations, and complete the outside lab work. Each assignment and reading has been chosen to give the students both theoretical background and a practical application. Any uncompleted assignments will cause the student to go down one partial letter grade. In other words, if a student prepares every assignment except one, the highest possible grade he/she can receive in the course is an ‘A-.’

The students will be graded as follows:
- Blog Posts: 15%
- Class Participation: 10%
- Presentations: 20%
- Group Lab Work: 35%
- Final Simulation: 20%

**Assignments**

*Blog and Community Posts*

Although the field of crisis mapping emphasizes new technologies, the human connection is equally important. Blogs, Skype chats, twitter, and wikis form the principle methods of online, shared learning.

In order for students to understand and become a part of the crisis mappers network, each student will be required to blog throughout the course. This will also allow the broader crisis mapping community to engage with the work of the students. Each student will be required to
- Write at least one blog post for the class blog
- Join the Crisis Mappers Network online network
Blog posts will be graded based on their content, clarity of written thought, and pertinence to the broader community.

**Class Participation**
This course is designed to be a collaborative environment with students learning not only from the instructors and guest speakers, but also from each other. Students will be expected to participate in class discussion and come prepared to talk about the readings for the week.

**Presentations**
Within the technology community, short presentations have become the normal narrative style even for complex projects. One such format is called “Ignite.” The presenter is given 20 slides to discuss a topic, and each slide auto-advances every 15 sections. Each team will need to prepare Ignite-style presentations after the conclusion of their lab work. These presentations will be sent to the instructor no later than 4 pm before the day of class. A presentation schedule will be given during the first class.

Each group will also be required to give one longer 15-minute presentation at the conclusion of the semester focusing on the lessons learned from their team.

**Group Lab Work**
Each week the teams will be expected to use a given data set and tool in the context of the scenario given to them at the start of class. Each team will be responsible for a blog post detailing their successes and lessons learned from the exercise only on the weeks they are not presenting. Teams are welcome to write a blog post in addition to their Ignite presentation, but it is not required. The class presentations and blog posts will emphasize the limitations of the specific platform for the given scenario and the important things to consider when deploying such a tool. Students should also consider alternative strategies and ways to innovate on the existing use cases.

**Crisis Simulation**
In April (exact date will be determined based on class availability) after course 5, there will be a crisis simulation to test the students’ skills in the field. More details will be given mid-way through the semester, to include team assignments and preparations for the day. Participants in the simulation will include all members of this course, Fletcher students, and Crisis Mapping practitioners.
Class 1

Why Maps? An Introduction to Humanitarian Mapping in the Field
February 1, 2011 (updated: February 8, 2011 due to snow)
Guest Speaker: Sabina Carlson, via Skype

This class serves as an introduction to the field of humanitarian action and the use of crisis mapping. Course instructors will discuss the syllabus and expectations for the course. Sabina Carlson, employed with IOM Haiti, will discuss her experiences using mapping in the field and the benefits and challenges of new technologies.

Students will:

• Receive an overview of humanitarian mapping, crisis mapping, and field work
• Learn the basics of crisis mapping program design
• Receive assignments for thematic groups

In Class Work

The instructors placed each student into a different NGO or International Organization team. Students will be asked to review the scenario (Appendix 1) and consider the response priorities for your team given the nature of their organization. (Please see appendices 2 and 3 for the in-class and lab assignment).

Readings

• Blog: A Brief History of Crisis Mapping (Updated), Patrick Meier, 3/12/2009

Assignments Due

• Complete the introductory survey (Introductory Survey Questionnaire n.d.) emailed to you by noon on Tuesday, February 1.
• The Crisis Scenario (Appendix 1) will be sent out the day before, just look over it so that you’re prepared for the in-class exercise
Class 2

New Cartographers – Open Street Map
February 15, 2011
Guest Speaker: tbd
Presentation Groups: 1,2,3,4,5 (note these are informal presentations)
Group Blogs Due: none

Ultimately, any technology is only as useful as its relevance to the needs of the affected populations and responders in the field. One of the first things responders need is a physical map of the location. This class teaches students the basics of “filling in a map” using Open Street Map.

Students will:

• Discuss the response effort for the ‘crisis’ in a mock ‘cluster meeting’
• Gain exposure to the new cartography used with Open Street Map
• Learn the premise of editing Open Street Maps

In Class Work

Students will be required to present their preliminary action and assessment plan during class. The groups will be given 15 minutes to meet before the group leader briefs ROMENACA and the other teams. The presentation is meant to be informal but short, so no powerpoint or visual aids are needed.

After the presentations and discussion, the students will receive a short training on OSM. The goal is to understand the way participatory GIS is changing the mapping fields.

Readings

• Map Kibera Wiki:
  o “The Story of Map Kibera”
  o Skim two other wiki sections based on your interest

Assignments Due

• Sign up for the Crisis Mappers network, please ‘add’ Roz to show that you have done the assignment.
• Write one personal half page note for the class blog (please submit this blog under YOUR username, email Roz if you’re having trouble):
  o Why did you choose to take this class?
  o What do you want to get out of it?
• Review the crisis scenario, and prepare the memo detailed in Part I of the assignment for Class 1. This will be basis of your presentation in class.
Class 3

Deploying the Ushahidi Platform: Technical and Human Challenges
March 1, 2011
Guest Speaker: Rob Baker, Konpa Group and Small World News
Presentation Groups: none (to allow enough time for the training)
Blogs Due: CRS, MOH, RC, UNICEF, WFP

The Ushahidi platform has been used to create crisis maps in response to the 2008 election violence in Kenya, the January 2010 earthquake in Haiti, the 2010 Gulf Oil spill, and the 2010 floods in Pakistan. Teams will learn how to use this crisis map and will discuss the implications of ‘crowd sourcing’ disaster response.

Students will:
• Learn how to install and manage a Ushahidi platform. This includes the technical skills required to carry out a deployment.
• Receive an overview of all non-technical aspects of Ushahidi platform deployment, including:
  o Volunteer management
  o Communicating with crisis-affected populations
  o Creating an internal organizational structure
  o Liaising with humanitarian actors
  o Safety and ethics while crisis mapping with vulnerable populations

Readings
• Blog: If It Works in Africa, It Will Work Anywhere, Erik Hersman, 9/26/2008
• Video: Ushahidi, Juliana Rotich, 2010
• Article: Cybercasing the Joint: On the Privacy Implications of Geo-Tagging, Gerald Friedland & Robin Sommer, 2010

In Class Work

For the in-class exercise see Appendix 4

Assignments Due

• Due to the snow day, the previously planned assignment for this class was canceled.
• For next week, students are required to complete Part 2 of the Class 1 Lab Assignment (Appendix 3).

• Blog Posts (Due Saturday March 5)
  o All teams are required to submit a blog post (one per team):
    Write a short (1 – 1.5 page) team blog post with two parts. First, briefly describe your process and highlight challenges faced throughout the first assignment (the in-class and out of class portions one and two). Second, write a summary of your program design report that communicates your organization’s overall plan of action to the broader community (in the interest of increased transparency and coordination among aid agencies). Make sure to touch on the following questions:
    ▪ Who is your target population?
    ▪ What is your overall plan?
    ▪ What is your timeline?
    ▪ What organizations are you working with?
    ▪ How will you be monitoring progress?
    ▪ What additional resources will you need?
Class 4

Google’s Geospatial Technologies – Google Maps and Google Earth
March 15, 2011
Guest Speaker: Patrick Florence, Tufts GIS
Presentation Groups: CRS, Red Cross
Blogs Due: MoH, WFP, UNICEF

This class will introduce students to basic mapping and GIS vocabulary through the presentation of some of the most easily-accessible and useful open source mapping tools: Google Maps, Google Earth and Open Street Maps.

Students will:

• Learn how to navigate Google Earth and create KML files from GPS data sets.
• Learn how to choose from among the variety of available options for sharing geo-located data online.

Readings

Students should come prepared to discuss the importance (or unimportance) of data visualization for their respective scenarios.

• Briefing paper: “Google Earth and its potential in the humanitarian sector,” Map Action, April 2008
• One additional reading will be posted by March 8th.

Assignments

Students are required to create a crowd map using the dataset emailed to them on Tuesday. Please see the assignment write-up (Appendix 5) for detailed instructions.
Class 5

Crisis Mapping without Maps: Frontline SMS
April 5, 2011
Guest Speaker: Adam White, GroupShot
Group Presentations: UNICEF, MoH, WFP
Group Blogs Due: RC, CRS

Throughout the world, even where significant barriers of access to technology remain, mobile phones are transforming the way people connect to the world. Frontline SMS is an easy-to-use platform that “turns a laptop and a mobile phone into a communication hub.” In this class, students will learn how to set this platform up in addition to learning the benefits of using SMS technology.

Students will:

- Learn to set up Frontline SMS instance (stand alone)
- Learn to integrate Frontline SMS with Ushahidi
- Discuss program considerations of a Frontline SMS Deployment, such as:
  - Deciding when to use Frontline SMS instead of a mapping platform
  - Safety and ethics
  - Integrating Frontline SMS with other appropriate technologies and program goals

Readings

- Video: Erik Hersman on Reporting Crisis Through Texting, Erik Hersman, 2009

Assignments Due (midnight on 4/8)

- Teams will be required to create a KML file from the SMS data they received and customize the visualization. The goal is to facilitate information sharing among the other organizations.
Teams will explain the benefits/limitations of their map in either a presentation and blog post. Please see the list above for which teams are presenting and which are blogging. Questions to think about:

- Why is data visualization necessary? And what are other ways the data could have been presented?
- What was the target audience for this information?
- For full assignment, see appendix 6.
Class 6

Conclusions and Next Steps
April 19, 2011 Guest Speaker: Crisis Mappers panel
Group Presentations: all
Group Blogs Due: all

This class will offer students a chance to reflect on their experiences in the course, ask questions of experienced members of the crisis mapping field, and share ideas for how they will use crisis mapping in their future careers.

Students will:

- Make a 5-minute llgnite-style presentation (in groups) about their experience during the simulation. Each team will have an additional 3 – 5 minutes for questions and discussion.
- Break into working group discussions with class members and Crisis Mapping guests to discuss their new understanding of crisis mapping tools and techniques

Frontline Assignment Due April 8

- Using the techniques discussed in class, think through a work flow in which you could use FrontlineSMS for your organization

- Write out this work flow briefly using any format you choose (bullets, paragraph, workflow, etc.)
  - Questions to consider:
    - What assumptions are you making?
    - What are considerations you need to make?
    - How can this go wrong?
    - Please don’t forget to work through the process needed as well as what you are asking of your reporting population
    - Please email this to Roz and Jennifer by midnight on Friday, April 8. This is an individual assignment (but you can consult your group.)

Assignments Due April 19th
Blog Post: In your NGO teams, return to your original program design. Thinking about everything you have learned this semester, how would you change your original plans? What would you do differently? Where would you incorporate the technologies we have been learning about? What do you expect the implications of this to be – both for your program, and for the overall situation in which you are operating? Due April 19th at 5:00.

Presentation:

In your crisis simulation teams, prepare a 5-minute IIgnite-style presentation about your experience during the simulation.

What did you do? What problems or challenges did you face? What worked well? What do you think your successes were? What difference do you think your presence made to unfolding of the crisis? Think of both positive and negative possible effects. What did you learn? What would you do differently next time? What recommendations would you give to the broader crisis mapping community? (give 3 to 5 recommendations).
Crisis Simulation

On April 9, 2011, students in the Tufts Crisis Mapping class participated in an 8-hour crisis mapping simulation exercise in conjunction with the Tufts FieldEx Crisis simulation. Students drew on the skills that they had learned in class to assess the simulated situation and execute an appropriate crisis mapping response.

In the course of the exercise, students:

- Received text messages from members of the FieldEX simulation
- Processed and geo-located each message
- Created a map of the simulation site on Open Street Map
- Set up a crisis map on CrowdMap.com
- Mapped each geo-located message
- Issued press releases
- Blogged and updated Twitter
- Communicated with representatives in the field

The crisis simulation proved to be an essential piece of the course. During the simulation, students demonstrated understanding of multiple dimensions of real-world crisis mapping deployments, and a solid working knowledge of the field. Student response to the simulation was overwhelmingly positive.

Please see Appendix 7 for a full description of the crisis scenario and the crisis mapping role.
Lessons Learned

Brief evaluations were conducted via Survey Monkey following each class session. Each evaluation asked the following questions:

- Was the material presented during class clear?
- What was one thing that could be improved?
- What did you learn?
- Is there anything you want to add?

Class 1

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<thead>
<tr>
<th>Summary of Student Feedback</th>
<th>Key Lessons Learned</th>
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<tbody>
<tr>
<td>• The poor quality of the Skype connection to Sabina severely limited the utility of her lecture</td>
<td>• Guest lecturers via Skype are not recommended, due to potential of significant technological difficulties</td>
</tr>
<tr>
<td>• Positive feedback on section on basic program design and history of humanitarian aid</td>
<td>• Providing students with a basic background in program design and humanitarian aid gives students a base on which to build future discussions of technology and aid</td>
</tr>
<tr>
<td>• Too much material to fit into a single class period</td>
<td>• A longer class period is recommended to allow time for material to be covered more thoroughly. See Recommendations Section.</td>
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Class 2

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<tr>
<th>Summary of Student Feedback</th>
<th>Key Lessons Learned</th>
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</thead>
<tbody>
<tr>
<td>• Students learned basic tenets of Open Street Map, but many felt that they continued to lack a clear understanding of specifically how to use the platform</td>
<td>• It is important to provide guest lecturers (particularly those new to teaching) with very specific guidelines for presentation content, length and style</td>
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<tr>
<td>• Students expressed interest in having more time for hands-on practice</td>
<td>• Providing time for in-class practice is important</td>
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Class 3

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<tr>
<td>• Students expressed interest in the course being more interactive and hands-on, as well as longer.</td>
<td>• Presenting a mixture of underlying theory, contextual information and practical tools is very effective</td>
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<tr>
<td>• Students expressed interest, excitement in, and basic understanding of the Ushahidi/Crowd Map platform</td>
<td>• Adequately planning timing consistently poses a challenge for guest lecturers, particularly during the 2 ½ hour class format.</td>
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### Class 4

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<th>Summary of Student Feedback</th>
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<tr>
<td>• Very enthusiastic student response to this lecture, particularly regarding the easy-to-follow pace of the presentation, ample guided practice time and lab setting</td>
<td>• Clear, measured style of presentation with ample time for practice and questions and interaction is highly effective</td>
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<td></td>
<td>• Holding class in a lab allows for improved instructor – student interaction and facilitates practical portion of class</td>
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### Class 5

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<tr>
<td>• Student feedback primarily positive; some frustration with the (lack of) ease of use of FrontlineSMS</td>
<td>• High level of group interaction facilitates learning and engagement</td>
</tr>
<tr>
<td>• Students enjoyed splitting into groups during class</td>
<td>• FrontlineSMS is very challenging to set up correctly, but it also fills a unique niche in the market. It may be prudent to consider including more user-friendly platforms in future courses.</td>
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Crisis Simulation

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<tbody>
<tr>
<td>• Overwhelmingly positive response</td>
<td>• Crisis simulation is an essential part of the learning process because it provides students with a hands-on experience of the use of the tools they have learned about and requires them to connect the dots between their knowledge of disparate platforms, humanitarian crises and program and operational management.</td>
</tr>
<tr>
<td>• The simulation brought everything together and made the process of crisis mapping “make sense”</td>
<td></td>
</tr>
<tr>
<td>• Students felt prepared to deploy the platforms in response to the simulated crisis</td>
<td></td>
</tr>
</tbody>
</table>

Class 6

No post-class evaluation was conducted for the final class, due to time devoted to final course evaluation.

Final Course Evaluation

<table>
<thead>
<tr>
<th>Summary of Student Feedback</th>
<th>Key Lessons Learned</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Crisis simulation a highlight of the course</td>
<td>• Crisis simulation is necessary component of course</td>
</tr>
<tr>
<td>• Students valued hands-on practical experience and real – world applicability of the class</td>
<td>• Structure class in order to provide in-class time for hands-on practice; work with guest lecturers to maximize efficiency of lectures</td>
</tr>
<tr>
<td>• Interest in making the class a full credit, with longer class-time</td>
<td>• Allow time in class to discuss readings, and incorporate into lectures wherever possible</td>
</tr>
<tr>
<td>• Tie readings into course more significantly</td>
<td></td>
</tr>
</tbody>
</table>
EXP-0044-s-Crisis Mapping Technology, Resources and Disaster Relief

What Worked Well:

**Group structure**
Students were divided into groups of 4 – 5 based on interest and familiarity with the subject matter. The majority of assignments were completed collaboratively in groups, mirroring the real world working environments for crisis mappers.

**Sequence of classes**
Starting with a basis in humanitarian action and program design meant that students were able to ground all technology assignments in concrete contextual considerations. It is additionally recommended to begin with Open Street Map or Google Earth, and to finish with Frontline SMS and a wrap-up session.

**Use of guest lecturers**
The use of guest lecturers provided students with a breadth of perspectives and in-depth expertise based on their experiences. It is important to adequately brief and guide guest lecturers to be sure that all necessary material is covered within the timeframe allotted.

**Crisis Simulation**
The crisis simulation proved essential to student learning. See Lessons Learned section above.

**Lab structure**
Students received in class instruction, then met during off-weeks to work on group lab assignments. This allowed students to work with the material and apply it immediately following each class. The effectiveness of this approach was made clear through the facility with which students executed the tasks required to set up a crisis mapping response during the simulation.

**Ignite-style presentations**
Students gained experience in a real-world presentation style that required significant preparation.
**EXP-0044-s-Crisis Mapping Technology, Resources and Disaster Relief**

**Partnership with FieldEx**

Partnering with FieldEx allowed the crisis mapping class to launch a simulated crisis mapping response to an extensive, well-planned and executed simulation scenario, far above and beyond the scope that would have been possible.

**Weekly office hours**

Roz and Jennifer held office hours each week that class was not in session. Students came to discuss assignments, the field of crisis mapping, and career opportunities.

**Connecting students to internships and further opportunities**

Since completing the class, students have found internships (2) and jobs (2) at the following organizations:

- Health Map
- Satellite Sentinel Project
- Geocommons
- International Organization for Migration

**Course web site**

All course material was posted to [http://tuftscrisismapping.com](http://tuftscrisismapping.com). This web site provided both an internal communication forum, as well as a public platform for communicating class assignments, reflections and events to the crisis mapping community.

**What could be improved:**

- A 2 2/1 hours is not enough time to cover all material
- ½ credit format may not be ideal
- At times, there was not sufficient guidance on lecture content given to guest lecturers
- Groups had little interaction with each other
- Classroom layout made it difficult to interact with students
- Students found it difficult to coordinate their schedules on the off or lab weeks
Recommendations

• **Teach as a 1-credit course that meets every week**
  This will allow the appropriate amount of class time to cover all basic material, as well as provide students with credit compensation in proportion to the amount of work required. Add a mandatory lab period every other week, and include more time to discuss theory and readings.

• **House at the Tufts GIS Center**
  Situating this class at the GIS Center will benefit both the crisis mapping students and the broader spatial technology community at Tufts. The GIS Center has the expertise and physical lab resources to hold the class, and is best situated to facilitate the coordination of guest lecturers and additional resources. Holding class in a computer lab will be much more conducive to the interactive and technology driven learning of the course.

• **Add class sessions on GPS and GIS**
  Providing students with a basic introduction to GIS and GPS will greatly enhance and round out the existing curriculum and fill several noted gaps in student knowledge. GPS training will further increase the range of skills students bring to future crisis mapping efforts. GIS training will allow students to become aware of the wider geo-spatial technology field, and point them in the direction of opportunities for further study.
Appendix 1

**February 1, 2011: Why Maps?**

**Crisis Scenario**

**Country Background**
- Official name: The Kingdom of Morocco
- Population: 32.4 million (2010 est.)
- Capitol: Rabat
- Largest city: Casablanca
- Official language: Arabic (Moroccan Arabic and Berber are ‘recognized’ languages)
- Religion: 99% Islamic (Sunni)

**Scenario Background**

There is an election coming up in Morocco in 2 weeks.

The Islamic leaning PJD (Justice and Development Party) has been accusing the monarchy of election tampering, and the more militant Hizb ut-Tahrir has gained a much larger following through its emphasis on a return to Sharia “at all cost.”

In Rabat, political tension remains low because the King has focused his efforts on the capital; however, there is talk of terrorist cells hiding in Sale who are sympathetic to Al Qaeda in the Mahgreb and Hizb ut-Tahrir.

The monarchy is worried about this situation, and the government has stepped up its arrest campaign on both sides of the river.

However, civil society remains strong and despite crackdowns on the traditional media, the social media community remains vibrant and is reporting on the unfolding events.

**The Event**

At 2:00am (local time) on February 1, 2011, a 7.5 earthquake hits the country. The epicentre of the earthquake was the wealthier suburb of Rabat, Agdal. Three major and several additional minor aftershocks hit the city.
The foreign diplomats, embassies, and international NGOs are housed primarily in Agdal.

Housing

Damage throughout the “Ville Nouvelle” of Rabat is also extensive and the coastal shantytowns were almost completely destroyed.

There are reports of numerous collapsed houses in both the Medina and Oudaya, where a large number of middle-income families live.

The sloping Medina of Sale has been badly damaged and there are already reports of people setting up camp on the river.

Infrastructure

The already barely operational port of Rabat has been rendered useless.

The new port developments on the Bouregreg River remain intact; however, this was designed tourist hub and is therefore not equipped to handle large shipments.

Roads in and out of the city are significantly damaged, including the newly built highway to Fez. The highway to Casablanca is damaged, but passable in one lane.

The airport, still under construction at the time of the quake, was also badly damaged but early assessments convey that at least two runways are operational.

The train station in Agdal is no longer operational, but both the train stations in Sale and Rabat seem to be functional.

Death and damage estimates

Over one-quarter of the population is estimated to be dead with at least another third injured.

Up to 50% of the buildings have been damaged or destroyed.

Medical facilities are very quickly overwhelmed mostly with orthopedic injuries. By daybreak the French military has arrived to provide aid and medical relief.

The international community is in shock about the earthquake, and preliminary estimates are comparing it
to the 2010 earthquake in Haiti or the 1960 earthquake in Agadir, Morocco (labeled the most destructive earthquake in the 20th century). Furthermore, Morocco’s close location to Europe (especially Spain and France), and its emphasis on tourism have made it a favorite for many people throughout Europe and the United States. There is a large and politically influential Moroccan diaspora in most western European countries, especially France. There is a great expectation to respond to this disaster (quickly) so that the response does not mirror Haiti.

Organizations (5 organizations model)

**International Organizations with office in Morocco:**

**UNICEF Morocco**
Your organization has been working primarily on a project in the Rif Mountains on increasing social capital in Berber areas.
Your entire country staff was in Fez during the earthquake meeting with schoolteachers.
Your country director was in Rabat and even though you are not getting reports of damage near the UNICEF office, you cannot get a hold of him.

International Organizations without offices in Morocco

**WFP International**
Although your response to the 2004 earthquake in Al Hoceima was substantial, you do not have a permanent office in Morocco. In general, your relationship with the Moroccan government is tenuous at best because of your support for Western Sahara refugees in Algeria.
You have not yet received an appeal for aid from the Morocco but the regional director has requested that the rapid response teams “stay put” just in case.

**Catholic Relief Services**
Your organization has a mandate to fight poverty and provide aid to victims of disaster, but you do not have any ongoing programs in Morocco. After the earthquake in 2004, your organization donated tent and food provisions but you did very little on-the-ground activities.
In the first day after the earthquake you receive multiple requests from donors to implement your renowned emergency response programs in Morocco.

**The UN**
Based in Cairo, Egypt the Regional Office for the Middle East, North Africa and Central Asia (ROMENACA) is committed to fulfilling its new renewed mandate of disaster assistance to governments with limited
capabilities. A ROMENACA team, at the request of the government, will deploy to Morocco within 24 hours to coordinate the relief activities of the national and international organizations. All organizations will need to work with the ROMENACA/Moroccan government to ensure fair and equal distribution of goods.

**Moroccan Organizations**

**Morocco Red Crescent**
You have a very strong volunteer and staff base in Morocco and maintain good relationships on the ground with all political parties.

You are the most nimble of the response organizations and you have the most experience, so many international organizations will seek to partner with you during the response.

The IFRC (The International Federation of the Red Cross) has also pledged its support and has already chartered a plane with 40 tonnes of relief supplies from Geneva - it should arrive within 24 hours.

**Moroccan Ministry of Health**
After participating in a series of disaster preparedness trainings with the IFRC and Doctors without Borders (MSF), your organization feels especially bolstered to respond to this disaster. However, several hospitals in Rabat and Sale have been damaged and it’s clear that you will need additional resources from the international community.

You have accepted assistance from the French military but maintain that your organization will be the lead for health activities.
Appendix 2

February 1, 2011: Why Maps?
In-Class Assignment

After hearing about the earthquake, you quickly assemble your team to discuss your next course of action. However, your organization’s response to the earthquake is not guaranteed, as there are numerous other organizations that have already begun pledging their support. In fact, the year has already been challenging for your staff - morale is low and fatigue is high.

Therefore, your first task is to go through your priorities as an organization and begin to understand the nature of your response. ROMENACA has called a meeting of all organizations in the area and asked for your team to present your draft action plan. Numerous organizations will be present, so the director has asked that each group spend three minutes detailing their plan. She is known to be a stickler for time, so be prepared to stick to your 3 minutes.

As an organization, go through the following questions and consider how your organization would respond. The key is to role-play and consider the constraints and resources present for your group.

First, would you intervene? Why or why not?
If you are not intervening:
- What are the constraints on your team preventing your intervention?
- What does the mandate of your organization say about humanitarian emergencies? How are you fulfilling that mandate?
- Would you consider offering material or financial assistance to the relief effort? Why or why not?
If you are intervening:
- Why are you intervening? How does that coincide with the mission of your organization and which area do you feel that you have the most competency?
- Do you work with partners? If so, who? If not, why are you choosing to operate alone?
- Where would you intervene? Do you have a specific population or region that you would serve?
- What services does your organization typically provide? What would you provide in this situation?
- What resources do you require: staff, transport, money, etc.
- What assumptions are you making?
Appendix 3

February 1, 2011: Why Maps?
Lab Assignment

Part 1
You’ve gotten approval from ROMENACA to operate in Morocco; however, the director is generally very skeptical about the utility and efficiency of NGOs in disaster response, and requires significant planning documentation before you can proceed. She understands that as humanitarian organizations your primary motive is to alleviate suffering and not to write proposals; however, she is a firm believer that aid agencies, without plans, can do more harm than good. Furthermore, with the recent uprisings across North Africa the director is worried about the tenuous security situation in Morocco.

All NGOs are required to:

Conduct an assessment of the population that they intend to serve and to submit the results to the ROMENACA director.

Based on the results of the assessment, NGOs must submit a detailed action plan.

For your needs assessment plan, please answer the following questions:

• What is the population you intend to serve?
• Where is that population located?
• What do you need to know before you begin to deliver services?
  Please list only 15-20 questions here and make sure you indicate which are your top priority
• What methods will you use to gather information?
  This includes: surveys, interviews, focus groups, etc.
• What resources do you need to conduct an assessment?
  This includes: Time, money, people, technology, etc.
• NOTE: NGOs face enormous pressure to respond as quickly as possible, in the face of rapidly deteriorating humanitarian conditions.
• What are important considerations?
This includes: security, culture, gender/family dynamics, access, etc.

NOTE: It is crucial here that you consider the assumptions you are making. Explicitly list at least 10 assumptions that are inherent in your plan.

Your answers to these questions should be typed in memo format, in no more than two single-spaced pages.

Before beginning step 2 of the assignment, all teams will need to meet with ROMENACA (aka Roz or Jennifer).

Part 2
Now you’ve done you’re assessment and you’re able to actually begin work. For the purposes of this assignment, assume that your organization will implement one single program in the disaster zone.

Considering 1) the findings of your needs assessment, 2) the mandate of your organization and 3) the broader context (other response organizations and political and security context), create a brief outline of your program design.

The Program Design should include the following elements:

1) Program Goal
2) Two Objectives
3) Two outputs and two activities for EACH objective
4) A brief discussion or bullet-point list of key assumptions (at least 10)
5) Theory of Change

Program Design Ignite Presentation. The ROMENACA director requires that all NGOs actively participate in the cluster meetings and has asked that representatives come to the first cluster meeting (February 15) prepared to show a short, 5 minute presentation on the program design of their planned intervention. The director has requested the presentation format to be an “ignite” style presentation. This means that your slides will auto-advance every 20 seconds, and must cover each of the required points extremely efficiently. There will be a time for questions and answers after the presentation, during which you may be requested to further elucidate the logic and reasoning behind your program design.
A few resources:

http://www.trust.org/alertnet/country-profiles/morocco/
www.reliefweb.int
http://ignite.oreilly.com/
Appendix 4

March 1, 2011: Deploying the Ushahidi Platform: Technical and Human Challenges
In Class Exercise

Crowdmap.com Exercises
for Tufts Presentation, 1 March 2011
Link: goo.gl/h92wc

Crowdmap is Ushahidi’s web service, providing hosted installations of the Ushahidi 2.0 platform, managed by individual user accounts. Save for a few features (such as the ability to install new plugins and additional themes), Crowdmap has the same features and capabilities that the downloadable Ushahidi application provides.

Class exercises:
Visit crowdmap.com and create your own account.

Create a new instance and log into the administration dashboard.

Perform some basic, standard settings configurations.
Enable clustering on the map (Settings)
Change the location to PaP (Manage:Map)
Remove the Hello Ushahidi report (Reports)

Import the dataset of reports from haiti.ushahidi.com. (Hint: it’s under Reports).
The dataset (Crowmap_Dataset.csv) is available at: http://cl.ly/4wFy

View the current list of records.
Fix the one report currently located in the ocean (it should be located on the runway in the nearby airport.
Create a new report with the following information:
Title: Food/Water/Tents needed - 350 people in Field near Villa Factory in Thor 65 on Ruelle Souchet, PauP
Location: Thor 65, Ruelle Melisse Souchet, Port-au-Prince, Haiti
Description:
Nou bezwen mange , dlo, epi tant pou nou domi. P????sonn pa pase vizite nou sou teren ki pi pre faktori
vila a nan thor 65 rue souchet ki gen plis pase 350
~~~~~~~~~~~~~~~~~~~~~~~~

We need food, water and tents to sleep in. No one has come to see us on the field near the villa factory in
thor 65 on road Souchet. There are more than 350 people here.

~~~~~~~~~~~~~~~~

We having problems with corpses, please help us, I'm Eloi Luc
Latitude: 18.548286
Longitude: -72.324852
Mark the report you just created as approved and verified.

Create a new report while on the public website (submit any content).
View the new report within the administration section and approve it.
Confirm the report appears on the map.

We invite you to continue to work with Crowdmap. Feel free to continue to work with the system by creating new instances and familiarizing yourself with the Ushahidi platform.

Thank you,
Rob

prepared by Rob Baker
CEO, Konpa Group
Director, Universities for Ushahidi
Lead Developer, community.ushahidi.com
robbaker@ushahidi.com
Appendix 5

March 15, 2011: Google’s Geospatial Technologies Lab Assignment

Goal
The goal of this assignment is to understand the benefits of using Google Earth as well as the differences between a Google Earth mashup and Ushahidi.

Process
Take the data from your crowd map and load it in Google Earth.
Create a customized KML with the goal of information sharing across organizations.
Include at least 3 examples each of the following elements:
- Polygons
- Paths
- Pictures to go with reports
- Links to web sites and video and/or embed content

Embed video
Customize icons

Your task is to use Google Earth to create situational awareness and increase understanding of the local context within NGO teams.

In your presentation or blog, discuss the benefits and challenges of using Google Earth
- Why did you choose your specific data visualization? What elements did you customize and why?
- What you want to convey?
- Why does your target audience matter?
- When would you use Ushahidi? Google Earth? Why?

Use the Darfur KML as an example.

Presentation Teams: MoH, WFP, UNICEF
Blog Teams: Red Crescent, CRS

Google Resources
If you need help, please don’t hesitate to come to office hours or email. Please also look at Google’s tutorials: http://www.google.com/intl/en/earth/learn/index.html
Appendix 6

April 5, 2011: Crisis Mapping Without Maps: Frontline SMS
Individual Assignment

Using the techniques discussed in class, think through a work flow in which you could use FrontlineSMS for your organization.

Write out this work flow briefly using any format you choose (bullets, paragraph, workflow, etc.)

Questions to consider:

- What assumptions are you making?
- What are considerations you need to make?
- How can this go wrong?

Please don’t forget to work through the process needed as well as what you are asking of your reporting population.

Please email this to Roz and Jennifer by midnight on Friday, April 8. This is an individual assignment (but you can consult your group.)
Appendix 7

Comootros Background (crisis location – not actual)

Comootros is an ethnically divided, resource-rich island state in the South Pacific. It is home to two ethnic groups, the majority Tumbili, and minority Bandar (adj: Bandari), which respectively constitute 70% and 30% of the population. In the early 19th century, Comootros was colonized by the British, who were attracted to its strategic location and multitude of natural resources. The British favored the Bandari ethnic group, installing them as local leaders in the colonial state. This resulted in chronic structural inequality favoring the Bandars that has lasted into modern day. After a brief period of democracy post-independence, a military dictator from the Bandars came to power. He maintained a largely symbolic two-party parliament, with representation of both ethnicities. Real control remained under the control of the dictator and his cronies.

In recent years, an armed resistance group, the “Pikipiki Rebels,” has begun to violently contest military rule. The Pikipiki Rebels claim to represent Tumbili interests, but in fact, their small membership base consists mostly of disaffected Tumbili youth. Though they are not yet widely supported by the rest of the Tumbili, the Comootros military government has used the Pikipiki Rebels’ emergence as a justification to clamp down on Tumbili civilians.

Immediate Pre-Scenario

On the 25th anniversary of military rule, the dictator is assassinated. Though the perpetrators have not been identified, the Comootros Military is responding by targeting Tumbili civilians. The Pikipiki Rebels are also taking advantage of the lawlessness for their own gain. The politicians scramble to form the first legitimate parliament in years.

Meanwhile, the increased fighting and targeting of civilians from both sides has led to the displacement of hundreds of thousands, most of whom have taken refuge in an IDP camp administered by international NGOs on the outskirts of the capital. With a growing humanitarian and political crisis, the United Nations Security Council has authorized a peacekeeping mission, UN Operations in Comootros (UNOCOM).

Crisis Mappers

The Fletcher School of Law and Diplomacy at Tufts University organized a crisis mapping working group in anticipation of the 4th annual International Conference on Crisis Mapping (ICCM). The goal of the working group is to put together a series of presentations for ICCM on their findings and recommendations.
Specifically, the meeting is geared towards analyzing the use of crisis mapping tools in conflict and post-conflict scenarios. There are representatives from a variety of humanitarian agencies together for one weekend to discuss these issues and ways to move forward. Two members of the Crisis Mapping Network as moderators, but the working group has no hierarchical structure, as it is being a meeting of peers.

On the second day of the meeting, crisis in Comootros strikes – the military dictator is assassinated and the regime responds with force. Instead of writing about abstract ideas, the working group decides to respond to the evolving conflict by setting up a communication system with the ground (in an effort to increase situational awareness.)