Community Impacts of Fuel Spills: A Case Study from BC’s Central Coast

BCCDC Environmental Health Seminar Series
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Outline: Three Parts

1. Health effects of oil spills
2. Case Study: Bella Bella Diesel Spill
What have large marine spills taught us about effects on human health?

- Deepwater Horizon (USA)
- Hebei Spirit (South Korea)
- Prestige (Spain)
- Exxon Valdez (USA)
- Tasman Spirit (Pakistan)

- Short paper:  www.ncceh.ca
- Long paper:  www.vch.ca
What have large marine spills taught us about effects on human health?

• Short-term effects
  – Headache, nausea, respiratory effects
  – Reversible, lasting days to months depending on duration of exposure

• Long-term
  – Respiratory, endocrinology, immunological
  – Sub-clinical effects, significance to long-term health unknown.

• Mental Health & Community disruption
  – Income loss (or rapid gain), health concerns, litigation
  – Individuals → Anxiety, PTSD (individuals)
  – Community disturbance → addiction, domestic violence, social cohesion
Clean-up-related ill health effects

• Differential risk depending if you are:
  – Professional paid clean-up worker
  – Volunteers with variable training/PPE
  – Wildlife handlers
  – People who just show up
Who is most at risk?

- Children
  - *Deepwater Horizon, Hebei Spirit*
- Natural resource-based communities → fishing, etc.
- Indigenous communities
  - Traditional foods; natural resource focus
  - Holistic views on health and the environment
  - Disproportionately impacted in past spills.
## Recent Spills in Canada

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Type</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 2005</td>
<td>Wabamun Lake, AB</td>
<td>Derailment</td>
<td>1,300,000 L bunker fuel oil</td>
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<tr>
<td>July 2007</td>
<td>Burnaby, BC</td>
<td>Pipeline</td>
<td>250,000 L crude oil</td>
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<tr>
<td>April 2011</td>
<td>Little Buffalo, AB</td>
<td>Pipeline</td>
<td>4,500,000 L crude oil</td>
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<tr>
<td>June 2012</td>
<td>Red Deer River, AB</td>
<td>Pipeline</td>
<td>500,000 L sour crude</td>
</tr>
<tr>
<td>July 2013</td>
<td>Lac-Mégantic, QC</td>
<td>Derailment</td>
<td>100,000 L crude + fatalities</td>
</tr>
<tr>
<td>July 2015</td>
<td>Vancouver, BC</td>
<td>Marine</td>
<td>2,800 L Bunker C fuel oil</td>
</tr>
<tr>
<td>July 2016</td>
<td>North Battleford, SK</td>
<td>Pipeline</td>
<td>225,000 L heavy crude</td>
</tr>
<tr>
<td>Oct. 2016</td>
<td>Bella Bella, BC</td>
<td>Marine</td>
<td>130,000 L diesel (+ other)</td>
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Sinking of the Nathan E. Stewart

Booms scattered over critical harvest area compromised by the spill
October 13th, 1:00 a.m.: Sinking of the Nathan E. Stewart

- Tug crashed into a reef and lost its barge in Gale Creek, Seaforth Channel
- 237,262 liters marine diesel and hydraulic oil dispersed
- Seaforth Channel is traditional and commercial harvesting bread basket
- Weeks before clam fishery opening
Heiltsuk were first responders

- Heiltsuk boats, responders, witnesses at incident site
- No oil spill equipment
- No oil spill training

Local responders using small skiffs to prevent the barge from running further up on the rocks.

Absorbent materials and booms used in initial attempt to contain the spill.
Heiltsuk accommodated and fed over 200 people in Bella Bella for 6 weeks

- Kirby Corporation, Governmental bodies, spill response crews, and environmental consultants
- Unified Command in Band Office
- Heiltsuk boats and crew support
- Heiltsuk environmental expert support
- Heiltsuk administrative support
Health impacts on Heiltsuk community

• Mental and physical impacts including oil exposure, shock, and exhaustion
• Fear of food safety
• Lost current and future harvesting
• Anger, alienation, and discrimination
• Immediate and long term health needs not recognized
Remote Community, Rocky Coast

- 1,600 residents
- Within the Great Bear Rainforest
- Air or water access only
- Intricate coastline of channels and inlets

Image credit: Google Maps 2016
Immediate Happenings

• The very first responders were local residents
• Remote location
• Minimal onsite coordination
• Protection of key harvest areas

Image credit: FNHA
Image credit: Heiltsuk Nation
Environmental Public Health Response

• First Nations Health Authority
• Vancouver Coastal Health
• PREOC Coordination Calls
  – Nation representative on Unified Command
  – Appropriate responders appeared to be on-scene
  – Situational awareness, remote presence
• Day 3 notification by Hospital Manager and Community Health Nurse
• Local responders – no PPE, exposure to vapor and/or dermal contact with diesel
• Follow-up with Unified Command
Immediate Public Health Actions

- Guidance for Volunteer Crews
- Onsite presence – Manager and 2 EHOs
- Verify onsite safety plan with Safety Officer
- Diesel and Health FAQ
- Clinic/hospital avoidance
- Rapid health assessment
Rapid Health Assessment

• **Several objectives:**
  – To assess physical impacts and encourage those experiencing symptoms to seek medical attention
  – To broadly and basically assess whether mental health impacts were being felt to a greater or lesser degree.
  – To provide community members with a “snapshot” or documentation of their status immediately post-spill.

• **Development and Deployment:**
  – At the request of the Heiltsuk Council, with VCH + BCCDC
  – Information sharing agreement put in place
  – Administered by EHOs, medical review by VCH MHO
  – Time to develop (5 days), deployed Day 8
What did the Rapid Health Assessment find?

- Assessment still in progress
- Local responders identified

Benefits:
- Recognizes individual experience, value of health
- Identify concerning exposures/symptoms
- Helped to identify all responders
- Better understand on-site situation

Challenges:
- Access to responders during response phase
- Deployed on Day 8 - late for triage in the event of severe physical impacts, *pre-prepared survey and tools are essential*
- Available interviewers - capacity in small communities
- Contaminated clothing inside homes - secondary exposure?
Supporting Community Health

• Environmental Unit/Science Table
  – Traditional food concerns – safety, tainting, key species, health of the resources, FSC, commercial, recreational
  – Seafood Safety FAQ
  – Sampling plan review
  – *Traditional knowledge is essential*

• FNHA Regional Mental Wellness Advisor

• PHSA Disaster Psychosocial Services (DPS)
  – Emotional distress

• Cultural Service Providers
  – *Ensure cultural activities continue, support healing*
Reaching out.... No single resource!

OSHA
NOAA
Alaska
Washington

VCH

Gitga’at Nation

BCCDC

Univ Ottawa

PHSA

Health Canada

NCCEH

Mental Wellness Providers:
- Cultural healing

PPE
Exposure
Symptoms
Shellfish
Sampling
Parameters
Detection limits
Closures
Reopening
Known Unknowns and Upcoming Challenges

*Human health = health of the environment*

- Fisheries closure
- When will the marine resources be safe?
  *Toxicological approach not sufficient*
- Are marine resources damaged?
  *Ecological impact and sustainability*
- What support will the community receive?
  *Immediate, long term*
- How will community impacts be assessed?
- Role clarity – FNHA and other agencies
Special Considerations for First Nations Communities

• How are First Nations communities differentially impacted?
• What aspects of the response may require reconsideration?
• What can we learn from First Nations communities?
Next Steps....

• Epidemiological review of rapid health assessment questionnaires

• Advocating for Health Impact Assessment integrated with EIA/HHRA
  – Ensure impacts to people are clearly understood
  – Potential impacts beyond toxicology
  – Establish monitoring and surveillance early on
  – Mitigate further impacts
Next Time: Crude Oil Guidance Document

- Chemical Emergency Preparedness and Response Unit (CEPRU)

- Series of guidance docs on risk characterization and management of PH risks from chemical spills
  - Cl, NH₄, HF, crude oil

- Feb. 23rd, 12 pm PST
CRUDE OIL: 
A Guide Intended for Public 
Health and Emergency 
Management Practitioners

• Aimed at PH practitioners involved in chemical emergency management
• Q&A style: covers prevention, planning and preparedness, responses and recovery
• Looking for reviewers and collaborators on NEW documents
  • H₂S, HCN, phosgene, organophosphates, military warfare agents and chemicals of greatest potential for mass exposure silent releases such as a toxic metal.

Please contact CEPRU: marc.lafontaine@canada.ca
References
