

Grand River Conservation Authority



Technical Memorandum

Author: Janet Ivey, Subwatershed Planning Coordinator

Date: January 27, 2020

Subject: New Hamburg Flood Mitigation Study – Flood Damages Survey

The Grand River Conservation Authority (GRCA) initiated a Flood Mitigation Study for New Hamburg in 2019. The objectives of the study were to update flood mapping, estimate annual average flood damage costs, identify potential options to reduce flood damages, and complete a preliminary technical feasibility and cost-benefit analysis of the options.

The industry standard method for estimating annual average flood damages employs relationships between depth of flooding and damages to structures and contents (i.e., depth-damage curves) originally developed for Alberta following flooding in 2013, and updated for use in Ontario using price indexes. Some assumptions are inherent in the methods, such as the assumptions that all residential basements are fully finished, and preparedness and mitigation measures have not been widely adopted (e.g., flood warnings, removing possessions from basement floors, foundation waterproofing).

GRCA surveyed New Hamburg residents and businesses to gather information about the characteristics of buildings in at-risk areas (e.g., whether basements are finished), types of flooding residents have experienced (river-related or sewer back-up), and damages and costs associated with floods. This information is expected to support estimation of annual average flood damages.

The purpose of this technical memo is to document survey methods, responses, and analysis. Maps are included in Appendix A. Aggregated verbatim responses to selected questions are included in Appendix C.

Methods

An 11-question survey was developed in consultation with the study's project team. On-line (SurveyMonkey) and hardcopy (Appendix B) versions of the survey were created. The survey was released at a November 25, 2019 Public Information Center for the study. Hardcopies of the survey and introductory letter were hand delivered by November 28th by Township of Wilmot and GRCA staff to properties within the study area (Regional inundation boundary, draft 2019 update, south of the railway crossing) (see Table 1, Map 1). The survey was delivered only to those properties that were expected to have occupied buildings (203 street addresses).

Responses were requested by December 6, 2019, at which point the on-line survey was closed. All on-line responses and hardcopy surveys received by December 23rd, 2019, are included in this summary. A geodatabase was created, using addresses provided in survey responses, to allow for spatial review of the results.

Results and Discussion

Ninety-seven (97) responses were received (41 on-line), 90 of which were from addresses within the study area (Table 2). Responses from the 7 addresses outside of the Regional inundation boundary were excluded from analysis of survey questions 2-6. Six properties returned 2 surveys each. Of these 6 properties, the second surveys from 2 of the properties were deemed duplicates (near identical

answers) and removed. The remaining multiple responses were assumed to be responses from tenants in multiple-occupancy buildings, and were retained. The response rate within the Regional inundation boundary was about 43% (88/203).

Table 1: Number of inundated buildings by building type and return period flood (e.g., the 100-year inundation area is the area with a 1% chance of flooding in a given year) (Source: Matrix Solutions Inc, November 2019 DRAFT).

Building Type	2 Year	5 Year	10 Year	15 Year	20 Year	25 Year	50 Year	100 Year	Regional
Residential	1	39	54	61	66	69	83	97	157
Industrial	0	0	3	3	3	3	4	6	13
Commercial	0	2	4	5	5	7	10	13	30
Institutional	0	0	0	0	0	0	0	0	5
Total ICI	0	2	7	8	8	10	14	19	48
Grand Total	1	41	61	69	74	79	97	116	205

Of the 86 survey responses, the majority (74%) were identified as residential properties (Table 3, Map 2). Forty (40) responses (45%) were from properties in frequently flooded areas (i.e., within the 25-year inundation boundary).

Table 2. Number of survey responses by return period flood inundation area flood (e.g., the 100-year inundation area is the area with a 1% chance of flooding in a given year).

Return Period	None (Outside)	2 Year	5 Year	10 Year	15 Year	20 Year	25 Year	50 Year	100 Year	Regional
Responses	7	0	13	32	36	39	40	52	61	87

Table 3: Responses by property type (Question 2).

Property type	Count	%
Residential	64	74
Industrial	1	1
Commercial	17	19
Institutional	0	0
Other	5	6
Total responses to Question 2	86*	

* One response selected multiple property types.

Half the survey respondents (51%) indicated their buildings either did not have basements or had unfinished basements (Table 4). Of the residential respondents, almost half (43%) indicated they had unfinished basements. Only 20% of residential respondents in the 25 year inundation zone had fully finished basements. This result suggests that the assumption in the flood damages estimation methodology that all residential basements are fully finished is not representative of New Hamburg residences within the floodplain.

Further, of the 17 commercial properties, more than half indicated their buildings had basements, in contrast to the flood damages estimation methodology which assumes commercial buildings do not have basements. Of the 10 commercial properties with basements, half were identified as being either partially (2) or fully (3) finished.

Table 4: Basement characteristics (Question 3).

Basement	All property types		Residential properties	
	Count	%	Count	%
Fully finished	18	21	15	24
Partially finished	24	28	20	32
Not finished	34	39	27	43
No basement	10	12	1	1
Total responses	86		63	

Survey results suggest New Hamburg residents and businesses within the floodplain have begun to adapt to flood risk, and taken steps to mitigate impacts:

- Sixty-nine per cent (69%) of respondents indicated they receive flood messages from at least one source (email, social media feeds, Alert Waterloo Region) (Figure 1). Seventeen per cent (17%) of respondents receive flood messages from more than one source. Within the 25 year inundation zone 85% of respondents receive flood messages from at least one source.
- Forty (40) respondents to Question 5 indicated they had taken measures to protect their properties against flooding (77% of the 52 respondents that answered Question 5; 47% of overall survey respondents). Those that indicated no measures were taken also reported no damages due to flooding. Mitigation measures included:
 - Removing items from basement/flood prone areas on property,
 - Raising items in storage in basement off of floor,
 - Installing sump pumps,
 - Procuring back-up generators,
 - Raising furnace and water heater or relocating to first floor,
 - Sewer backflow prevention valve,
 - Foundation waterproofing,
 - Sandbags,
 - Flood gates (plywood),
 - Replace construction materials in basement to those that are not as damaged by water (cement board instead of drywall, painted cement floor)

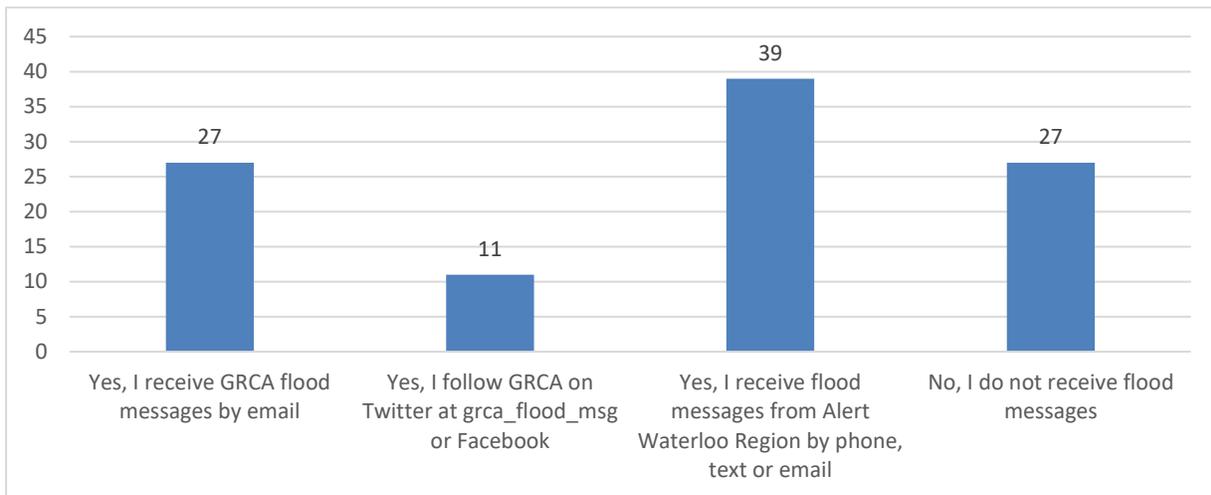


Figure 1: Responses to Question 4 - Do you receive flood messages?

Of the 82 responses to Question 6 (4 did not answer), 61% indicated they'd experienced flooding (Figure 2). About 43% had experienced damages due to flooding. Of the 45 responses to Question 7, flooding was reported most commonly in 2018 (78%) and 2008 (40%). Fewer respondents noted flooding in 2009 (4 responses) and 2017 (5 responses). Respondents were not asked how long they'd occupied their floodplain property.

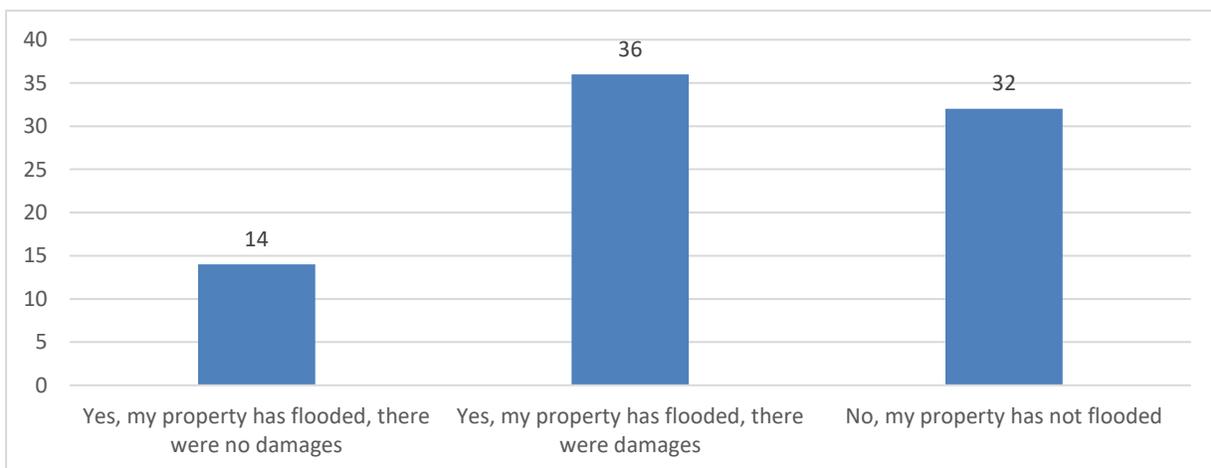


Figure 2: Responses to Question 6: Have you experienced flooding?

In the on-line version of the survey (41 responses), if a respondent selected "No, my property has not flooded", survey logic directed them to the end of the survey (i.e., skipped questions 7-11 regarding flooding experiences). Survey logic was not applied to hardcopy surveys.

Of the 44 responses to Question 8 about what floors of their home or business were flooded, 80% reported flooding of basements only (Figure 3). Some respondents selected multiple responses. The

most common responses for the “other” category were garage-only flooding. Of the 46 responses to Question 9 regarding entry of floodwaters, the most common response was leaking foundation (57%) (Figure 4) (multiple responses were allowed). Most of the “other” responses (32%) also indicated foundation or basement floor leakage. Damages due to sewer backup (35%) may not be attributable to riverine flooding.

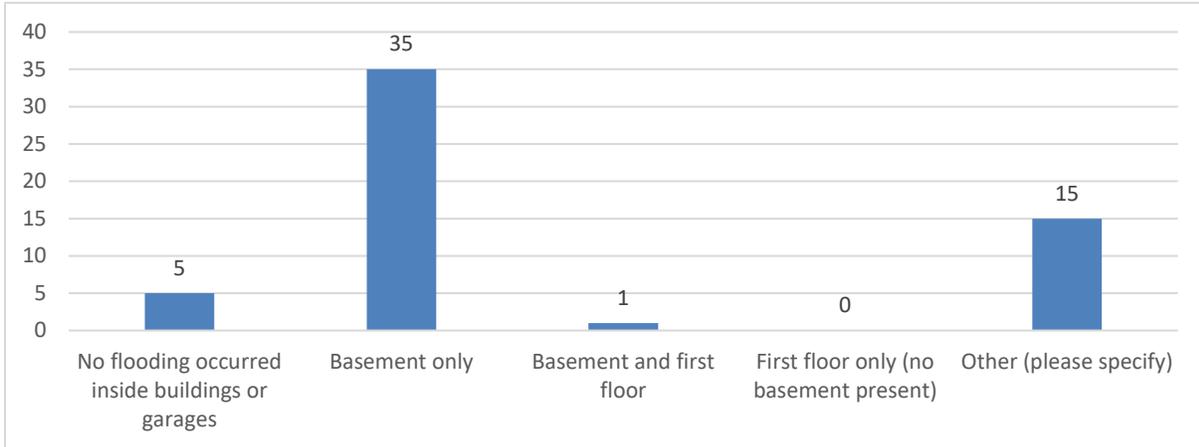


Figure 3: Responses to Question 8: What floors of your home or business were flooded?

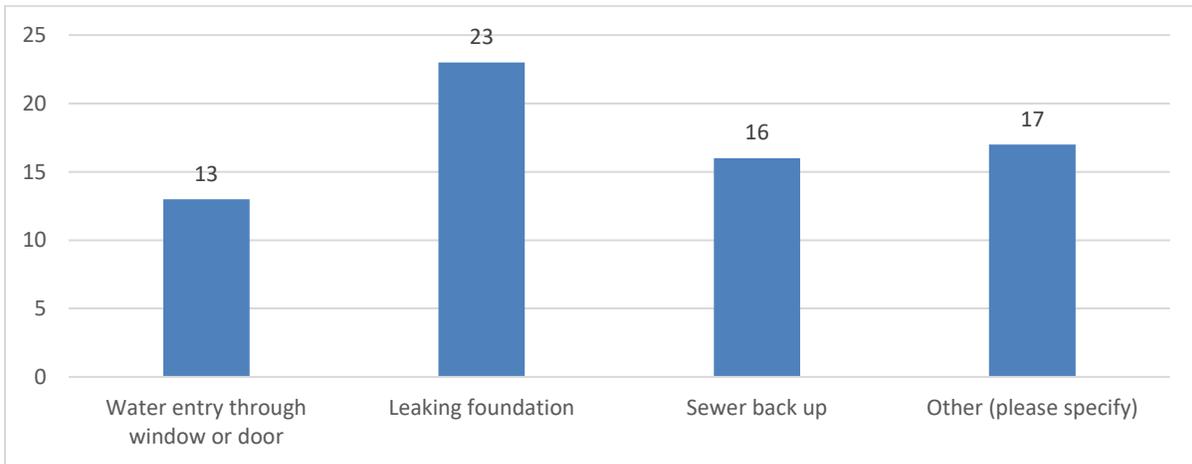


Figure 4: Responses to Question 9: How did the floodwaters enter your home or business?

Question 10 asked respondents to describe damages that flooding had caused to their property or buildings. There were 47 responses. Flood damages included:

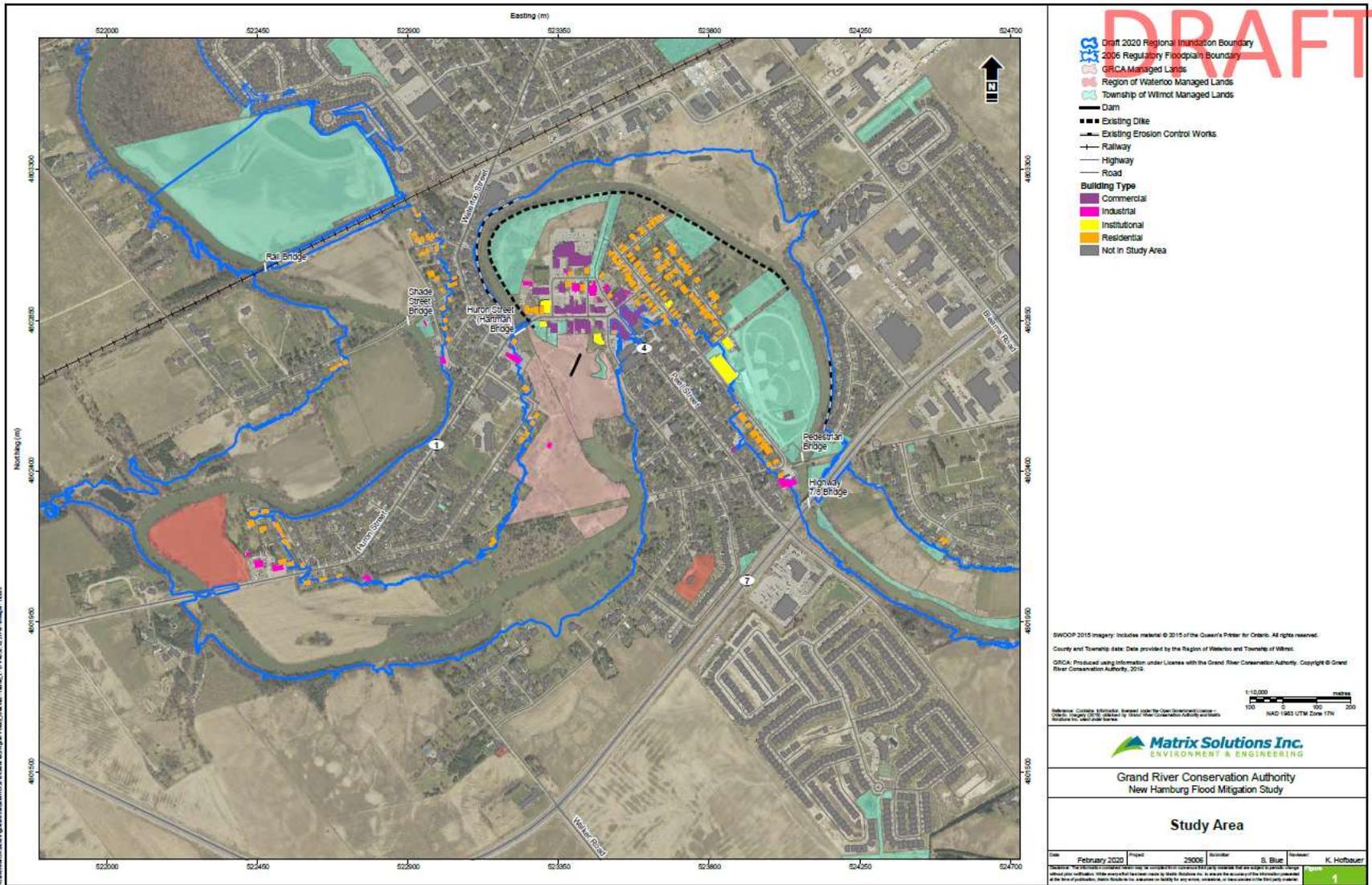
- Minor damage to property requiring clean up
- Small engine - mowers/snow blowers - damaged
- Basement clean up/drying
- Windows broken
- Basement subfloor, carpet, drywall, wood framing, insulation
- Furnace, water heater, electrical panel replaced
- Personal items, memorabilia, decorations, antiques, clothing destroyed, electronics, furniture
- Washer and dryer
- Freezer
- Damage to sump pump motors
- Mildew/mold in basement
- Lost wages/lost business opportunity

Forty-three respondents answered Question 11 about the total cost of flood damages experienced. Four indicated \$0 damages. The remaining estimates ranged from under \$100 to \$100,000. For those reporting damages, they averaged \$18,000-\$19,500 (this includes flood damages for multiple events for residents who had occupied their homes for up to 51 years). Many cost estimates were provided as ranges with ranges spanning \$5,000-\$20,000 from low to high estimates.

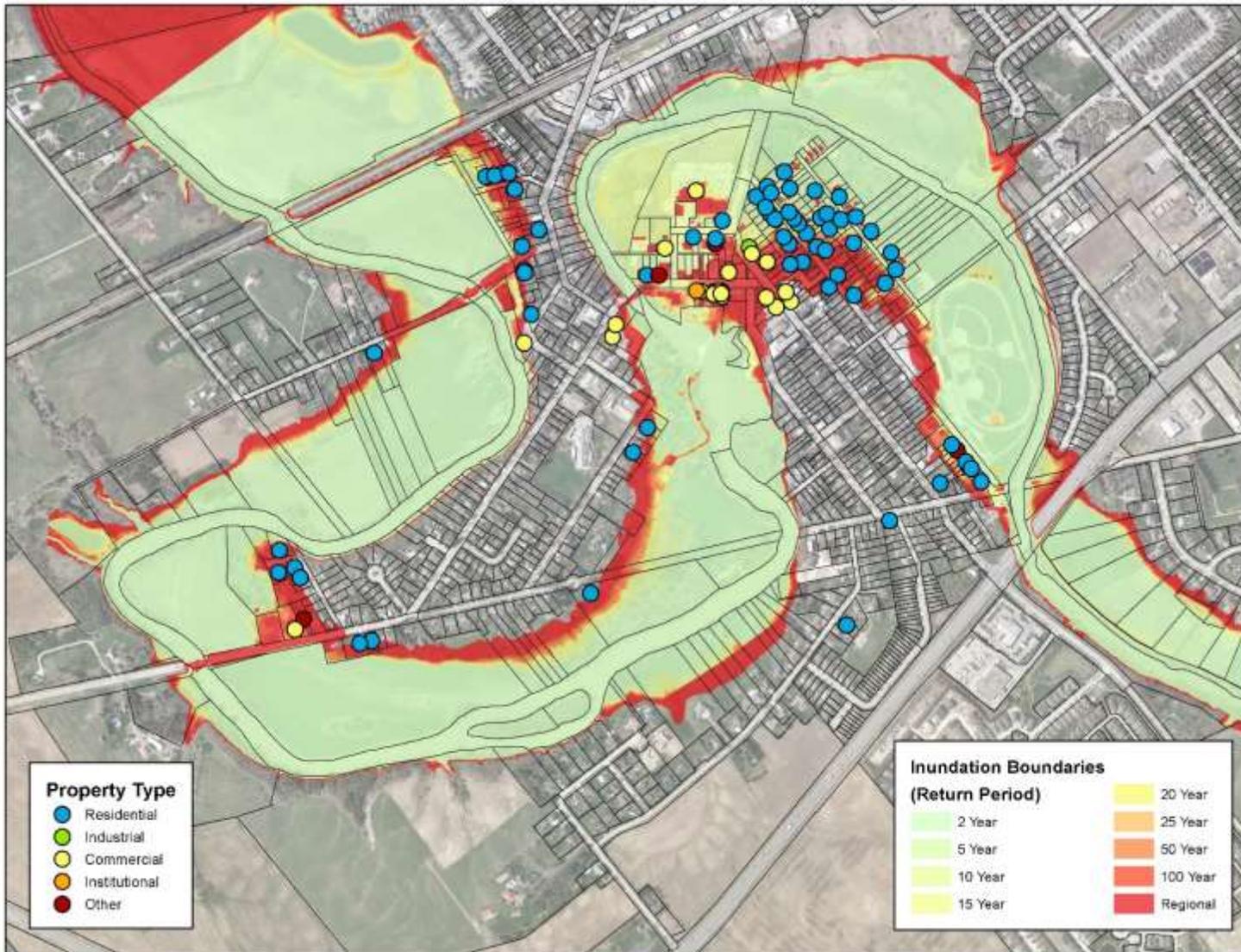
References

Matrix Solutions Inc. November 2019. New Hamburg Flood Mitigation Study. Technical Memo No 1: Flood Damage Estimates. Version 0.1. Draft. Prepared for Grand River Conservation Authority.

Appendix A: Maps



Map 1: Buildings within the New Hamburg flood mitigation study area by building type (Source: Matrix Solutions Inc, November 2019 DRAFT).



Map 2: Survey responses by property type.

Appendix B: Survey and Cover Letter



November 20, 2019

Dear Occupant,

The Grand River Conservation Authority (GRCA) is undertaking a Flood Mitigation Study for New Hamburg. The objectives of the study are to update flood mapping, estimate annual average flood damage costs, identify potential options to reduce flood damages, and complete a preliminary technical feasibility and cost-benefit analysis of the options. Public Information Centres were held in June and November of 2019. Posters from the information sessions are available at the study web page: www.grandriver.ca/NHFloodStudy.

GRCA is seeking input from New Hamburg residents and businesses. Information about the characteristics of buildings in at-risk areas (e.g., whether basements are finished), types of flooding residents have experienced (river-related or sewer back-up), and damages and costs associated with floods, will provide valuable context for the study.

Please fill out and return the enclosed survey or complete the on-line version by December 6, 2019.

Pursuant to section 29(2) of the Municipal Freedom of Information and Protection of Individual Privacy Act R.S.O. 1990, C. M.56 the personal information contained on this survey is collected under the legal authority of the Conservation Authorities Act, R.S.O. 1990, chapter C.27 and will be used for research purposes in support of the New Hamburg Flood Mitigation Study.

The data collected as part of this survey will be shared with consultant Matrix Solutions Inc, and the Project Team, which includes representatives from the Township of Wilmot.

Questions about the collection of personal information should be directed to Janet Ivey, Subwatershed Planning Coordinator, GRCA, PO Box 729, 400 Clyde Road, Cambridge, Ontario, N1R 5W6, Tel: 519-621-2761 ext 2325 or NHFloodStudy@grandriver.ca.

Thank you for your assistance.

Best regards,

A handwritten signature in black ink, appearing to read "Janet Ivey".

Janet Ivey



New Hamburg Flood Mitigation Study

Survey of Residents and Businesses



Please choose one of the following options:

- Fill out the survey online at www.surveymonkey.com/r/FloodStudy or scan the QR code above, or
- Fill out this sheet and fax it to (519) 621-4844, scan and email to NHFloodStudy@grandriver.ca, or mail it to us using the postage paid envelope provided.

Submit your survey by **Friday December 6, 2019**. Thank you for your input!

1. Please provide your address: _____

2. What type of property are you completing this survey for? (circle one)

- a. Residential
- b. Industrial
- c. Commercial
- d. Institutional
- e. Other: _____

3. Does your home or business have a finished basement? (circle one)

- a. Yes, fully finished
- b. Yes, partially finished
- c. Not finished
- d. No basement

4. Do you subscribe to or receive flood messages? (circle all that apply)

- a. Yes, I receive GRCA flood messages by email
- b. Yes, I follow GRCA on Twitter at [grca_flood_msg](https://twitter.com/grca_flood_msg) or Facebook
- c. Yes, I receive flood messages from Alert Waterloo Region by phone, text or email
- d. No, I do not receive flood messages

5. Please describe any flood protection measures that you have taken (e.g., elevating or removing contents in the basement, sewer backflow prevention valve, foundation waterproofing).

6. Have you experienced flooding on your New Hamburg property? (circle one)
- a. Yes, my property has flooded, there were **no** damages
 - b. Yes, my property has flooded, there were damages
 - c. No, my property has not flooded

If you have experienced flooding, please answer questions 7 to 11 for a specific flood event.

7. When was your property flooded? e.g., 2008, 2018

8. What floors of your home or business were flooded? (circle one)
- a. No flooding occurred inside buildings or garages
 - b. Basement flooding only
 - c. Basement and first floor
 - d. First floor only (no basement present)
 - e. Other: _____

9. How did the floodwaters enter your home or business? (circle all that apply)

- a. Water entry through window or door
- b. Leaking foundation
- c. Sewer back-up
- d. Other: _____

10. Please describe the damage the flooding caused on your property or to your building(s):

11. Please estimate the total cost of the flood damages you experienced: \$ _____

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The data collected as part of this survey will be shared with Matrix Solutions Inc, the consultant for the Study, and the Project Team, which includes representatives from the Township of Wilmot.

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Appendix C: Aggregate verbatim responses to survey questions 5, 7, 10 and 11

New Hamburg Flood Mitigation Study Aggregate Responses

Question 5. Please describe any flood protection measures that you have taken (e.g., elevating or removing contents in the basement, sewer backflow prevention valve, foundation waterproofing).

- I have installed two sumps. The downtown people of New Hamburg collected money to assist people whose property is affected by flooding.
- We removed all contents that was possible in the basement. We open a valve in the foundation to let water flow away. Sandbags if available from the township.
- My house has a 3 foot drop from backyard to the farmer's field. The field floods, it has never come over the bank even when downtown is under water.
- Replaced main sewer backflow valve. Installed a sump pump.
- Sandbags around main doors
- Elevated shelves for storage in the basement.
- Made flood gates. Painted foundation waterproofing paint.
- We elevated sine if the contents in the basement. However, had we not been home, there probably would have been damage.
- Sewer prevention backflow valve, 3 sump pit and pumps
- We have moved our storage in the basement up on plastic shelving.
- Keep very little, not valuable in the basement.
- Removing any vehicles or produce from lower plaza parking lot to higher ground.
- Drain back flow prevention
- Removed carpet and wood subfloor. Floor is now painted concrete. Replaced wood framed walls with concrete block walls. Installed sewer backflow valve. Installed sump pump and standby generator. Built flood covers for basement windows. Purchased flood-seal system for exterior door. Raised electrical outlets and installed GFEI.
- Sump pump, floor pumps, higher furnace, stay up all night to protect property
- Keep things elevated
- I have installed a sump pump. I have installed a gas generator that plugs into the electric breaker box in case of a power outage. I use attic for storage rather than risk water damage due to flooding. I drive to Kitchener and rent a submersible sump pump to help take the strain off the installed sump pump. I try not to go away for extended periods in the winter and spring.
- Installed two sumps plus a generator in case power goes off.
- Dams – plywood, sump pumps.
- Sump pump. Nothing else required.
- Put steel studs instead of wood, spray foam, elevate wood/cloth furniture and electronics, steel framed furniture and shelving.
- We have our freezer, washer and dryer sitting on bricks and when flooding is a threat, remove all items from the floor and put them higher up, on shelving. Our furniture is on cinder blocks 1 ½ feet off the floor. We have a plug we can use for the drain.

- When notified we move things to higher ground and remove as much as possible from basement. We have installed 3 sump pumps but if hydro is out they do us no good. Our Mayor said there would be sandbags available but we have never seen any.
- Installed interior concrete below grade stone foundation liner in main basement, installed underfloor Big-O drain and new main sump & 2" pumped line to exterior c/w 50' discharge hose to street, installed bases and elevated furnace, water heater and softener, installed interior waterproofing membrane to all basement walls, purchased caps and backflow preventors for all drains, vents and intake openings to exterior of house or raised vents to 8ft. level, installed 2 secondary sump pits with Big-O drains in crawl spaces, pumped to main sump pit, raised gas meter to 24" above grade, raised exterior AC unit to 24" above grade, purchased 3" emergency gas stand-by pump with hoses and standby sump pump, installed 21KW emergency natural gas generator and mounted 24" above grade, installed door dams at exterior shed doors c/w sump pump.
- Purchasing sandbags.
- I'm honestly not sure as our Premises is taken care of by a third party. I do believe we have some sort of sump pump.
- Backflow valve
- Elevating contents, backflow preventer
- Seasonal pump installation, notices to tenants to remove items from basement.
- Foundation waterproofing. We have built (after the 2018 flood) 2 wooden panels that can be put across the front of the house to prevent water coming in where it entered last flood.
- Nothing is on floor in basement
- We do not keep anything in the basement, we board up the basement windows. We have a back flow valve
- We have elevated contents in the basement
- Extra sub pumps, back flow on sub pumps, foundation sealing, content elevated or in plastic totes, boiler/hot water tank/electric panel raised.
- Sewer backflow prevention valve
- Back flow valve, generator hook up, water barrier baffle if needed
- Removed all content from basement
- Property is elevated.
- Have now removed all basement contents
- Backflow prevention valve, sump pump with battery backup
- Foundation waterproofing, Sewer backflow prevention valve installed, basement window modification to make water-resistant.
- Nothing stored in basement, sump pump in pit, windows bricked in.
- Installed new drainage tile under basement floor routed to sump pumps. Installed secondary external basement windows to limit water incursion. Elevated furnace and water heater. Basement not used for storage.
- Removed items except furnace and hot water because we can't
- We have sub pumps in 2 locations in our basement
- I have a sump pump
- Removing any supplies or Delivery vehicles from our lower parking lot
- We are high enough up that we do not flood but we see the down town core floor and the streets around us.
- The building is slightly elevated from historic flood levels but will be flooded after the 500 and 1000 year storms.

- Sandbags.
- Elevated contents in basement, plugs for sewer backflow protection.
- All basement appliances area raised off the floor. Any contents are in waterproof containers. Nothing valuable is kept in the basement. Too bad that I have such limited use of an entire floor of the house, water comes in through the side door. I have sealed off the basement windows with Plexiglas (no longer functional).
- We have made efforts to waterproof the foundation.
- Nothing to date.
- I get a little water in the basement every spring thaw and heavy rainfalls. I run a dehumidifier spring to fall.
- 2 sump pumps, furnace on main floor, water heater on main floor.
- Basement now emptied of stored items. Foundation replaced at back of house. Old stone foundation needs waterproofing.
- Removing contents in crawl space.
- If [our property] floods, the whole town is under water.

Question 7. When was your property flooded? e.g., 2008, 2018

- 1970 and about every 1 in 3 years. 2008 – yes, 2018 – yes.
- February 2017. Can't remember the other year.
- 2018 – Sewer backflow during the big flood. No ground water came in.
- 2008, 2018.
- Tough question for dates when the municipal parking lot out back on the river floods – we do too.
- 2018
- I have lived in New Hamburg my entire life and have seen a lot of floods. Even though my wife and I live close to the Nith River and floodplain (farmer's field) the water level would have to go up at least 6 feet more before it would be any kind of concern to us. We experienced the flood of Xmas 2008, it being the worst flood for New Hamburg in quite a few years and it didn't come close to our home. If it even came close to our home, downtown New Hamburg would be a disaster.
- Our property has been flooded many times since we have lived here but the most severe flooding was 2008 and 2018.
- 2018
- We have lived here since 1974 so we have experienced all floods!!! Bad 1975, 2008, 2018. Minor ones only water in the driveway.
- 2018
- We have consistent flooding in the side yard by Milton Street – often comes half way up the yard. In 2018 it came almost to the house at the front corner. This was the highest it has been. Have been in this house since 1982.
- December 2008; February 2009; February 2018.
- During heavy rain event about ten years ago.
- Yearly. Home – never. Lower land area inundates with water when river (Nith) level exceeds channel.
- December 2007; Spring 2008; February 2018.
- December 2008; February 2017

- 2008 and 2018
- 2018
- Annually to a degree.
- 1975 – large flood in basement, 2008, minor in 2018.
- It was flooded 2 or 3 times in 2008/09 and again (the worst) in 2018.
- Twice 2008 and 2018
- February 2018
- February/2018
- 2018
- 2018
- 2018 and 2008
- 2008 and 2018
- 2018; 2010
- 2008, 2017, 2018
- Numerous times starting in 1965 the year after I moved in. Most recent 2008/2009/2018
- Both 2008 and 2018
- 2018
- I don't recall years exactly. In 2005ish I experienced 3 floods in one year. At one point basement was filled. I believe it was 2017 when there was a flash flood and basement was filled again.
- 2008 and 2018
- Spring 2018.
- 2018
- Both 2008 and 2018. I have experienced 3 floods (2 in 2008 and 1 in 2018) and an almost flood a few years ago.
- 2018
- 2018
- 2018
- Since moving there.
- 2009, 2010, 2017 Feb.
- Yes, both years. Actually it was three times we got flooded out. Sheds in yard – contents got damaged.

Question 10. Please describe the damage the flooding caused on your property or to your building(s):

- The water usually is about 2 feet. On bad years the water gets to within 6" of the Hydro Control panels, at about 5' to 6' above basement floor level.
- Furniture, rugs, couch, bed, mattress, photos, books, electrical, paneling, some clothing, some flooring, floor mats, antique dresser.
- ~\$30,000 in damages. Carpet and sub floor were damaged. Baseboards and 3" of drywall (from floor up). Furniture.
- Loss of business for 3-4 days. Large amount of mud and debris around buildings.
- Nothing I could not clean up.

- Had to replace drywall, carpet, lost some furniture, pictures that were stored in the basement.
- To this point there has been nothing significant, other than moisture which could cause damage in time. Also, a lot of clean-up on property e.g., Wood, corn stalks, mud in sheds.
- Debris from the river washed up.
- Carpets, doors, moldings, drywall etc.
- Items stored in basement in boxes were ruined.
- Deterioration of stone foundation; cracking floor
- We have not had property damage but regularly have to clean a huge mess of tree limbs and other debris that comes across Milton from the field. Some are quite large and more than I can clear myself. The last few flood have definitely dumped more debris than the earlier years.
- No physical damage, other than water that penetrates old parking lot, and causes purging due to frost.
- Damaged flooring, drywall
- Flood debris cleanup is a yearly chore. Ice flow causes tree damage (straighten or replace). Motor boat damage to river bank (wake damage) has caused more problems than any flood. Built home in 1980 and have lost (in some areas) up to 10 feet of bank to this issue. No motor boats; motor size limit; no water skiing; speed limit; no wake zone.
- Fiberglass insulation ruined, wood framed walls wet and moldy, wood subfloor and carpet ruined; drywall ruined.
- Flooring, steps, walls, door, brick wall
- Furnace was damaged in 2008 flood. I had to replace a part.
- Just wet floor.
- Ice damage to structure and fields.
- Remove carpet underlay, removed bottom drywall and replaced with cement board.
- Water damage to walls and furniture, hot water heater, tools, electronics, carpets, washed pool deck away, picnic tables.
- Have invested in an additional industrial pump so when it came up through the drain and started to rise we had to take out screen in the window, throw sump pump hose out the window into the water that was surrounding the house and cap the drain...then started pumping out the basement. Even though we pumped out the water and shop-vac'ed everything up, we still get mold. We are now in our 70s and have been here close to 40 years. The floods are getting worse and we're not sure how much longer we can go through this.
- 3 times in last 10 years we have had between 3 feet and 5 feet of water pour into our basement which destroyed our furnace, hot water tank, washer and dryer, freezer full of meat. The 1st time in 2008 we had no notice so we lost clothing, some Xmas decoration and mementos from my children's school days. Also in 2008 we sustained substantial damage outside losing our lawn mower, snow blower, bike and miscellaneous items. Not only losing material articles but the stress of not knowing if our sump pumps will keep up at least enough to stop water from reaching main floor.
- Damaged furnace, floors, walls, furniture, electronics, heirlooms
- I have lived here for 45 years and have experienced many floods over the years, sometimes 2 per year. I have fixed foundation wall damage property damage, sump

pump damage, basement sewage back-up multiple times, mildew and mold problems as a result of flood water and sewage back-ups, re-painting, damaged insulation and damage to my personal property. As a result I believe in pre-planning and preparation to battle the flooding that occurs yearly. I have little almost no record of the damage costs involved, save to say that I have bore the majority of all the costs plus the cost of the flood preparations noted above.

- Garage – items sitting on the floor, garage door; Hallway – baseboards, walls; Bedroom – floor, walls, vanity; Crawl space – Christmas items
- The basement ended up with 21 inches of water and the entire basement had to be gutted with all wet materials discarded due to asbestos concern. This also caused our server, phone system and security systems to go out and need to be replaced. We also had to close for 5 business days due to this.
- Hot water heaters, boiler, laundry machines, tenant belongings.
- Carpet and under padding was soaked and needed to be replaced.
- Damaged found riation and plumbing, damaged items in garage (lawnmower, furniture etc)
- Backyard was completely flooded (3ft of water), cars had to be relocated, basement had substantial amounts of water coming in through the walls which had to be repaired, foundation floor cracked, many personal items lost.
- 2 to 3 inches of water over the carpet floor on the basement. Water damage to the drywall walls in the basement
- Windows broken, 2 doors ruined, deck rot, driveway destroyed, snow blower and lawnmower destroyed, building materials (drywall, wood) destroyed, anything stored in garage was thrown out due to water damage. Floor and wall water damage in main building, furnace damaged by water/mud in intake ducts.
- In 1965 we lost our front porch, over the years we have lost numerous items. In 2008 the furnace was replaced and hung from the ceiling and the water heater was replaced at our cost. In 2009 the furnace had to be repaired and the water heater was replaced and moved upstairs. A friend's car parked in our driveway was covered and her insurance covered it. In 2018 the water came up an inch from the main floor. The furnace was replaced and moved to the main floor, the electrical panel was replaced and moved to the main floor. The basement was dried out. Insurance covered these items. It was the first time insurance was ever used and only because the sewer backed up first. Insurance has told us they will never cover it again.
- Furniture, finishings and chattle in basement. Chattle in Garage.
- Breakers box needed to be replaced. Hydro had to come and cut power line and then restore after flooding.
- I have had to replace my furnace and water heater 2 times. My electrical panel has been underwater 2 times and some breakers needed replacement. Sump pump had to be replaced 1 time as well.
- Had to replace a brand new furnace that was less than 6 months old with another one. Hot tub got ruined. The first floor lost a lot of stuff that was down in basement.
- Basement carpet had to be replaced as well as most of the drywall. Garage had to be sanitized.
- Minor damage to some contents. No appliance damage. Professional cleaning due to sewer backup.
- Basement items have to be waterproof or up high. Shed has to be emptied out in flood times. I am fortunate, but live in fear that my sump pump might quit working or the pump is the only thing that keeps it from being very bad.

- There was water damage to the basement walls and to a small number of articles in storage.
- Not much water entered.
- No damage. Just float around material.
- No damage.
- '09 basement filled most everything stored there \$1700 to repair furnace and water heater. Now have rebuilt house and put in new foundation on back of house and upgraded crawl space with insulation and cement floor. Old stone foundation is still in need of waterproofing when water levels rise water comes through foundation and up through floors.
- Damaged a finished room (had to redo), our pool liner was damaged along with pool pump (in ground pool). Hydro panel was submerged in water. Contents in basement (crawl space) were lost. Contents in sheds i.e., Lawn mower, garden stuff, dressers that were stored, table top.

Question 11. Please estimate the total cost of the flood damages you experienced.

- \$5,000 - 1-2 days of lost sales due to forced closing, profit on sales, employees lost wages.
- I know in the last 11 years we have spent over \$10,000-\$12,000 out of pocket and another \$15,000 from insurances. I would not know how to even estimate the previous 44 years.
- \$15,000 to \$20,000
- \$5,000
- \$30,000 - \$50,000 in 3 major floods
- The most recent flood over 4000 for a new furnace plus the 6000 of the new one we had just put in a few months before.
- \$8,000
- \$8,000
- \$40,000-\$50,000 or about \$1,000 average per year
- \$20,000 to \$30,000. Damage would have been higher if we didn't move some items out of the basement.
- Approx \$5,000
- 2008: \$35,000 2018: \$12,000
- \$2000, 8 hours of bailing incoming water out of the basement, a weekend of cleaning/drying and weeks of repairs.
- \$6,000
- \$100
- \$1,000/day closed
- \$75,000
- \$0
- \$30,000
- \$2,500
- \$15,000

- \$4,000-\$7,000
- The pleasure of living on the river area far exceeds any monetary damage caused by flooding.
- 10 hours of labour clean up.
- \$27,000
- Lots
- We no longer have insurance as it cost \$4,000 a year. We are worried with the potential for a regional flood.
- \$2,500
- \$20,000
- \$100,000
- \$1,000
- \$1,000 for bare minimum foundation restoration, plus cost of lawnmower and patio furniture
- \$15,300. \$300 to \$500 per year since 1968
- \$4,000
- \$70 for burned out sump pump
- Unsure. We rented at the time.
- Unknown as this information was not provided to me.
- 15,000. Claimed through insurance - we have overland coverage. Many of our neighbors do not.
- \$3,000
- \$40,000
- 0
- 0
- 0
- \$20,000
- \$27,000

Other comments received:

- Have you studied impacts of increased tile drainage in recent years? There are significantly more lands being cleared, then tiled. Tile runs are also much closer together in 2018/19 than in the past. Trees are being removed at an increasing rate (trees prevent runoff as well as store carbon).
- We no longer have insurance as it cost \$4,000 a year. We are worried with the potential for a regional flood.
- We need help in flood proofing our homes. How can I stop the water from coming in at my side door? Any funding available? I need a sewer backflow valve. Notifications kept the flood damages from being worse.