

Manure Incidents In Wisconsin

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Project Background

- Professional Nutrient Applicators Association of Wisconsin (PNAAW) interested in root causes of incidents
- Data on number, type, cause not compiled



Project Background

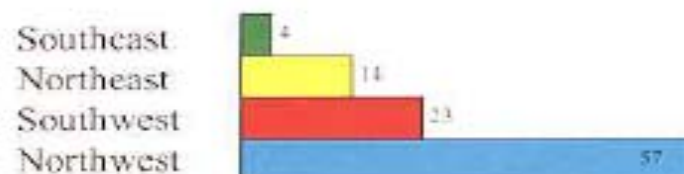
Ohio 2003 Statewide Summary

- 98 incidents analyzed
- Top 10 list of root causes developed



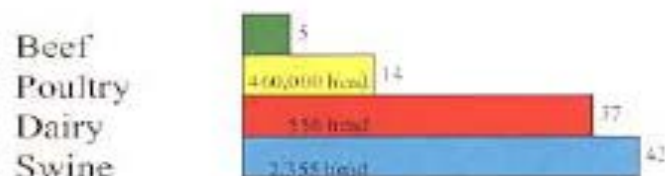
Summary of 98 Ohio Liquid Manure Violations

Location in Ohio of 98 Manure Violation Cases



*22 Ohio counties had at least one violation but six counties accounted for 57 cases. (2000-2003)

Livestock Species and Average Head per Farm



Typical operation was mid-size or large livestock operation.

Time of Year when Manure Applied



Need for Application Equipment Calibration



Farmers reported applying 0.6 inch/acre or 16,300 gallons per acre. Actual rate was 2x higher than reported rate!

Top Ten Reasons for Liquid Manure Violations on Drained Cropland (2000-2003)

- 1) Excess Rain/Saturated Soils: 69% of cases
- 2) Over Application or Application Error: 53%
- 3) Lack of Manure Storage: 33%
- 4) Ponding Manure/Excessive Irrigation: 27%
- 5) Tile Lines Flowing or Tile Plug Failure: 21%
- 6) Equipment or Storage Failure: 16%
- 7) Broken Tile or Shallow Tile: 16%
- 8) Dry Cracked Soils: 13%
- 9) Snowmelt: 10%
- 10) Earthworm Burrows: 8%

Liquid manure is 95 to 98% water, so it flows just like water! Anything that promotes good drainage will enhance flow of liquid manure to tile lines.



In 31 cases, ammonia levels were 47x higher downstream versus upstream (44.73 versus 0.94 mg/L) of a manure spill. Fish start to die at low ammonia levels.

Ideal Manure Application Equipment should:



- Apply at low rates.
- Apply at low pressure.
- Apply manure evenly.
- Shallow incorporate manure.
- Be easy to calibrate.
- Spread large volumes of manure.

Project Background

- PNAAW funded student to inventory all of the manure incidents in Wisconsin between 2005-2009.



Goals of the Project

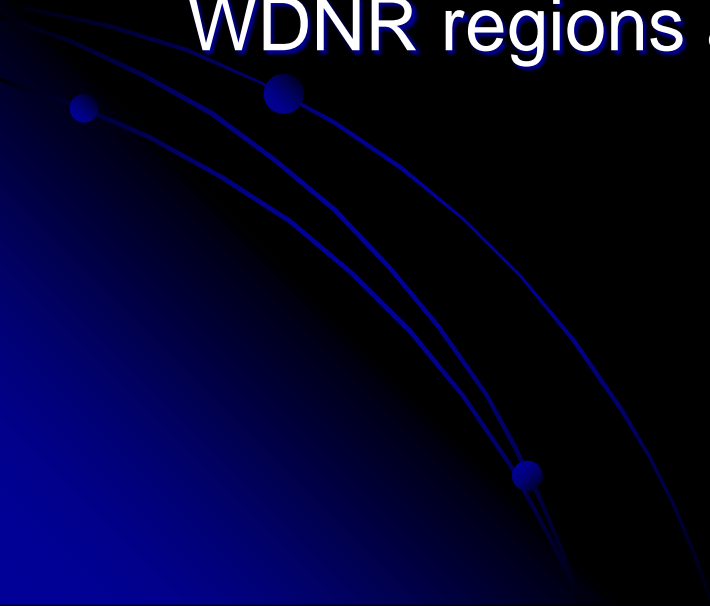
- Compile a comprehensive database of agricultural incidents to help farmers, applicator and agencies learn from manure incidents.
- Define a manure spill verses manure incident.
 - Different agencies have their own definition of a “spill”
 - Examine the need for a better definition

Goals of the Project

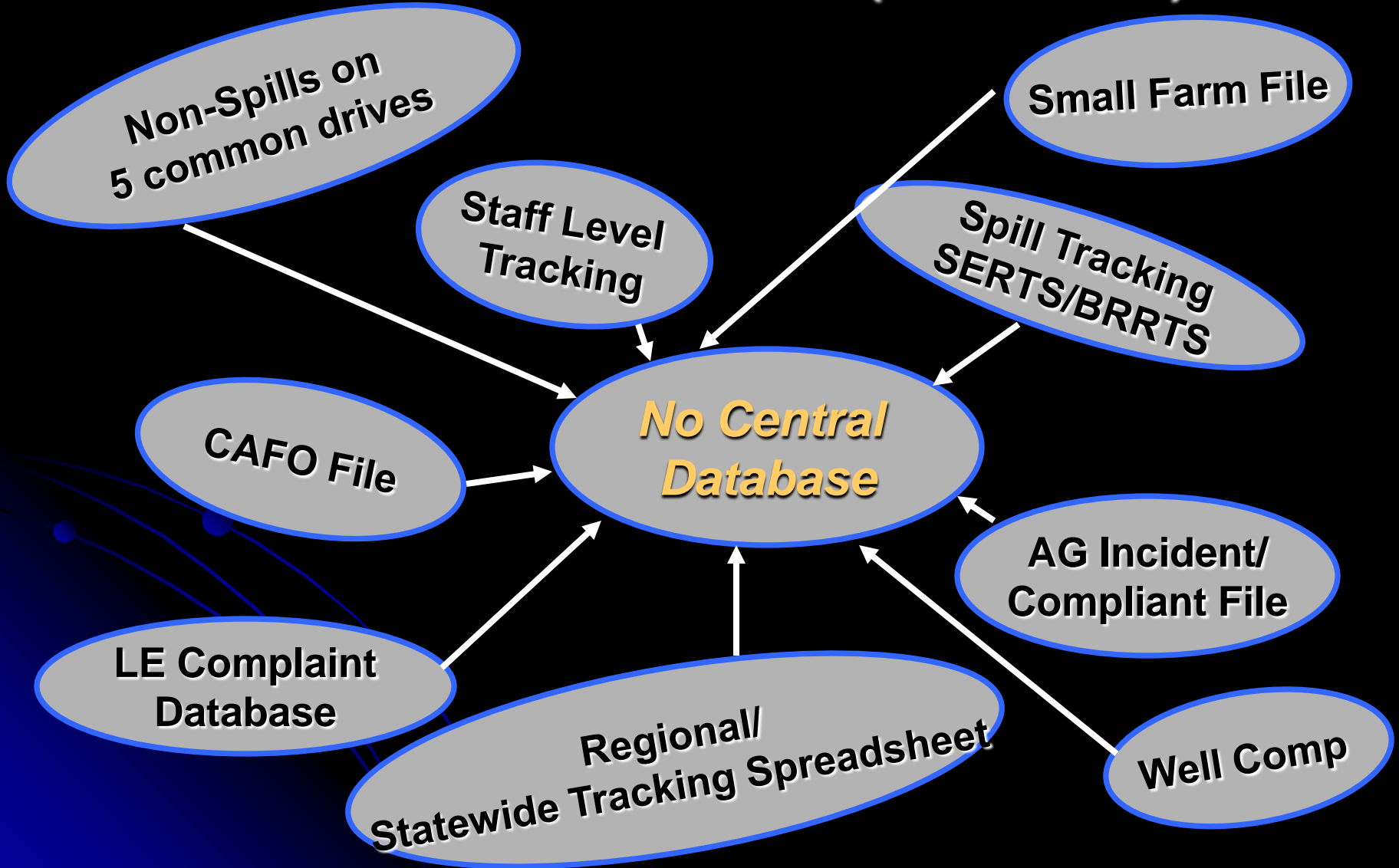


- Determine the root causes of manure spills/incidents.
- Develop simple strategies the manure application and livestock industries can use to prevent and reduce the severity of future incidents.

Data Collection

- There is no uniform tracking system between agencies, much less within a single agency. There is a wide variety of tracking systems (from through to almost non-existent) across the WDNR regions and county LCD's.
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Data Sources (WDNR)




Process

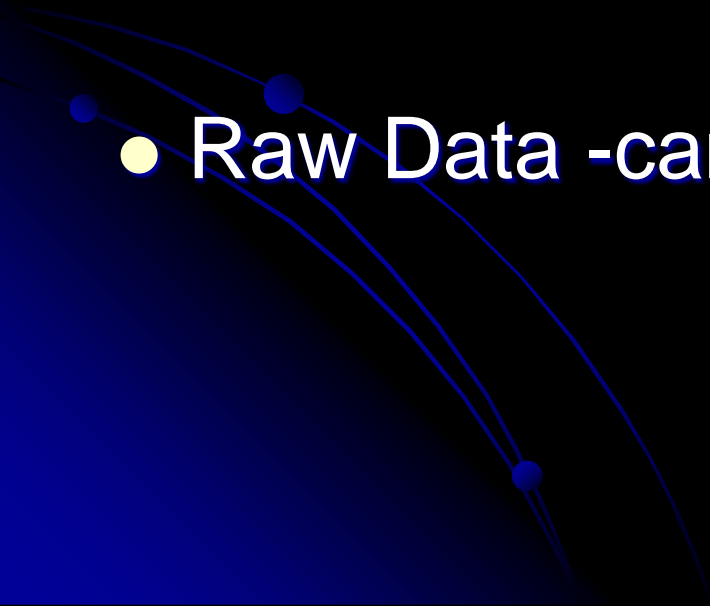
1. Review agency file, determine if a true incident.
2. Gather information on incident from all sources and summarize.
3. Provide copy to farmer, applicator for clarification/correction*

* Some farmers will not be contacted if enforcement is pending, agency investigation not complete, or if privacy is requested

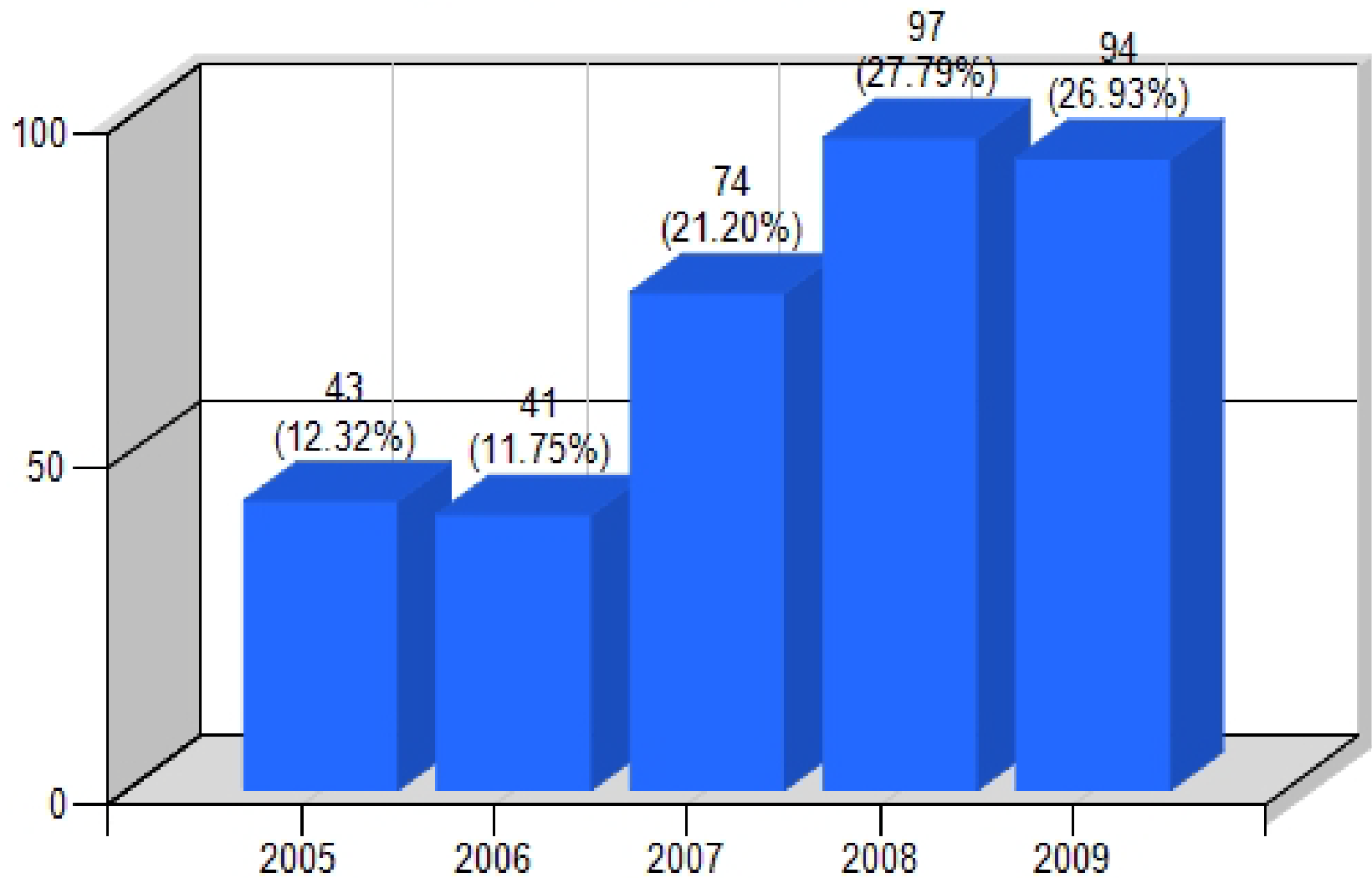
Sideboards

- Project not complete – Preliminary Results
 - Unverified Information
 - Not all incidents are reported; data may not provide a true representation of incidents
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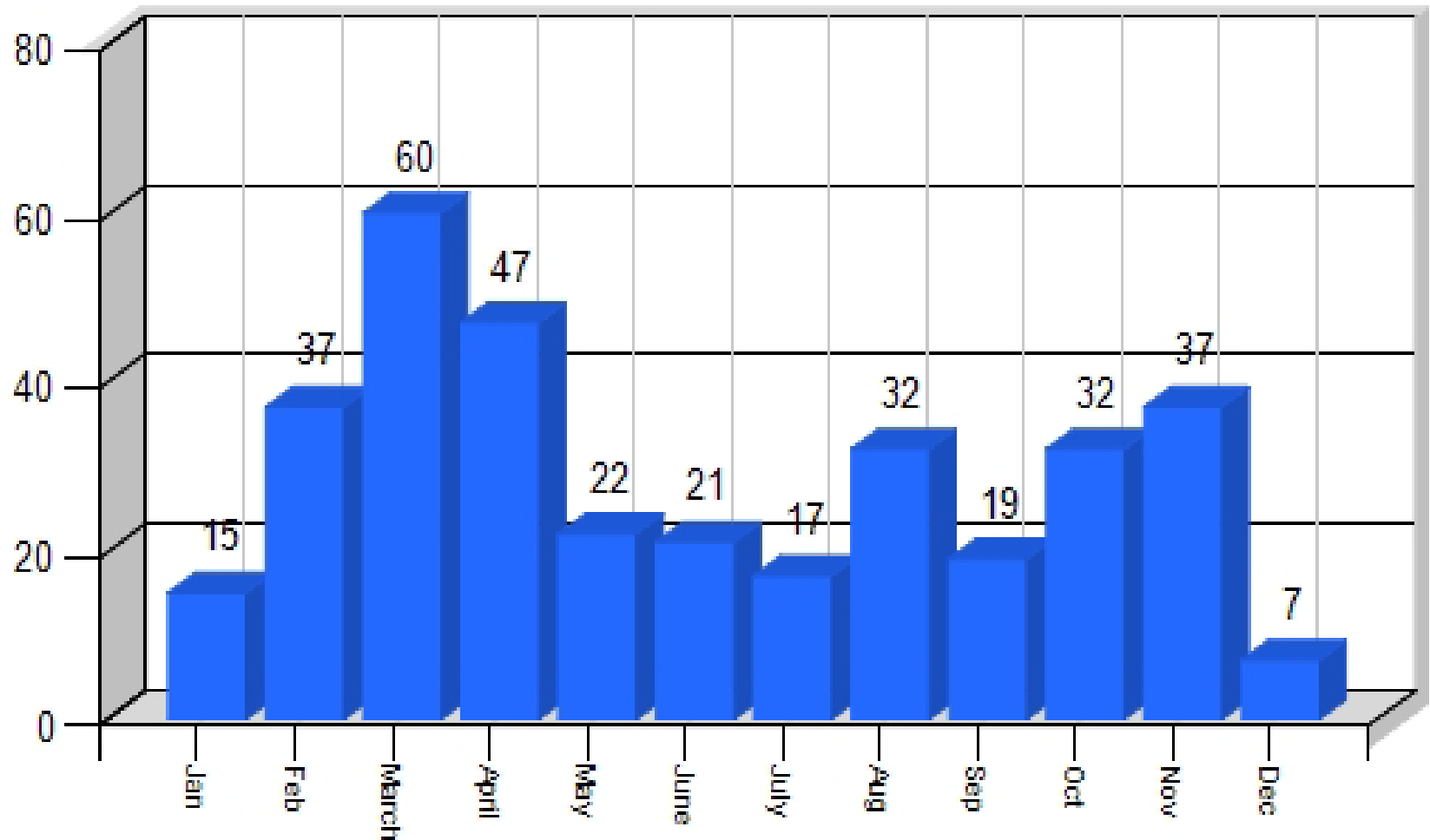
Sideboards

- Skewed Data
 - Not all data sources reviewed yet
 - Regional differences in tracking & self reporting
 - Raw Data -cannot draw conclusions yet
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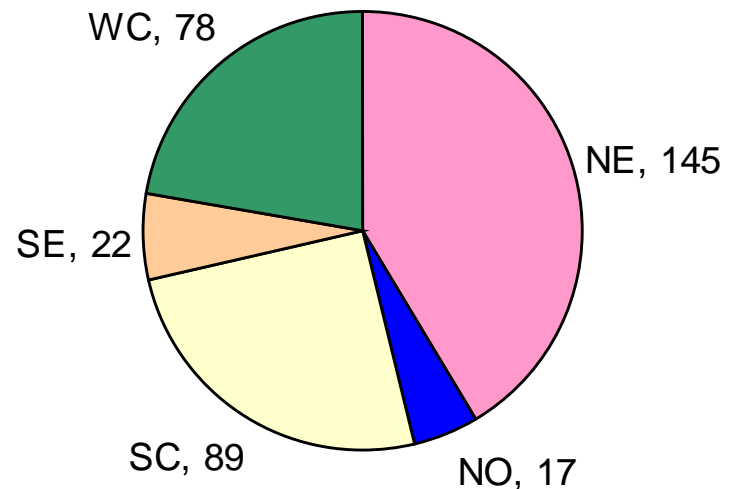
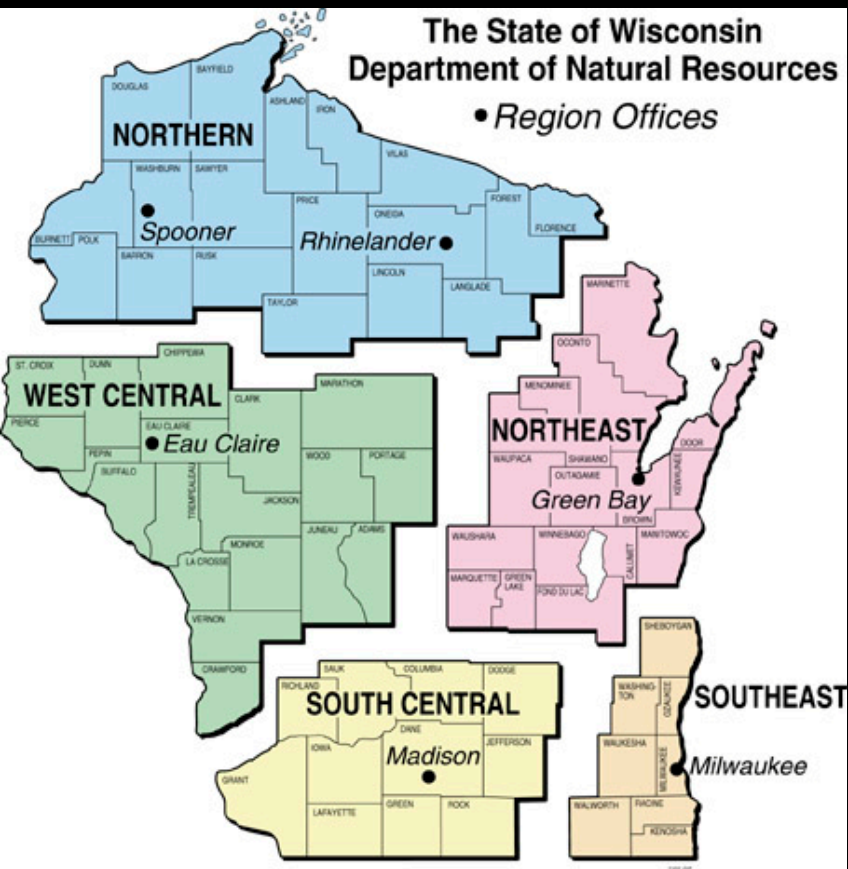
Year (349 Responses)



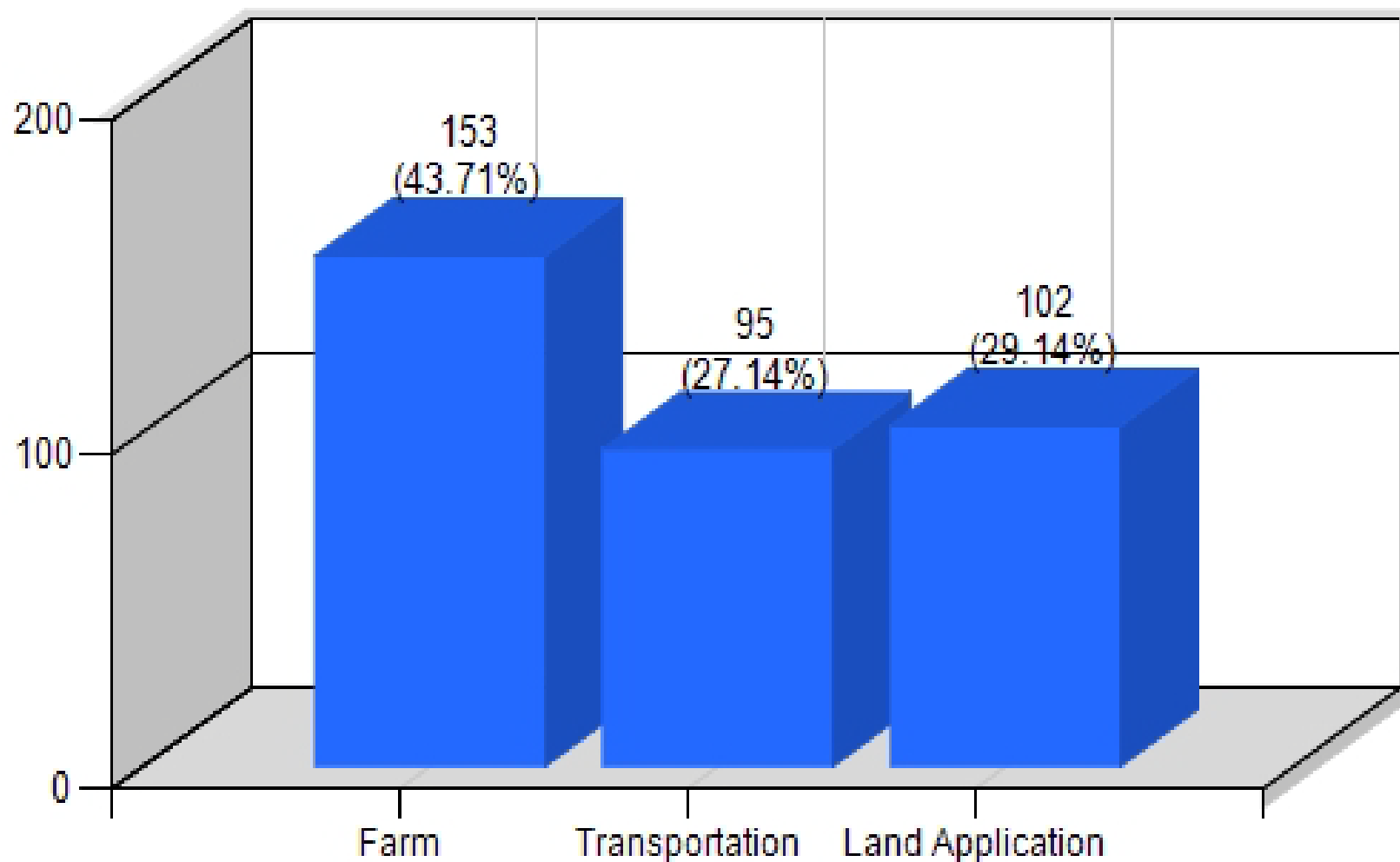
Month (346 Responses)



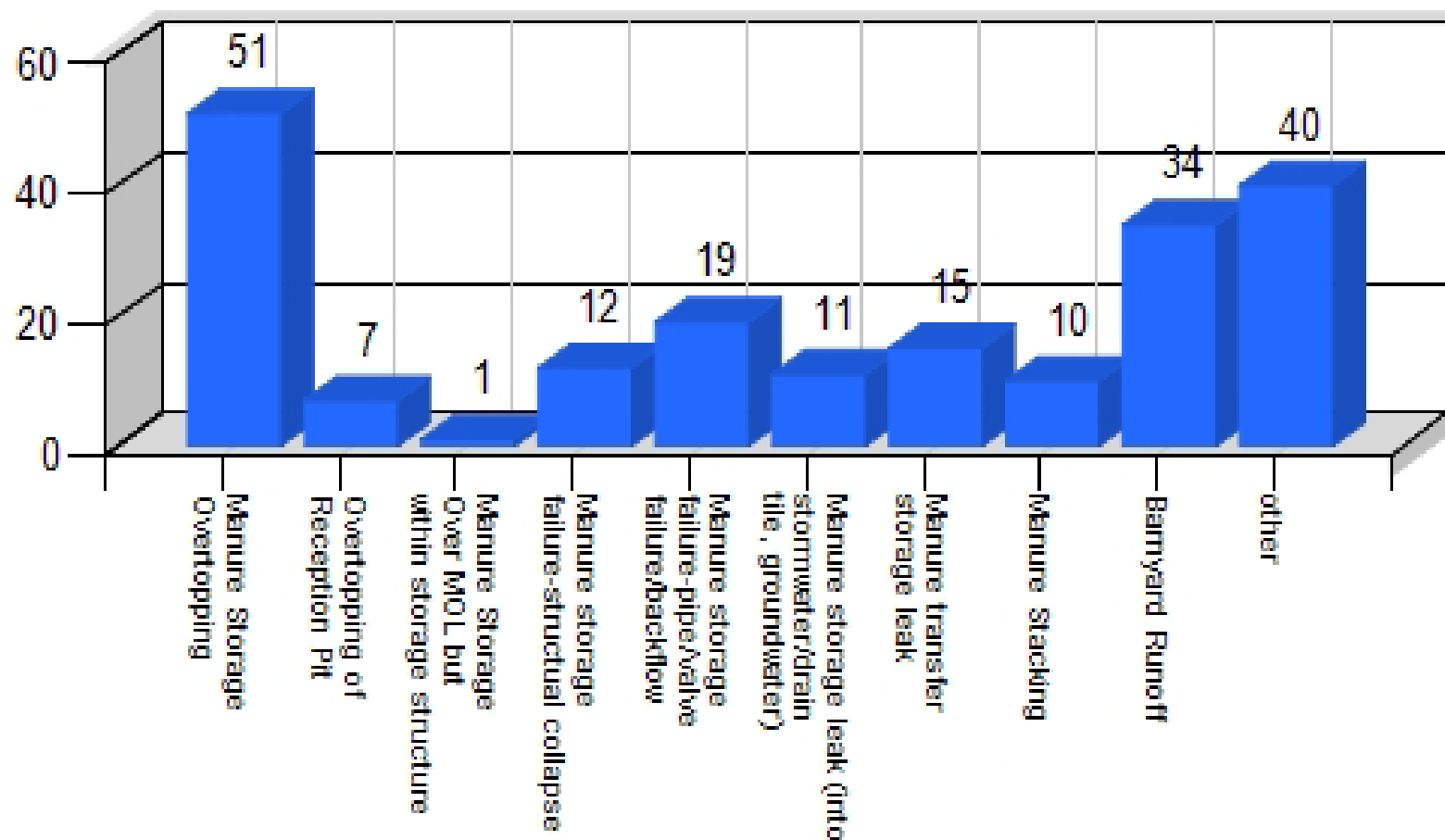
Geographic Distribution of Reported Incidents



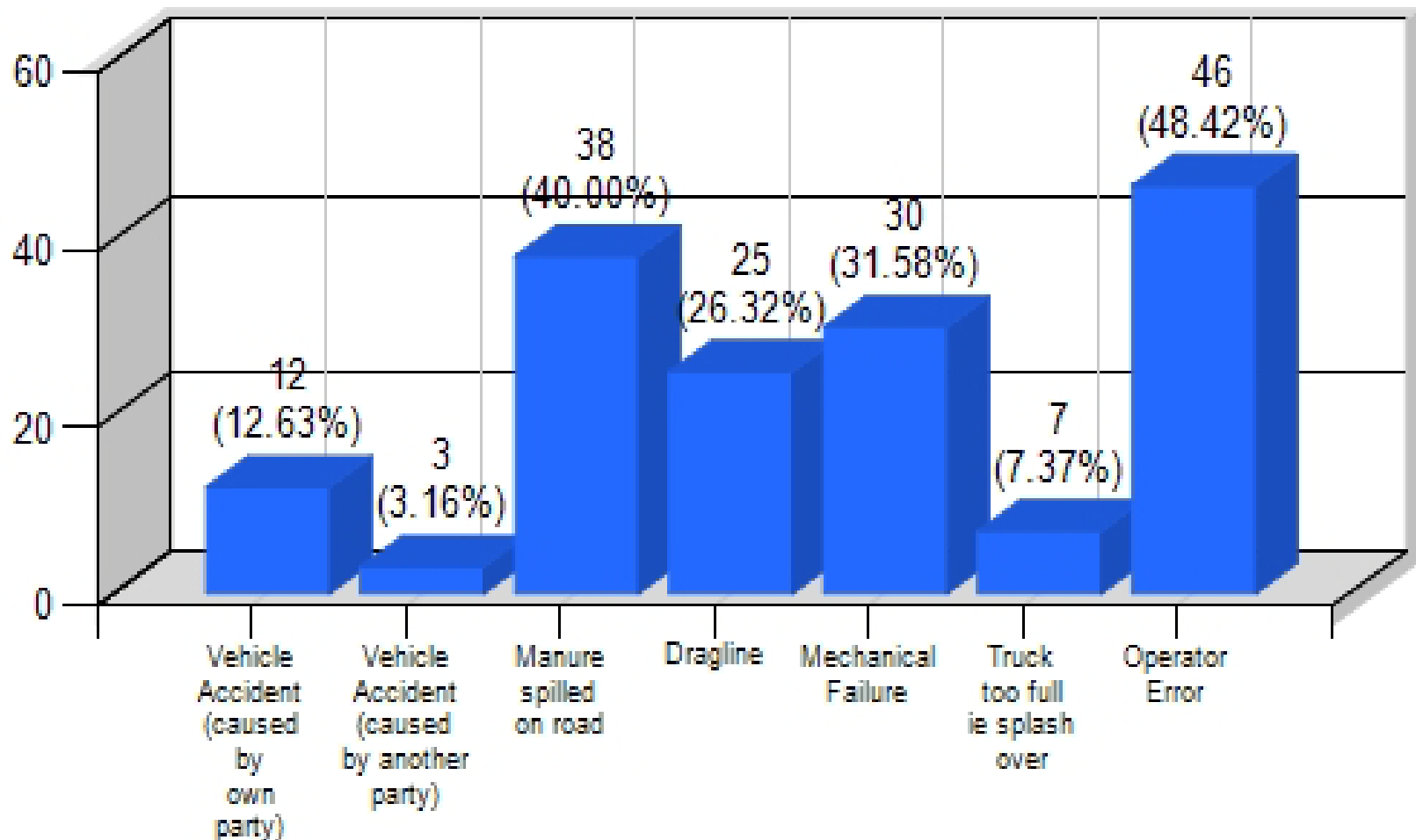
Incident Source (350 Responses)



Incident Source: Farm (154 Responses)

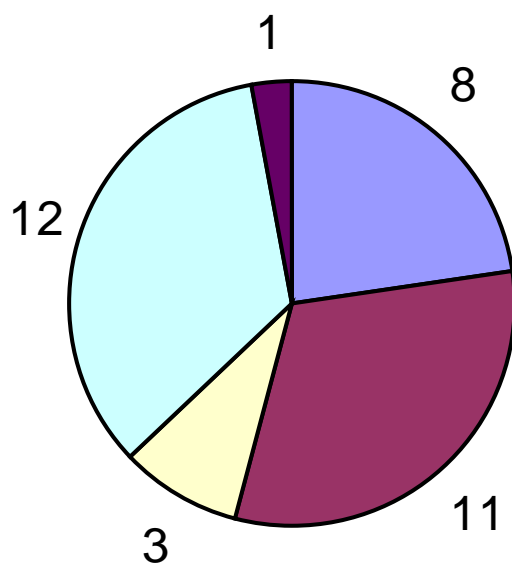


Incident Source: Transportation (95 Responses)



Land Application - NMP

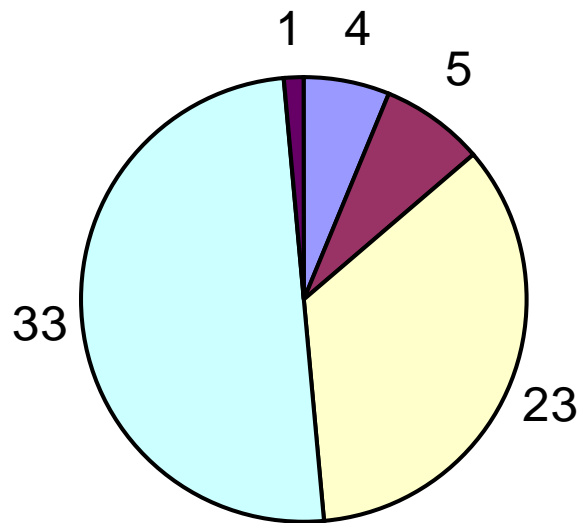
Land Application



- exceeds 590/wpdes permit rate
- ok by 590/wpdes, too much for soil conditions
- Spreading within setbacks (well)
- spreading within setbacks (surface water)
- spreading within setbacks (ground water)

Land Application – Frozen/Precip

Land Application



■ precipitation less than 72 hrs after application

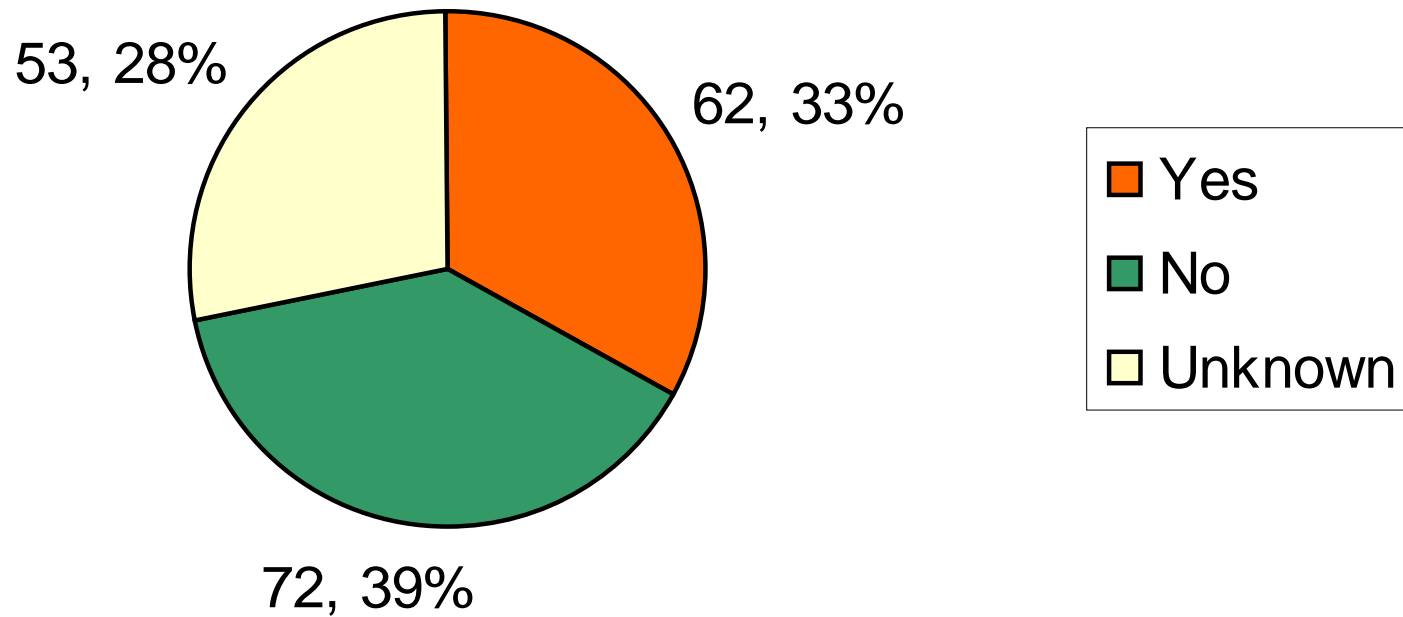
■ precipitation and snowmelt (within 72 hrs)

■ snowmelt (within 72 hrs)

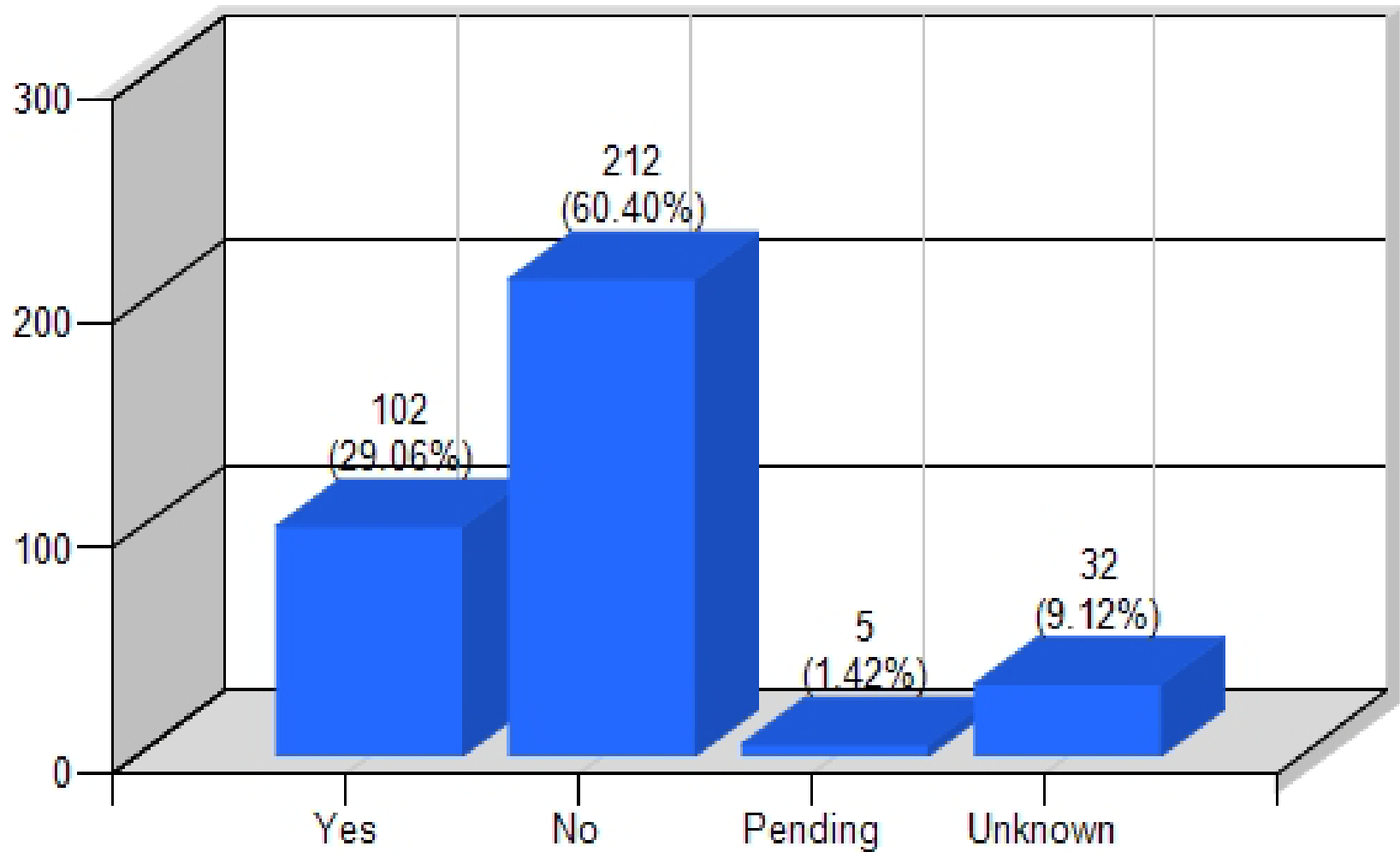
■ frozen and snow covered ground greater than 72 hrs before runoff

■ migration into drain tile or groundwater

Contract Hauler



WPDES Permit (351 Responses)

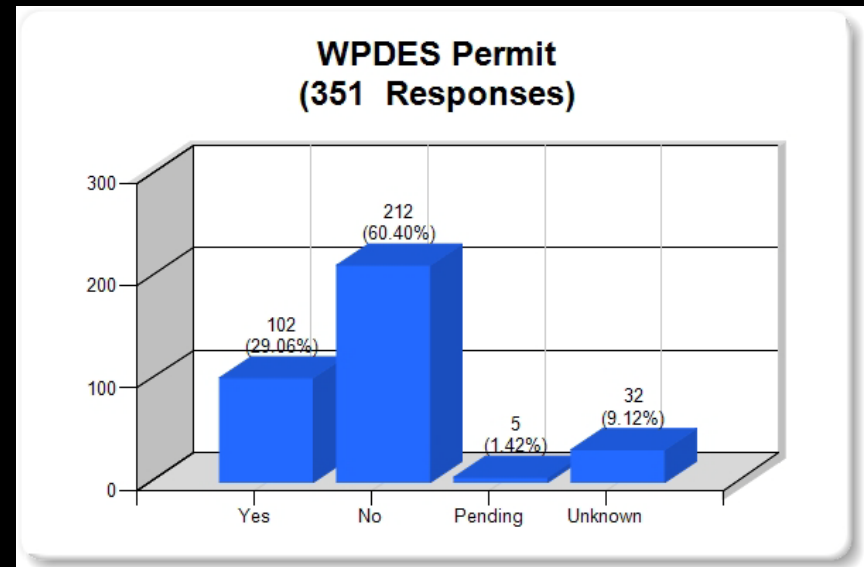


WPDES Permit

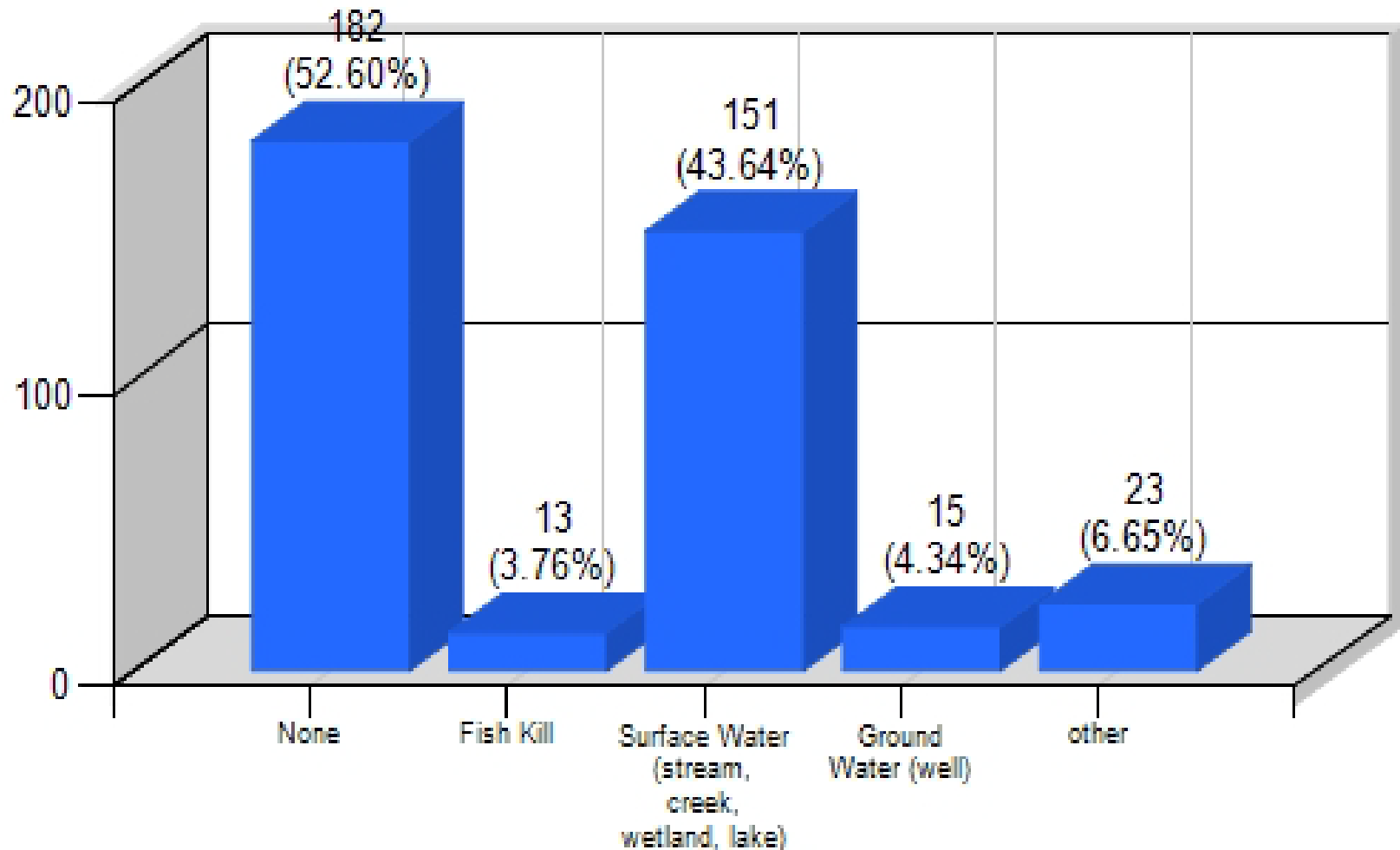
- Unknowns include:
 - Events involving multiple farms
 - Unknown source

Higher % WPDES incidents due to mandatory reporting

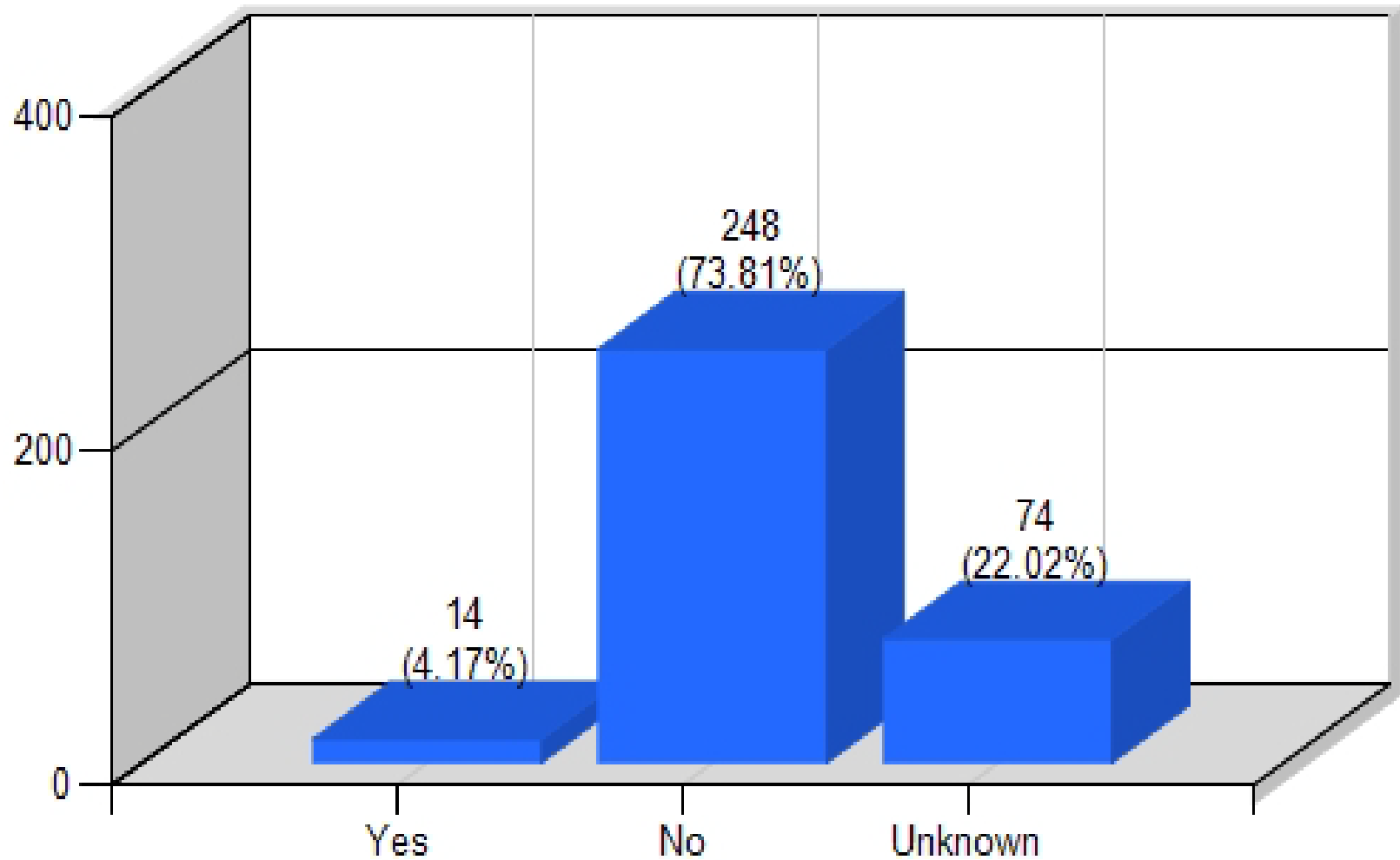
i.e. smaller farms are not required to report, so they may not be reporting



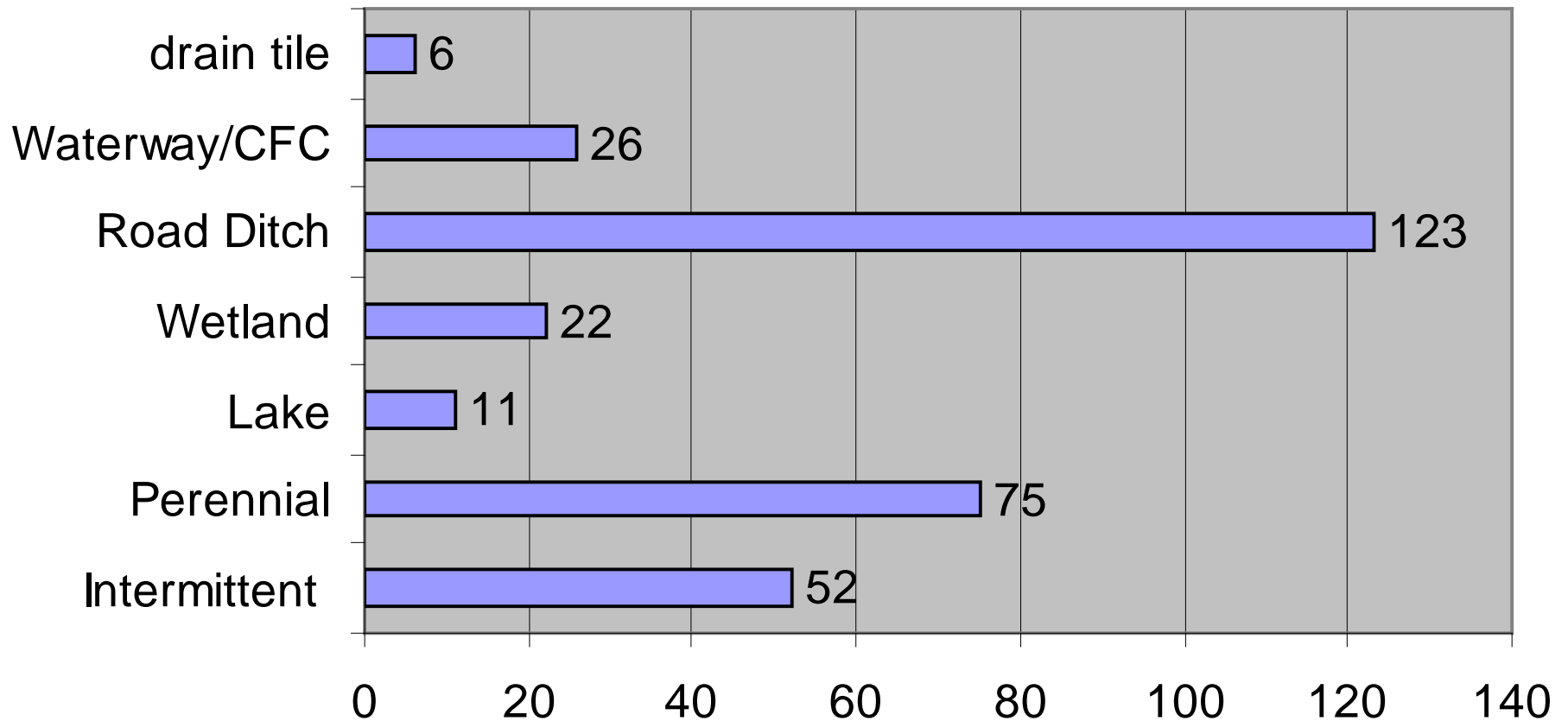
Official Enviromental Impact (346 Responses)



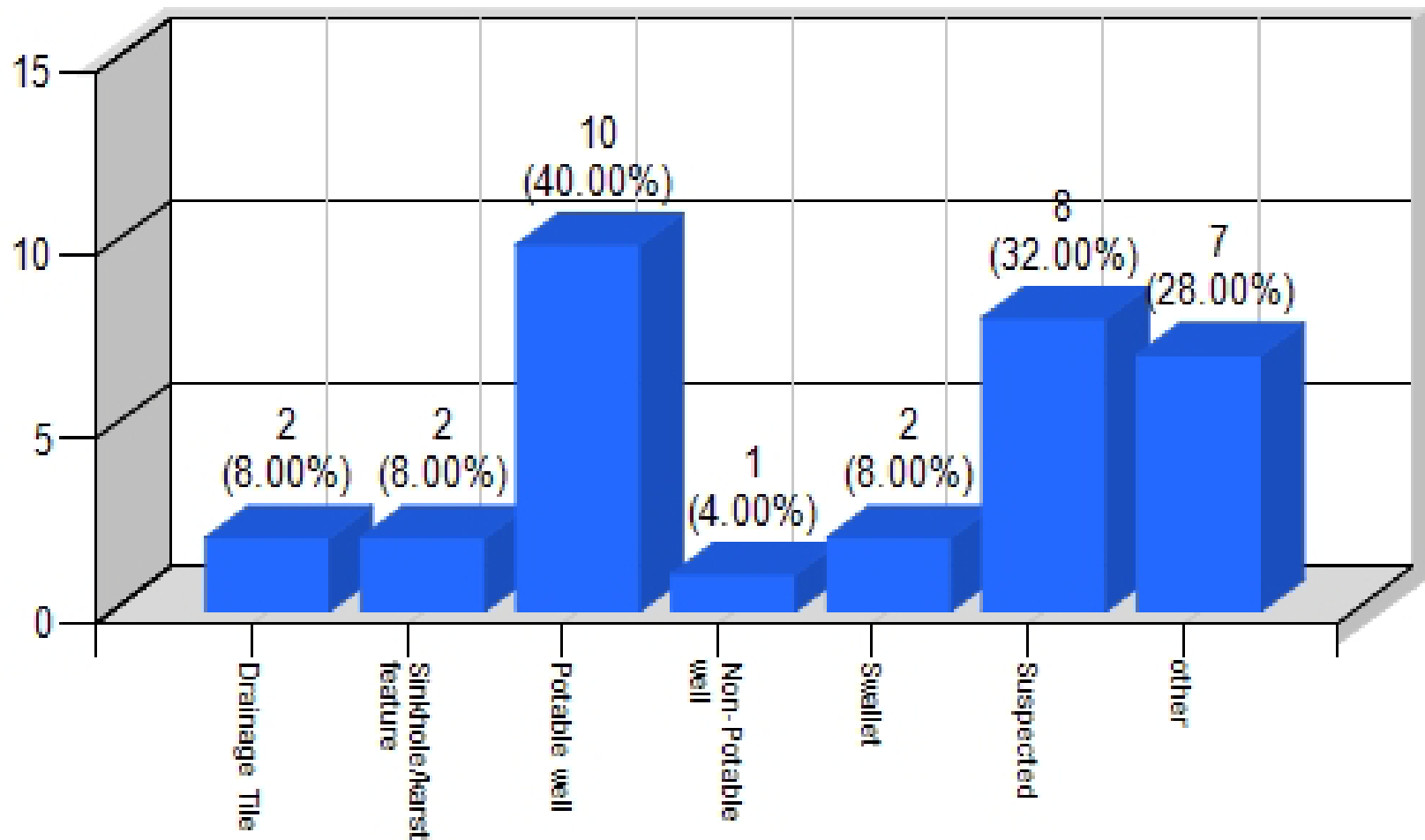
Enviromental Impact: Fish Kill (336 Responses)



Surface Water (254 Responses)



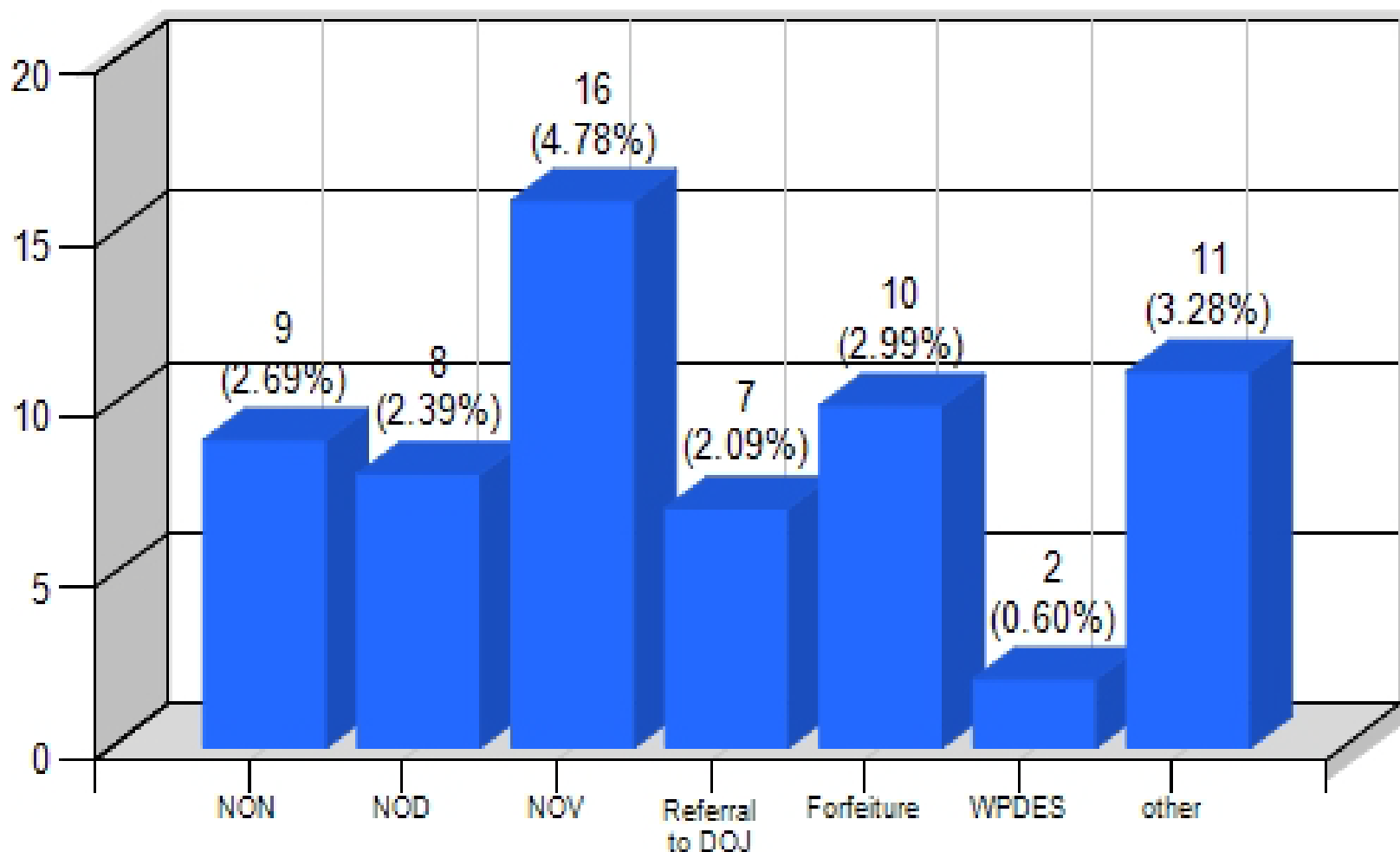
Enviromental Impact: Groundwater (25 Responses)



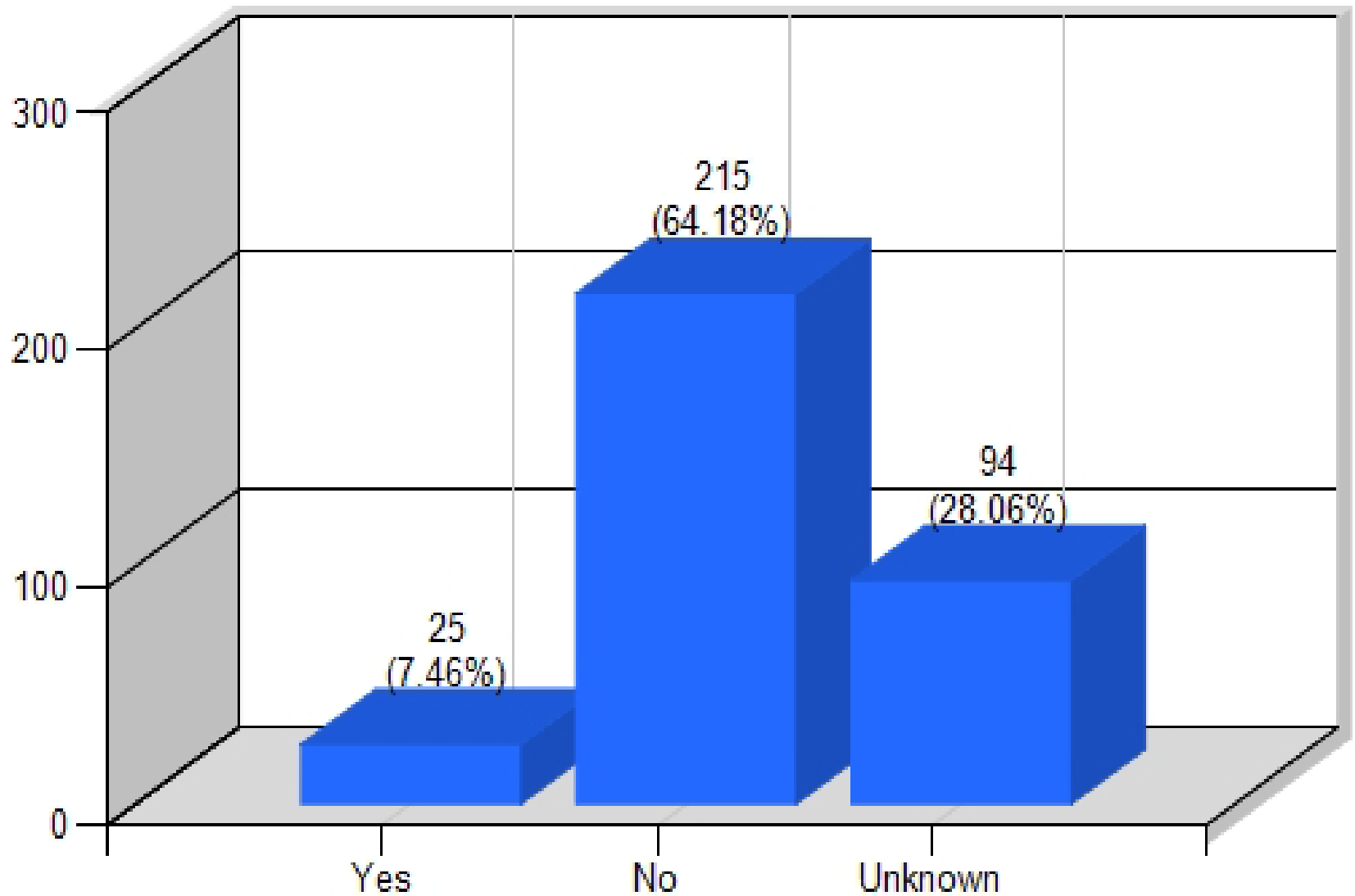
Enforcement



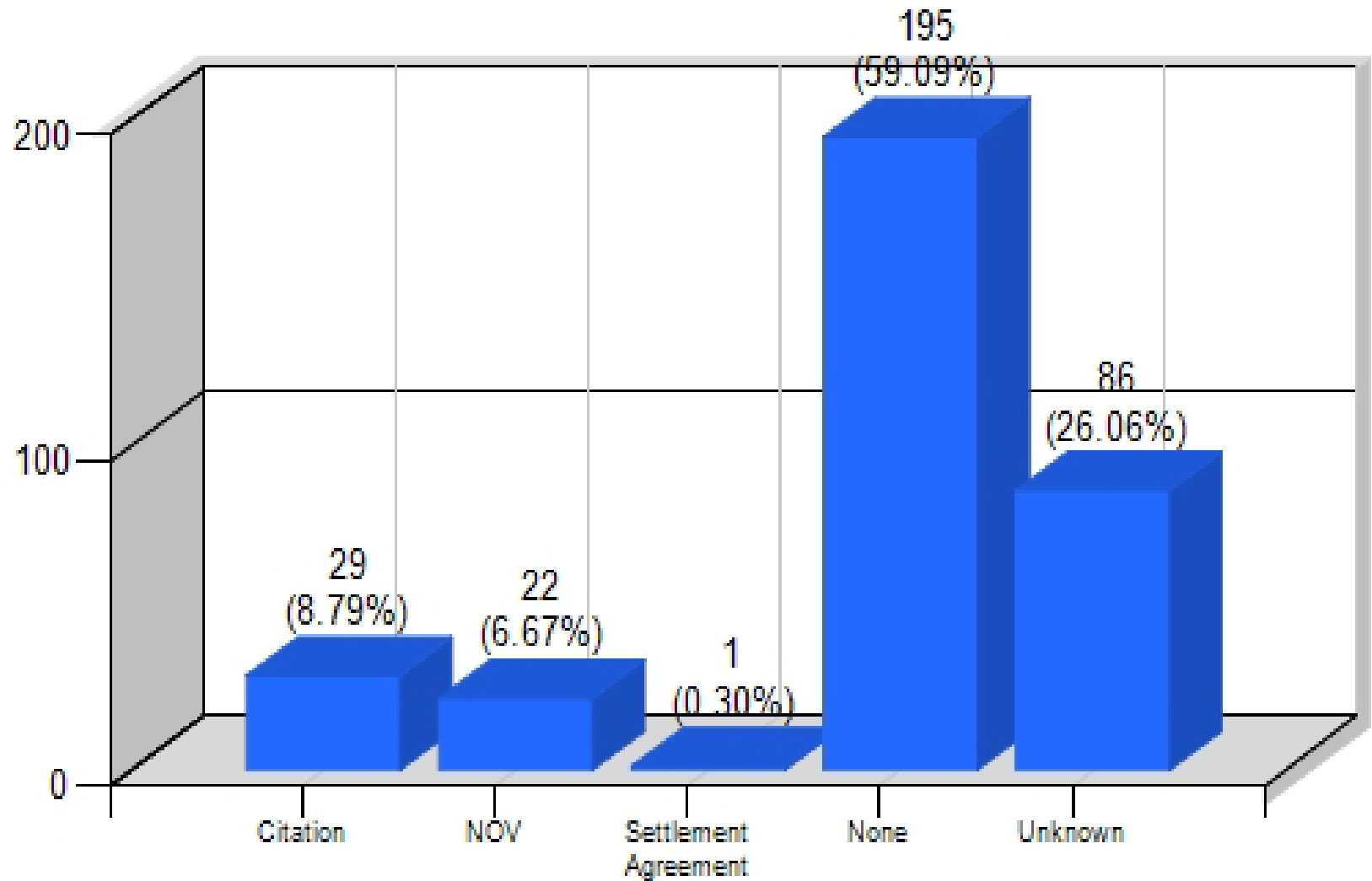
Other enforcement/secondary enforcement (42 Responses)



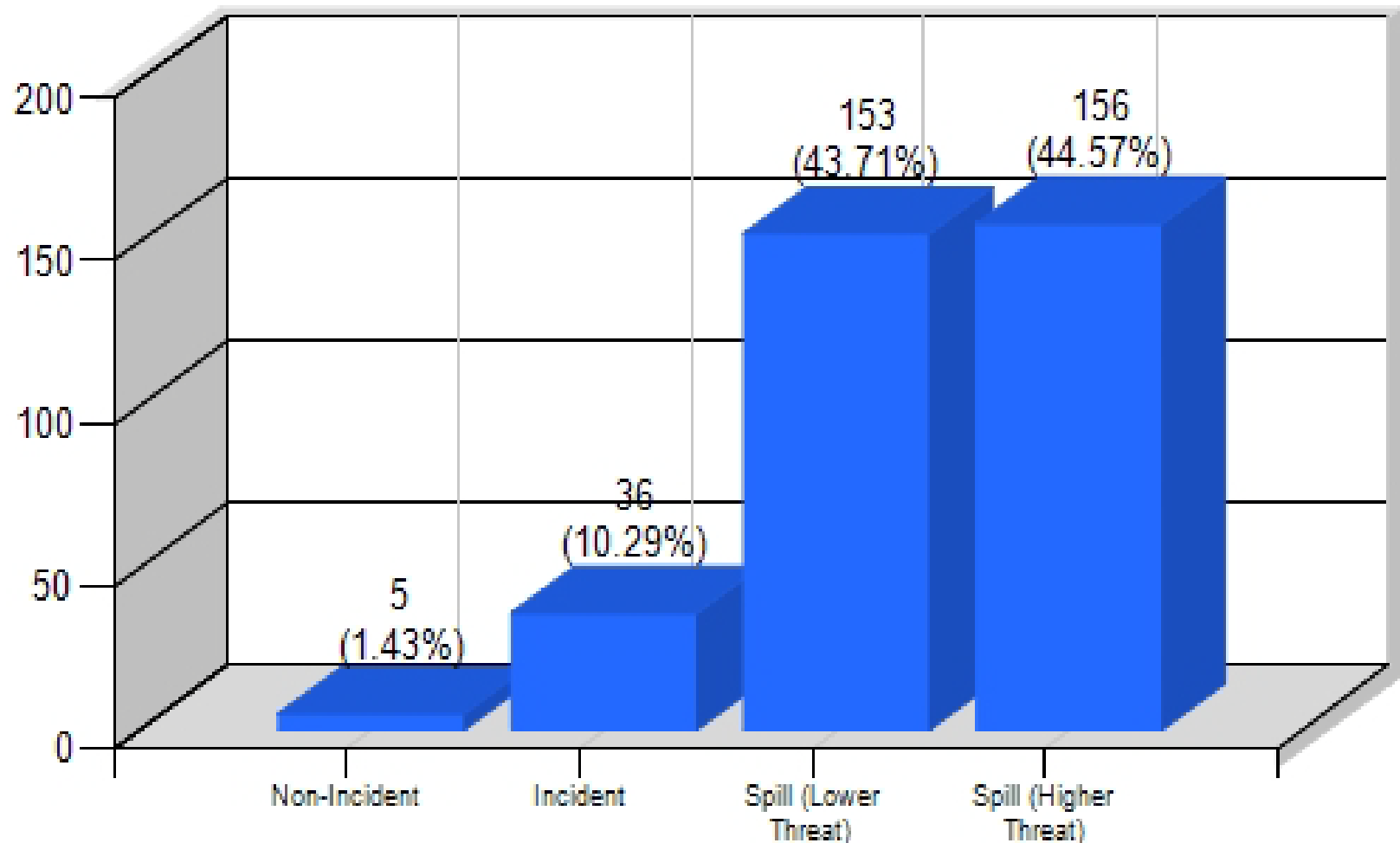
DNR Citation (334 Responses)



County Enforcement (330 Responses)

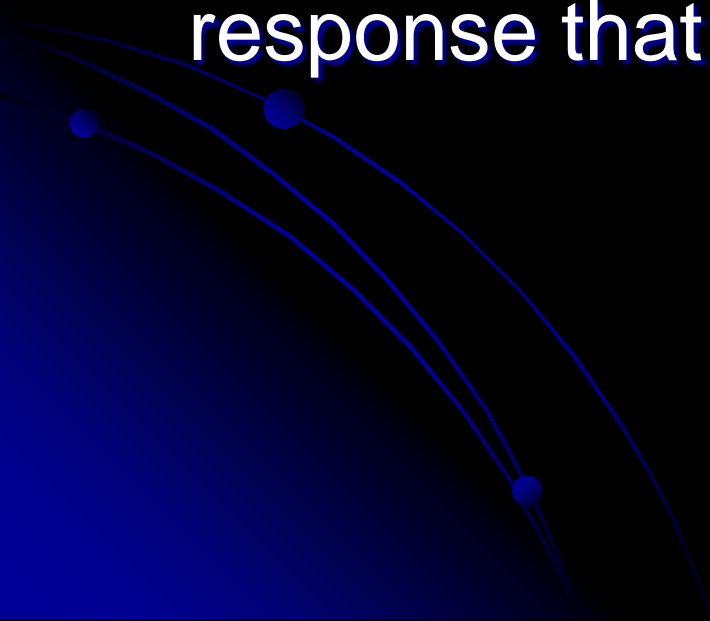


Manure Spill/Ag Incident? (350 Responses)



Future

- Create a better working definition of a spill.
- A ranking system is being considered that will help all parties determine the level of response that is needed to an incident.



Future

- We will continue to add to and refine the database as the project concludes.
- It is hoped that the data gathered will guide the efforts of professional applicators, farmers, CCAs and regulatory staff as we work together to reduce manure's environmental impact.

- This project would not have been possible without the cooperation of WDNR, DATCP and LCD staff around the state, as well as farmers, CCAs and professional applicators.



Thanks for Watching

Any Questions?

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