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Promoting Community Engagement Through Basic User Tutorial of EPA Geospatial Screening Tools

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Table of Contents

Abstract

Social inequalities are riddled with health disparities and outcomes leading toward lower life expectancies. Communities of color, low income, and rural neighborhoods lack the voice and resources to effectively oppose industrial settlement which would likely lead to the release of toxic wastes into the water, air and ground ultimately affecting residential health. Empowering members through community engagement is a relatively new strategic process where researchers are finding mutual benefits in design, implementation, and results. This study aims to identify and promote tools for community engagement within the scope of environmental justice by working with EPA geospatial screening tools and designing a tutorial emphasizing basic usage for a generalized audience. The user-based tutorial provides rationale on why and how to use four screening tools in its most basic form to stimulate awareness, accessibility, and availability for public use. The process of developing the tutorial involves a comparative analysis utilizing secondary qualitative and quantitative data from the EPA screening tools measuring overall usability defined by three categories: user-friendly layout, data literacy, and internal navigation support. The data is then conceptualized into a descriptive PowerPoint to provide the platform for the tutorial utilizing software techniques to enhance learning experience through creative engagement and provide introduction into investigative environmental justice.

Introduction

Problem: The problem that my capstone aims to address is to encourage community engagement toward environmental justice issues by educating stakeholders on availability and accessibility of these four EPA geospatial screening tools: CalEnviroScreen, Toxic Release Indicators (TRI), Risk-Screening Environmental Indicators (RSEI), and EJScreen.

Issues: The issues concerning community engagement stems from lack of public awareness toward the availability and accessibility of EPA screening tools, in addition to the complex and often intimidating user interface associated with the screening tools. These issues remain a critical obstacle in addressing active community engagement toward environmental concern and justice.

Background: All four screening tools are products of the Environmental Protection Agency (EPA) with CalEnviroScreen being specifically a CalEPA product. The purpose of the screening tools is to provide transparent public data that can be used to support decision-making by stakeholders involved in research, policy at the local, state and federal levels, federal and private businesses, community residents, or any organization or individual interested in the data. The data that fuel the screening tools derive from EPA regulations, more specifically, Resource Conservation and Recovery Act (RCRA). “RCRA’s goals are to protect us from the hazards of waste disposal; conserve energy and natural resources by recycling and recovery; reduce or eliminate waste; and clean up waste that which may have spilled, leaked or been improperly disposed of.” (EPA.gov) These are not the only geospatial tools created by the EPA, moreover,

these are the four tools most recognized through Centers for Environmental Health to accomplish their roles in environmental justice toward communities in peril.

CalEnviroScreen focuses specifically on the State of California and compares it with other parts of the state and national data. CalEnviroScreen screens for “pollution burdens” that have 20 indicators in the two categories “pollution burden” and “population characteristics”. According to California’s Office of Environmental Health Hazard Assessment (OEHHA), “ CalEnviroscreen is a mapping tool that helps identify California communities that are most affected by many sources of pollution, and where people are often especially vulnerable to pollution’s effects” (OEHHA, CA.gov). CalEnviroScreen has an algorithm that adds up “pollution burdens” within the areas of interest and maps it out based on the location to provide the “CalEnviroScreen Score” which lets the user know, in accordance to a legend, how the area compares with state regional and national levels.

Toxic Release Inventory (TRI) tracks industrial management of wastes that pose threats to the environment and health of biodiversity (humans, animals, and flora). TRI was created in 1986 and was passed through Congress under the Emergency Planning and Community Right-to-Know Act (EPCRA) after a series of global and national events concerning industrial mismanagement resulted in deaths of community members. According to the EPA, TRI is a mandatory program and has its own compliance and enforcements (EPA.gov, 2020). TRI’s purpose is to collect and provide transparent public data from industries sectors that must report annually to the EPA on how they managed their waste, be it from, release, recycling, energy recovery and/or transported to treatment sites. The information released annually helps policymakers, government agencies at local, state and federal levels, and also community

members make better decisions on the threats industries pose to health and environmental hazards.

Risk Screening Environmental Indicators (RSEI) is an extensive modeling screening tool that incorporates information from TRI to determine "RSEI Scores" measuring threats to health and the environment. The specificity and amount of data that can be interpreted and analyzed through RSEI makes it the most complex tool of the armamentarium provided from the four, however, because of the complexity it holds great investigative power that can turn the tide in decision making. The RSEI score is a common and most widely applicable metric that accounts for the size of chemical release rate and transport of the chemical through the environment, the size and location of the exposed population and the chemical's toxicity. RSEI scoring metrics are meant to be compared with one another, in example, a chemical that is 5 point greater than another chemical suggests that the former has 5 times more risks to health. According to EPA.gov, "A RSEI Score is a unitless value that accounts for the size of the chemical release, the fate and transport of the chemical through the environment, the size and location of the exposed population, and the chemical's toxicity" (EPA.gov, 2020).

Lastly, EJScreen allows users to investigate a specific address, city, or zip code. EJScreen measures indicators that affect health through environmental, demographic, or environmental justice indexes which can then be compared to national, state, or local regions. According to the EPA this tool aids in environmental justice investigative techniques and screening for environmental and demographic indicators.

Project Description: The project aims to deliver a way to navigate through the four EPA geospatial screening tools in a manner that can be used by the laymen. The purpose of utilizing the four tools is due to the common usage throughout the fieldwork experience with Centers for

Environmental Health which employs these tools to investigate and understand industrial impact on communities in partnership. The barriers that are presented through these screening tools include lack of a friendly user interface that can be understood at the most basic level, and lack of community engagement due to awareness that these tools exist. The project is designed with creating a basic level of comprehension that can be understood by those who do not have any environmental justice (EJ) knowledge or background and to those who have advanced understandings of EJ. The presentation is tailored through Microsoft's PowerPoint with advanced levels of design to keep viewers engaged while maintaining ordered structure of successive tools that can complement investigative techniques with tips and learning outcomes.

*Justification***:** The rationale behind this project is to empower community members with publicly accessible data on their communities which can be compared across local, state, and national levels. Corporations and industries have continued to deliver injustices to colored or low-income communities because of reduced upkeep and less regulated monitoring resulting in preventable pollution and unnecessary community exposures to disadvantaged communities. "Over the past decade, civil rights leaders, sociologists, policy makers, and scientists have argued that biases within environmental policy making and the regulatory process, combined with discriminatory market forces, have resulted in disproportionate exposures to hazardous pollution among the poor and communities of color. Underlying these claims is the belief that such exposures may play an important role in the complex pattern of disparate health status among the poor and people of color in the United States" (Morello-Frosch et al., 2001). By showcasing these EPA tools and informing stakeholders on how to navigate these often complex and heavily- jargoned comprehensive tools, we can advocate and change the narrative on how we tackle current and future problems and hold industries accountable for their actions through

education and community engagement. Community engagement in an emerging strategy used to empower communities through education that guides community based participatory research eventually leading toward the goal of policy-making in the interest of the community. “CE [Community Engagement] has also been advocated as a tool for providing a ‘voice to the voiceless’ and therefore is considered valuable for tackling health inequalities (13). Disadvantaged groups often experience health inequalities and bear a disproportionate burden of disease as a result of structural, social, and cultural barriers” (Cyril et al., 2015).

Scope of Work/ Methods

Center for Environmental Health is a non- profit organization headquartered in Oakland, CA with two satellite offices in the East Coast—Washington, D.C. and North Carolina. Michael Green, the acting CEO, founded CEH in 1996 and many of the battles won involved litigation of private sectors under the Safe Drinking Water and Toxic Enforcement Act of 1986, or Prop 65. This is where most of the funds besides grants and donations help keep the NPO operational, through advanced litigation working mainly under the scope of Prop 65. CEH's mission is to safeguard people from the effects of toxic chemicals that are manufactured or leaked into our communities by working with "communities, consumers, workers, government, and private sector to demand and support business practices that are safe for public health and the environment" (CEH, 2020).

The scope of my practice as a fieldwork intern at CEH under the Illegal Toxic Threats team (ITT) includes: working with local community health agencies to establish coalitions on removing toxic chemicals off store shelves, acting on behalf of CEH as a liaison to provide testimonial statement for CalGEM's reformation of laws and regulations surrounding urban drilling, and more importantly to this capstone project-- creating a living tutorial that encourages community engagement toward environmental hazards by bringing forth four EPA geospatial screening tools most used by CEH in its investigations on cases toward community environmental justices. My work is unique in that it takes the perspective of a laymen in showing basic usages and explains in simple dictation how and why users would want to utilize the resource as an investigative tool. The project initially developed with one of CEH's partners in mind, East Yard Center for Environmental Justice, due to community concerns of elevated hex chrome pollutants, but was soon adopted as a universal asset that can be applied to any partners

of CEH and internal teams that can benefit from the knowledge of navigating and understanding how to use these screening tools.

Methods

The first phase involved obtaining experience navigating and understanding each of the four EPA geospatial tools. Data collection involves secondary data collection both qualitative and quantitative from CalEnviroScreen, RSEI, TRI and EJScreen. A collective comparison analysis is assessed via homepage and models of all four geospatial screening tools. Qualitative data involves navigating the tools involved using a personal location where synthesis of information began until advanced knowledge of all four tools developed. Quantitative data gathering was discerned from the numerical data involved with each separate screening tools unique scorecard ratings based off facility data or indicators that contribute to health risks. Once a mastery comprehension of how each of the EPA geospatial tools are configured, the transition to phase II initiated.

The second phase includes secondary data aggregation from the preceptor, program director of illegal toxic threats team, in this instance it is qualitative data from archives of communication (verbatim & paraphrased) between community partners involved with environmental health concerns. Two partners in particular are best fit to benefiting from the educational aspect that the tutorial provides for advanced community engagement: East Yard Centers for Environmental Justice and a few individuals who raised public and municipal concerns in Paramount, CA; referred to as EYCEJ and Paramount respectively. During phase II, the design and script for the tutorial guide had EYCEJ in mind as the audience with location specific screenshots of infographic slides detailing how to navigate the tools.

The third phase involves designing and re-designing the PowerPoint presentation (*see Appendix B, C, D, & E*). The presentation involves the use of secondary qualitative and quantitative data derived from the four EPA geospatial screening tools. The framework of the presentation includes: framing a narrative introducing what the tool is and why the tool is useful, dividing the four EPA tools into subsections with beginning to end tutorial on usage, attention grabbing and stabilizing techniques through PowerPoint, strategic layout of subsections based on psychological understanding of maximum learning potential (Bradbury, 2016), formatting color scheme and text to reflect CEH's theme on their webpage, and making text guides easy to follow and maintaining common literacy.

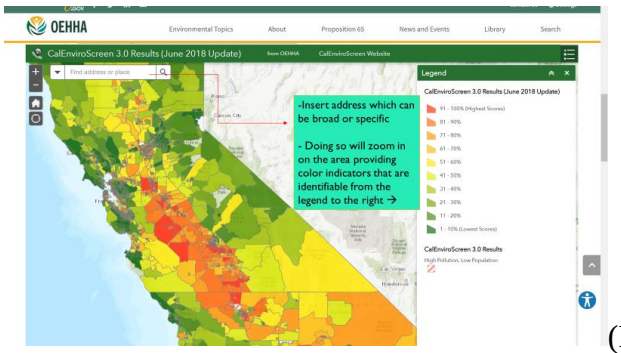
The final phase, phase IV, involves presenting the PowerPoint tutorial to either the partners associated with EYCEJ and/or Paramount. Following the presentation, a primary qualitative questionnaire will be provided to all participants involving 5 questions (*see Appendix A*) with room to add additional qualitative descriptions. This will be used to improve the presentation if necessary, for future use. Due to the current situation with regards to the resurgence of the novel Coronavirus- 19, all scheduled presentations with EYCEJ has been put on pause. The questionnaire was never presented to any parties for presentation feedback. However, the presentation and questionnaire will be provided to CEH for their use at any time after normalcy resumes.

Findings & Results

The results of this study will be subjective to the author's understanding of the four EPA tools used within the Centers for Environmental Health and how they relate to initial exposure for novice users. The analysis of each individual tool will be premised around East Yard Environmental Justice's headquartered location which was the basis of the presentation's geographical reference point. The findings involve general data accessibility and comprehension provided basic understanding of environmental justice with assumptions of interest in pursuing any form of community engagement. Findings are measured through three subjective categories determined by author to be most: user-friendly layout, low data literacy, and internal navigation support. User friendly layout is essential to usability and enhanced user experience (Chiu et al., 2016). While having low data literacy and data inclusion has greater appeal toward a general audience. (Deahl et al., 2015) And internal navigation support allows users to have reference points to guide while using the geospatial screening tool (Berendt et al., 2005).

CalEnviroScreen

a. User-friendly layout: Easily accessible under Google search engine with the search leading to a direct access to CalEnviroScreen. Geospatial screening tool is located on homepage where access is immediate. *See Appendixes B 1-5.*



(Figure 2, in Appendix B)

b. Data literacy: Literacy is low and easy to follow. Hyperlinks are provided for each indicator allowing the user to individually assess what the indicator entails and why the indicator is included in CalEnviroScreen. The amount of information provided helps users understand what the data values mean and how they contribute to CalEnviroScreen's overall score. This level of comprehension lowers the data literacy in favor of novice users who have a wealth of information within the screening tools framework.

c. Internal navigation support: The hyperlinks provide navigation support as well as descriptive information on the indicators aiding to user experience. Within the webpage there is also a hyperlink "Using CalEnviroScreen" tab that provides resources to aid in navigating the screening tool in further details. The surplus of resources to aid user navigation within the internal framework of CalEnviroScreen is designed with novice users in mind.

RSEI

a. User-friendly layout: The homepage of RSEI has an overwhelming amount of information and resources that are not user friendly and strikes mild intimidation. Navigating the site involves a mild learning curve and getting toward the screening tool requires digging around. The layout is intended for users who have some experience given the context and the wealth of information.

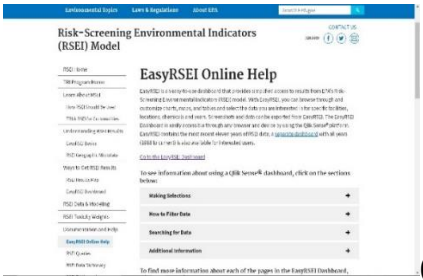
   The usability of the RSEI model is more difficult than navigating the webpage as there are more tabs and literature to comb over before understanding how to properly use the model. The graphs and statistics also have a learning curve for novice users. See Appendix C, Figures 2-5.

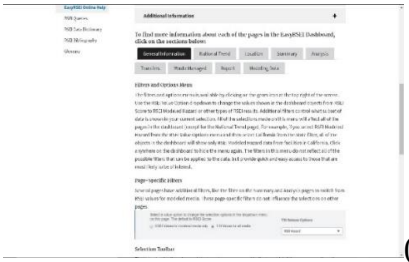

(Figure C-4)

(Figure C-5)

b. Data literacy: Data literacy associated with RSEI is high. RSEI's available data can be complex with a wide spectrum of facilities operating within the area, chemicals, charts, and graphs that require some research, and comprehension of waste management and data reports written by officials. The learning curve is steep with RSEI.

c. Internal navigation support: Under the "Learn About RSEI" sidebar, there are plenty of resources with video tutorials on navigation and context of RSEI however, finding these videos and complete comprehension of the videos takes time. An example of the context of the navigation support is provided on Appendix F, Figures 1-3.



(Appendix F-1)

(Appedix F-2)

TRI

a. User-friendly layout: TRI provides a user-friendly layout with a brief section introducing TRI and how it can be used to support environmental investigative efforts. The TRI model is also incorporated on the homepage where it can be utilized within the same screen. This is a new feature that has been recently updated mid-April 2020 which

suggests that the developers are highly aware of the necessity to be approachable by all users. There are also options for more advanced users to utilize the TRI Search Plus model which is an extension for more advanced settings.

When using the model there have been moments of lack of responsiveness which factors against usability.

b. Data literacy: There is a high data literacy associated with TRI. The data available on TRI is abundant and can be complex with a steep learning curve which involves many graphs, statistical comparisons, chemical formulas, various agencies, codes and permits that are made available.
c. Internal navigation support: Video support for TRI navigation and explanation with examples are provided directly within the internal framework of TRI's homepage. There are ample videos provided by EPA on how to use TRI with examples on each of the tabs that the model equips.

EJScreen

a. User-friendly layout: EJScreen has a user-friendly layout on the homepage where you can dive into the screening tool or learn more about it through obvious sections demarcated on the homepage. The screening tool itself is a map where reports are shown through a simple bar graph and can be compared between local, state, and federal levels. The simplicity in the tool contributes toward a high user -friendly layout.
b. Data literacy: There is a low data literacy associated with EJScreen. Indicators are provided with details on supplemental pages within the internal framework.
c. Internal navigation support: EJScreen provides several videos on how to navigate the screening tool as well as low literacy descriptive literature detailing the indexes for

environmental justice and provides why. There is ample internal navigation support provided by the developers of EJScreen.

Discussion

There are no one tool that has a one size fits all approach, rather the tools should be used in adjunct with one another. More often, it is the basis of understanding which tools are appropriate for any given scenario and knowing that these tools can provide investigative power toward community engagement on environmental justice.

What I have observed through the comparative analysis is that less cluttered and complex geospatial tools makes it more user friendly and easier for non-academically trained individuals to comprehend data presentation. This makes geospatial tools involving maps a better initial screening tool for community level engagement because of the association with familiarity of geolocation. The interactive maps of EJScreen and CalEnviroScreen provide ample data to the indicators allowing new users to understand what the screening tools offer.

Research Implications

For future research adding more layer and depth to the ongoing presentation, a tutorial presentation can cater toward an intermediate- advanced audience showing real case/ active investigations on facilities that are breaching the Clean Air/ Water Act and by going through the screening tools to find strong leads toward environmental justice. This would apply theoretical and real skills navigating through the four EPA geospatial screening tools frequented by CEH.

Program Implications

Due to the current novel Coronavirus- 2019 many obstacles and delays have been put into motion. This has inevitably prevented the live or broadcasted presentation to take place between Centers for Environmental Health and East Yard Center for Environmental Justice. Thus, I was unable to distribute the questionnaire and analyze the results. EYEJ has a population of n=46 personnel that would benefit from the tutorial presentation.

Policy Implications:

It would serve community engagement knowing that these screening tools exist. EPA geospatial screening tools are used most often by policy makers, environmental activists, private and federal sectors specializing in environmental/ waste management, and other specialized individuals. To see more widespread and common usage would increase community engagement because it would educate the general audience as to what we are breathing, drinking, eating, and living next to. Clean Water & Air Act should further the agenda to publicize and shift the narrative to provide greater availability and accessible data that does not intimidate non-specialized individuals. A suggestion to this would be to allocate budget toward advancing greener policies by the EPA that hold industries more accountable and conscious about public opinion. By developing policies that require industries to publicly broadcast benefits and resources of geospatial screening tools sponsored by the EPA we can get the public awareness and potential users as they stumble across through either website curiosity, intentional investigations, or educational purposes. It can be as simple as providing visible educational sections through their home website that provides brief introductions and explanation toward EPA geospatial screening tools with links and resources directing traffic toward EPA publicly available tools.

Conclusion & Recommendations

This capstone's purpose is to identify publicly accessible EPA screening tools to encourage community engagement toward environmental justice with four EPA geospatial screening tools: CalEnviroScreen, TRI, RSEI, & EJScreen. These are the four most sought out tools used at Centers of Environmental Health to investigate facilities that are harming the environment and its inhabitants. By understanding and utilizing these tools the hope is that communities across the nation can empower themselves with education and data. This could lead to a progressive and sustainable future where communities change the narrative on how companies can and should operate within the frameworks of public health and safety.

To promote this future, more awareness must be drawn to the strength of the EPA geospatial tools. I created a presentation tutorial on the basic usage and overview of how to use these tools with one of CEH's community partners East Yard Center for Environmental Justice in mind. The capstone's scope of work can be dissected into four phases: initial learning and comparative analysis of the four geospatial tools, data aggregation from the community partner EYCEJ, designing of the EPA geospatial tools presentation tutorial, and lastly the presentation of the PowerPoint tutorial and feedback through a questionnaire at the end of the presentation.

What I have learned through the comparative analysis of mainly secondary qualitative and quantitative values is how complicated and intimidating these tools can appear for those who have novice understanding of environmental justice. The heavy literature, graphs, charts, and chemical formulas have high literacy content in RSEI and TRI that can discourage user experience. However, EJScreen and CalEnviroScreen both adopt interactive mapping systems in their models allowing for faster user comprehension and more manageable usability for novice users. All tools provide resources that are within the internal framework of the homepage and screening tools, however, RSEI and TRI requires more explorative searches to find basic instructions and guides. This can be problematic when paired with the already overwhelming homepage and high-density literature. Future recommendations would include

increasing usability by reducing traffic on webpage and by aggregating all resources in one area with clear demarcation of where to access these resources. In RSEI and TRI there were considerable time spent clicking through multiple links to find sufficient resources to provide stronger frame of context on how to efficiently navigate the model.

Furthermore, no one tool is better than another as they each provide their own style and investigative strengths and weaknesses. It is recommended that these EPA geospatial tools be used in adjunct to one another. For future research on the effectiveness of geospatial tools and community engagement, more demonstrations of utilizing multiple EPA based geospatial tools can be done to further provide communities with educational resources. More intermediate and advanced tutorials can cover the more in-depth usage of TRI and RSEI as this presentation only covered the bare basics. A pilot program funded by a university grant or NIH can be done to highlight the investigative power EPA geospatial tools have to offer in identifying and resolving environmental justice issues. Unfortunately, due to the current pandemic, I was not able to hold a live presentation which was initially planned; thus, the end presentation questionnaire was not distributed for feedback and future modifications.

Appendix A.

Post-Presentation Questionnaire

1. During the PowerPoint presentation, how easily were you able to understand and follow along?
    a. Extremely likely
    b. Likely
    c. Somewhat likely
    d. Not likely
2. How confident are you in navigating one of these screening tools on your own AFTER viewing the PowerPoint?
    a. Very confident
    b. Confident
    c. Somewhat confident
    d. Not confident
3. Out of the four EPA screening tools which of the four tools is most useful to you?
    a. CalEnviroScreen
    b. RSEI
    c. TRI
    d. EJScreen
4. How likely will you be to refer this PowerPoint to others that are interested in environmental justice?
    a. Very likely
    b. Likely
    c. Somewhat likely
    d. Not likely
5. On a scale of 1-10 please rate the effectiveness of the presentation. (10 being highest effectiveness rating)

    1 2 3 4 5 6 7 8 9 10

Additional comments:

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Appendix B: CalEnviroScreen Figures 1-5

Figure B-1

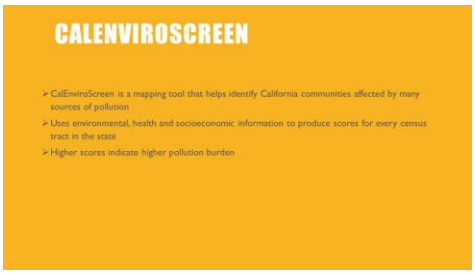
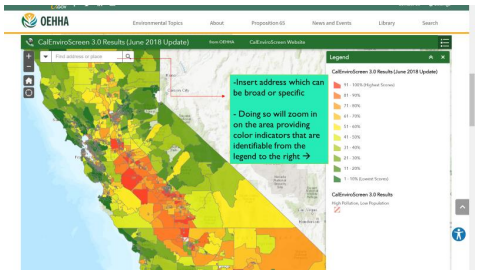


Figure B-2



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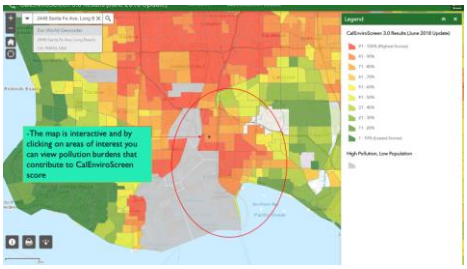


Figure B-4

Figure B-5

Appendix C: Risk- Screening Environmental Indicators (RSEI) Figures 1-9

Figure C-1

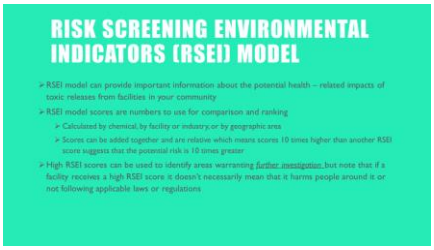


Figure C-2

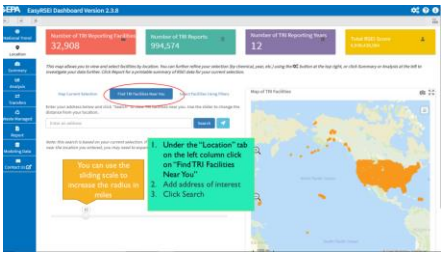


Figure C-3

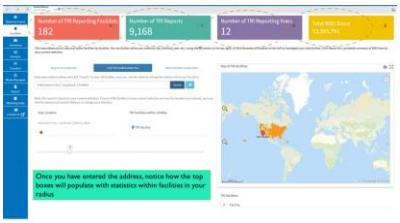


Figure C-4

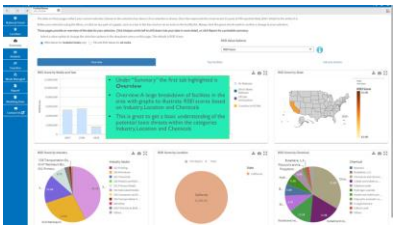


Figure C-5

Figure C-6

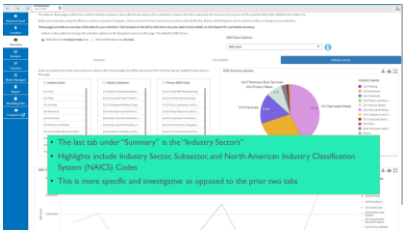
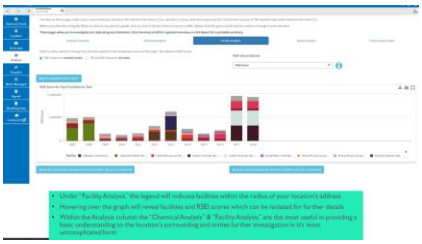


Figure C-7

Figure C-8



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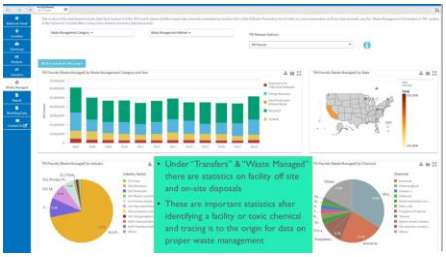


Appendix D : Toxic Release Inventory (TRI) Figures 1-7

Figure D-1

Figure D-2

Figure D-3

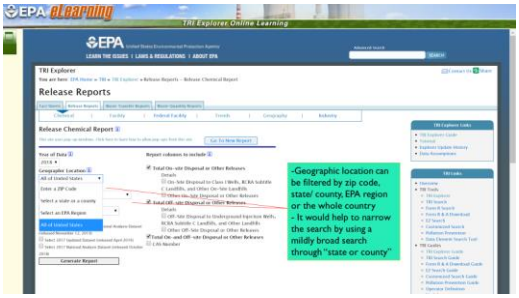
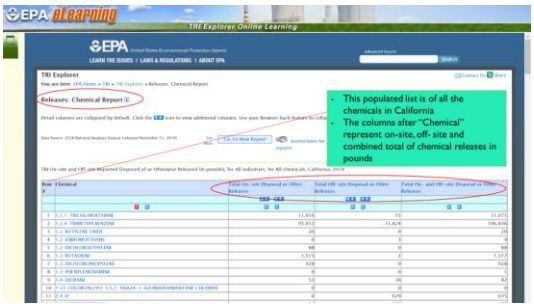


Figure D-4

Figure D-5



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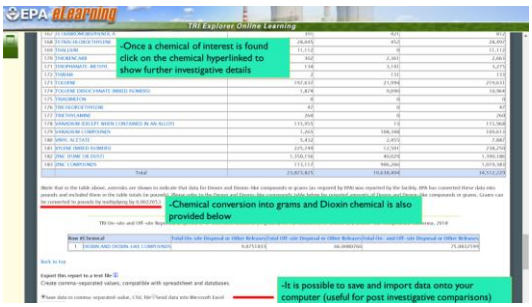

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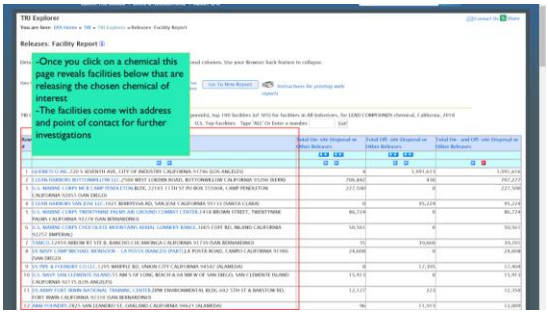


Appendix E : EJScreen Figures 1-7

Figure E-1:

Figure E-2:

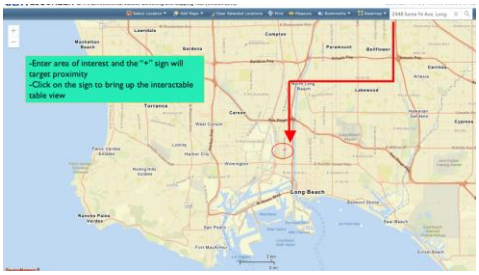


Figure E-3:

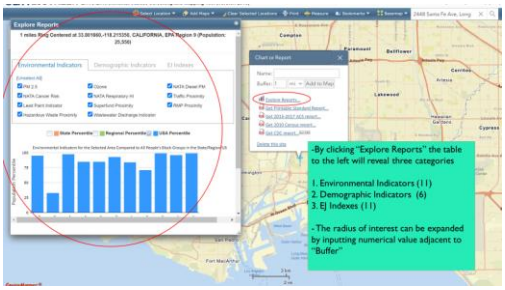


Figure E-4:

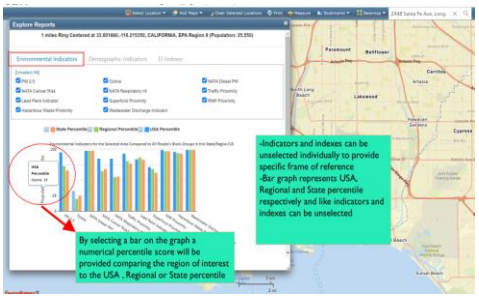


Figure E-5:

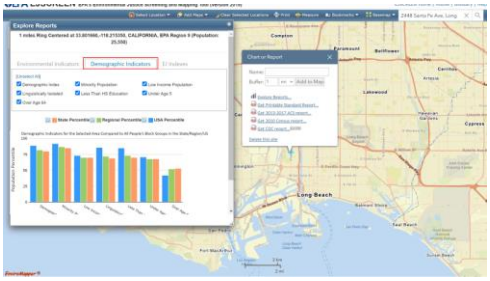


Figure E-6:

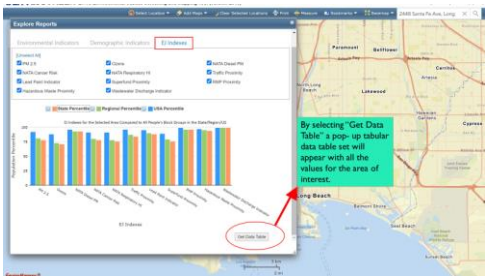
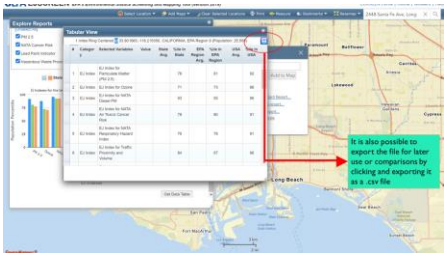


Figure E-7:



Appendix F: RSEI Resource Figures 1-3

Figure F-1: RSEI 1

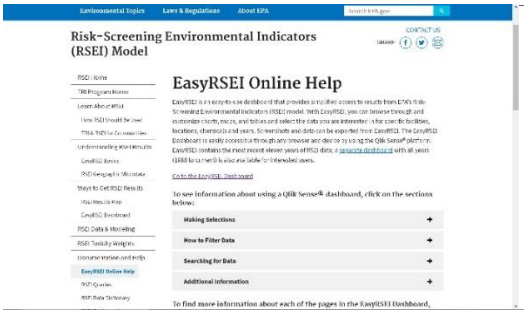


Figure F-2: RSEI 2

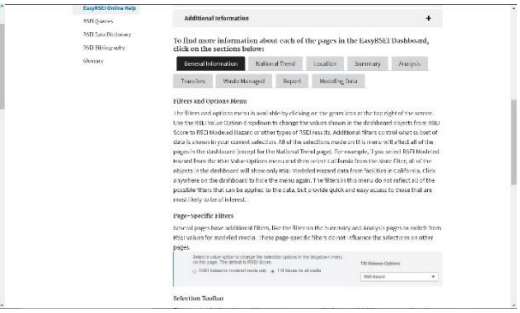
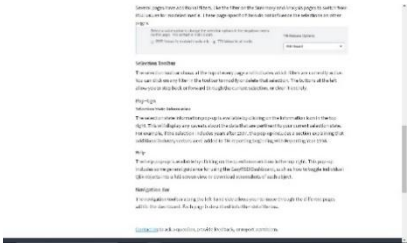


Figure F3: RSEI 3



Appendix G: Usability Table

Table 1: **Tool | Overview | Accessibility**

Tool	**Overview**	**User-Friendly Layout (Yes, No)**	**Data Literacy (Low, High)**	**Navigation Support (Low, Medium, High)**
CalEnviroScreen	Mapping tool that helps identify California communities affected by sources of pollution and factors in population burdens that are demographically based off census tract	Yes	Low	High
Risk Screening Environmental Indicators (RSEI)	RSEI uses data from TRI which follows toxic chemical releases with the potential to affect human health and the environment.	No	High	Low
Toxic Release Indicators (TRI)	TRI is a culmination of chemical release data provided by private and federal facilities	No	High	Medium
EJScreen		Yes	Low	High

Appendix H: MPH Capstone Competency Matrix

Competency (identify if foundational [FC] or concentration [CC]) Include number associated with competency	Description of how competency was synthesized
FC #19: *Communicate audience-appropriate public health content, both in writing and through oral presentation*. (Describe only how your paper and presentation were 'audience appropriate')	This competency was synthesized via presentation simulated recordings 7/22 and on 8/5 during Health Professional Day Presentation.
FC #4: **Interpret results of data analysis for public health research, policy and practice**	The competency was synthesized via capstone qualitative and quantitative analysis and interpretation of results through comparative analysis.
FC#5 : Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings	The competency was synthesized via working with CEH partner leaders to create specific presentation tutorial that is demonstrated through capstone and deliverable
FC#6: . Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels	The competency was synthesized via capstone in addressing the need for community engagement to combat environmental injustices and to hold facilities accountable.
FC#8: Apply awareness of cultural values and practices to the design or implementation of public health policies or programs	The competency was synthesized via catering tutorial presentation for CEH partner East Yard Center for Environmental Justice to facilitate stronger correlated learning outcomes
#18 Select communication strategies for different audiences and sectors	The competency was synthesized via analysis of geospatial screening tools and synthesizing presentation to reflect laymen vernacular and explanations for novice comprehension
#5- Community and Public Health Practice Comp Identify environmental health risks in vulnerable communities and examine strategies to reduce exposures	The competency was synthesized via tutorial presentation that identifies geospatial tools accessibility for investigative environmental justice.
#4: Apply project management strategies to improve the quality of programs and services in public health settings	The competency was synthesized via development of tutorial of all four EPA geospatial tool and combining an analysis of the tools for novice users creating greater accessibility and awareness toward the quality of EPA screening tools.

References

Anderton, D. L. , A. B. Anderson , J. M. Oakes , and M. R. Fraser . 1994. Environmental equity: The demographics of dumping. Demography 31 (2): 229-248.

Berendt, B., Eisend, M., & Kralisch, A. (2005). The Impact of Culture on Website Navigation Behaviour.

Bhargava, R., Deahl, E., Letouze, E., Noonan, A., Sangokoya, D., & Shoup, N. (2015). Beyond Data Literacy: Reinventing Community Engagement and Empowerment in the Age of Data. *Data-Pop Alliance White Paper Series.*

Burke, L. M. 1993. Race and environmental equity: A geographic analysis in Los Angeles. Geo-Info Systems, October, 44-50.

California Office of Environmental Health Hazard Assessment (2018, June 25). *CalEnviroScreen3.0.* https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30

Chiu, J., Garett, R., Young, S., & Zhang, L. (2016). A Literature Review: Website Design and User Engagement. *Online J Commun Media Technol. 6(3):* 1-14.

Cyril, S., Possamai- Inesedy, A., Renzaho, A. M. N., & Smith, B.J. 2015. Exploring the role of community engagement in improving the health of disadvantaged populations: a systematic review. *Glob Health Action*. DOI: https://dx.doi.org/10.3402%2Fgha.v8.29842

Morello-Frosch, R., Pastor, M., & Sadd, J. (2001). Environmental Justice and ASouther California's "Riskscape" The Distribution of Air Toxics Exposures and Health Risks Among Diverse

Communities. *Urban Affairs Review, 36(4):* 551-578. DOI: https://doi.org/10.1177/10780870122184993

United States Environmental Protection Agency (2017, January 19). *EJSCREEN:Environmental Justice Screening and Mapping Tool.* https://www.epa.gov/ejscreen/what-ejscreen

United States Environmental Protection Agency. (2020, February 11). *EasyRSEI Dashboard Version 2.3.8.* https://edap.epa.gov/public/extensions/EasyRSEI/EasyRSEI.html

United Stated Environmental Protection Agency. (2020, March 5). *TRI Explorer.* https://enviro.epa.gov/triexplorer/tri_release.chemical