To Help the Most Vulnerable:

Using GIS for Emergency Planning in the Lower Green River Valley, WA

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Lessons of Hurricane Katrina

The White House, *The federal response to Hurricane Katrina: Lessons learned*

- An estimated 1,330 people were dead as a result of the storm
- Many of the dead were elderly or infirm

  In Louisiana, 71% of the victims were older than 60 years, and 47 % of those were over 75 years old
- At least 68 victims were found in nursing homes, some of whom were allegedly *abandoned by their caretakers*
- As of February 17, 2006, there were still 2,096 people from the Gulf Coast area reported missing

Who is vulnerable?

Individuals in need of additional response assistance may include those who have ***disabilities***; who live in ***institutionalized settings***; who are ***elderly***; who are ***children***; who are from ***diverse cultures***; who have ***limited English proficiency*** or are non-English speaking; or who are ***transportation disadvantaged*** (FEMA, 2008)

Disaster Response in Washington

- Since 2000, FEMA has made 40 emergency or major disaster declarations for Washington, including earthquakes in 2001 and 2003;
- Every county in the state has been affected at least once between 2000 and 2009.

FEMA Major Disaster Declarations for Washington since 2000

Recno	Year	Date	Disaster Types
1	2009	2-Mar	Severe Winter Storm and Record and Near Record Snow
2	2009	30-Jan	Severe Winter Storm, Landslides, Mudslides, and Flooding
3	2007	8-Dec	Severe Storms, Flooding, Landslides, and Mudslides
4	2007	14-Feb	Severe Winter Storm, Landslides, and Mudslides
5	2006	12-Dec	Severe Storms, Flooding, Landslides, and Mudslides
6	2006	17-May	Severe Storms, Flooding, Tidal Surge, Landslides, and Mudslides
7	2003	7-Nov	Severe Storms and Flooding
8	2001	1-Mar	Earthquake

Department of Social and Health Services

Serves state's most vulnerable residents

- Persons with physical and developmental disabilities (344,000 clients)
- Seniors (94,100 clients)
- Foster children (11,000 clients)
- Persons with limited English proficiency (at least 130,600 clients)
- Most clients are low-income

Lead state agency for planning related to special needs populations

- **Governor's Directive** to DSHS:

  "Assist affected jurisdictions as they identify special needs populations in the potentially affected areas and plan for the care of special needs populations."

- DSHS has been working with other state and local agencies to enhance emergency preparedness with regard to special needs populations in the Green River Valley in South King County.

Persons with Disabilities in Washington

DSHS Clients vs. Low-Income General Population

Age	DSHS Clients (*)			State Low Income Population			*DSHS to State,*
	With a disability	All clients	Percent	**With a disability (**)**	All persons	Percent	***with disabilities, percent***
0-17	62,657	697,541	9.0	55,538	656,929	8.5	*112.8*
18-64	229,651	770,018	29.8	285,170	1,246,716	22.9	*80.5*
65+	47,719	94,101	50.7	137,242	264,139	52.0	*34.8*
No data	862	10,803	8.0				
TOTAL	**340,889**	**1,572,463**	**21.7**	**477,950**	**2,167,784**	**23.4**	***71.3***

(*) DSHS clients exclude those receiving Child Support Enforcement services only.

(**) Estimated for all persons ages 0 to 17 from persons ages 0 to 17 with *a known disability status*.

Notes:

1. DSHS clients with a disability: All clients meeting one or more of the following conditions:
 a) At least one month of medical coverage in FY 2006 in any of the following coverage categories: Medicaid Disabled; Healthcare for workers with disabilities; GA-U; ADATSA.

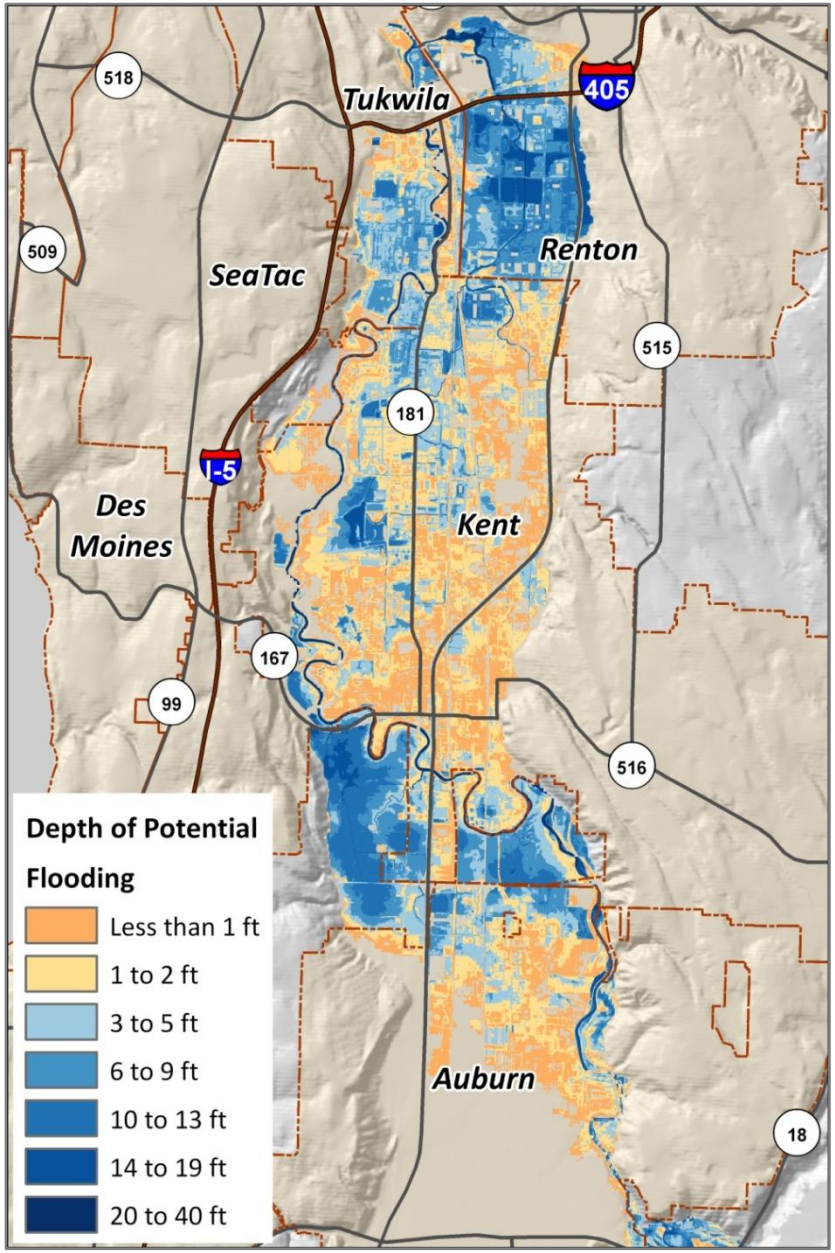
 b) Received any of the following services in FY 2006: any Aging and Adult Service in-home, community residential, or nursing home; any DD; any DVR; any MHD.

2. Low income: persons with income at or below 250% of federal poverty level.

Data Sources:

1) DSHS clients: Client Outcomes Data Base (CODB), SFY2006

2) Persons in poverty: 2005-2007 American Community Survey, 3-year average data



The Lower Green River Valley Project

Conceptually, very straightforward

1. Obtain addresses of DSHS clients with special needs, service providers, facilities, and staff
2. Geocode these addresses
3. Overlay/spatially join to the area potentially affected by flood
4. Prepare maps and tables; distribute the information to emergency planners

Step 1: Obtain addresses

Challenges

1. DSHS is comprised of *multiple* programs
2. Each program began the Green River planning at a *different* time and with existing staff
3. Separate data streams, different formats, content, repeated requests

Facilities

- DSHS Owned Facilities
- DSHS Leased Facilities
- Nursing Homes, Boarding Homes, Adult Family Homes, Foster Homes
- Medical Service Providers
- DEL Licensed Childcare Centers

Clients

- Office of Deaf and Hard of Hearing, Developmental Disabilities Division, Division of Vocational Rehabilitation, other
- Transportation Clients
- High Medical Risk Clients on/with dialysis, ventilator, tracheotomy, oxygen, home Infusion, hemophilia, insulin

Staff

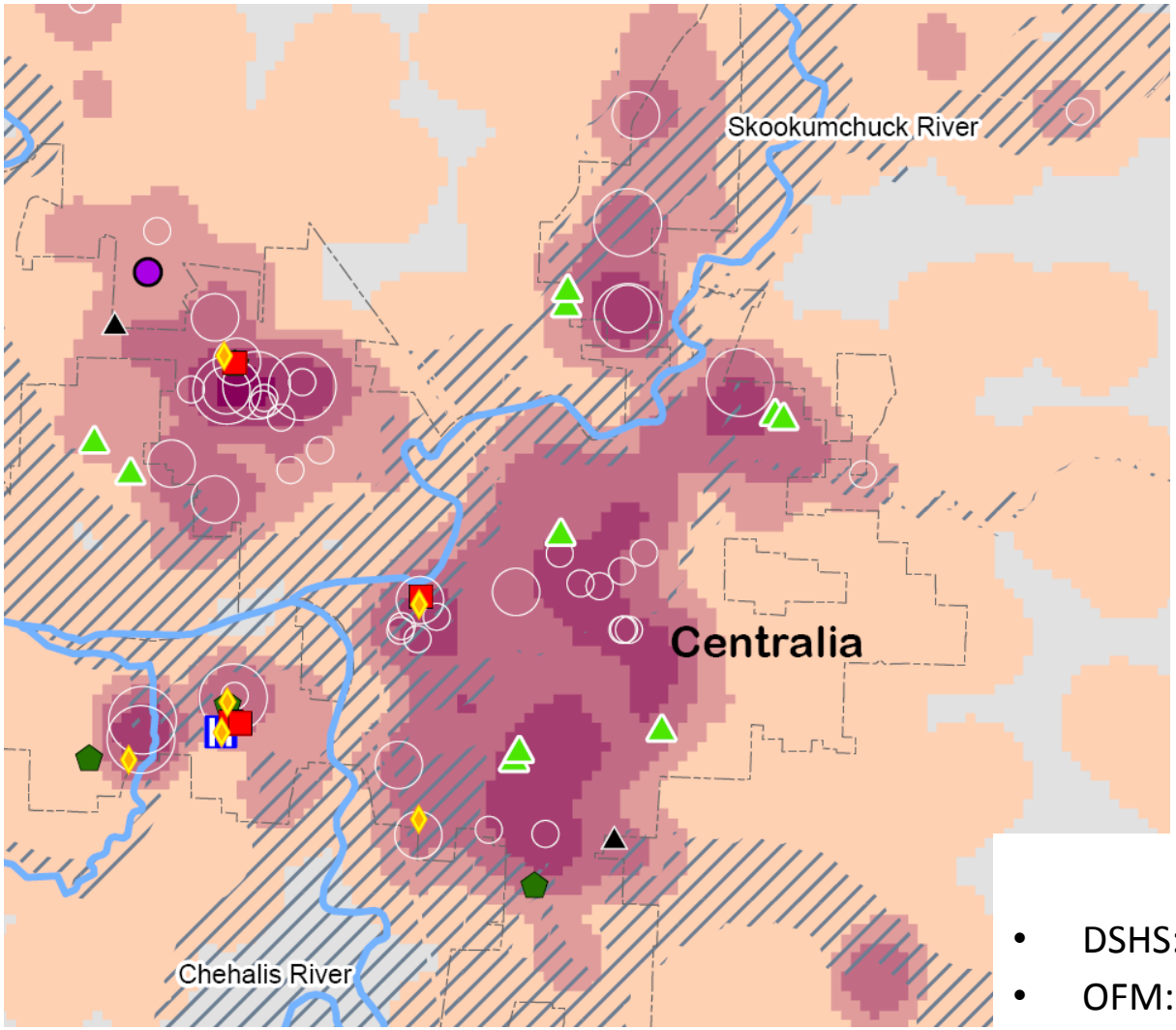
- Children's Administration, Economic Services Administration

Step 2: Geocode addresses

Challenges

1. What data, provider, and program/process to use?
   - Centrus / geocoding to streets
   - WA Parcel Workgroup data / geocoding to tax parcels (currently, 33 counties)
   - Other?
2. How good are the addresses?
   - How current: some clients move a lot more often than others
   - Some are service provider addresses, not home addresses
   - PO Boxes; homeless clients
3. How do you treat non-matches?
   - Automated assignment
   - Manual assignment
   - What's the cost of poor matching?

Accuracy of Geocoding: an Example



- DSHS Facility Leases
- Adult Family Home
- Boarding Home
- Group Care Home
- Hospital
- Nursing Home
- OFM GQs 50+ persons
- Cities
- Major Rivers
- Special Flood Hazards Area

DSHS clients in a single location
- 20 - 50
- 51 - 100
- 101 - 220

Persons per acre (DSHS clients)
- 0 - 0.5
- 0.6 - 2
- 2.1 - 5
- 5.1 - 10.1
- 10.2 - 12.3

Data sources

- DSHS: facility leases, clients
- OFM: group quarters with 50+ persons
- DOH: adult family homes and other group homes, hospitals

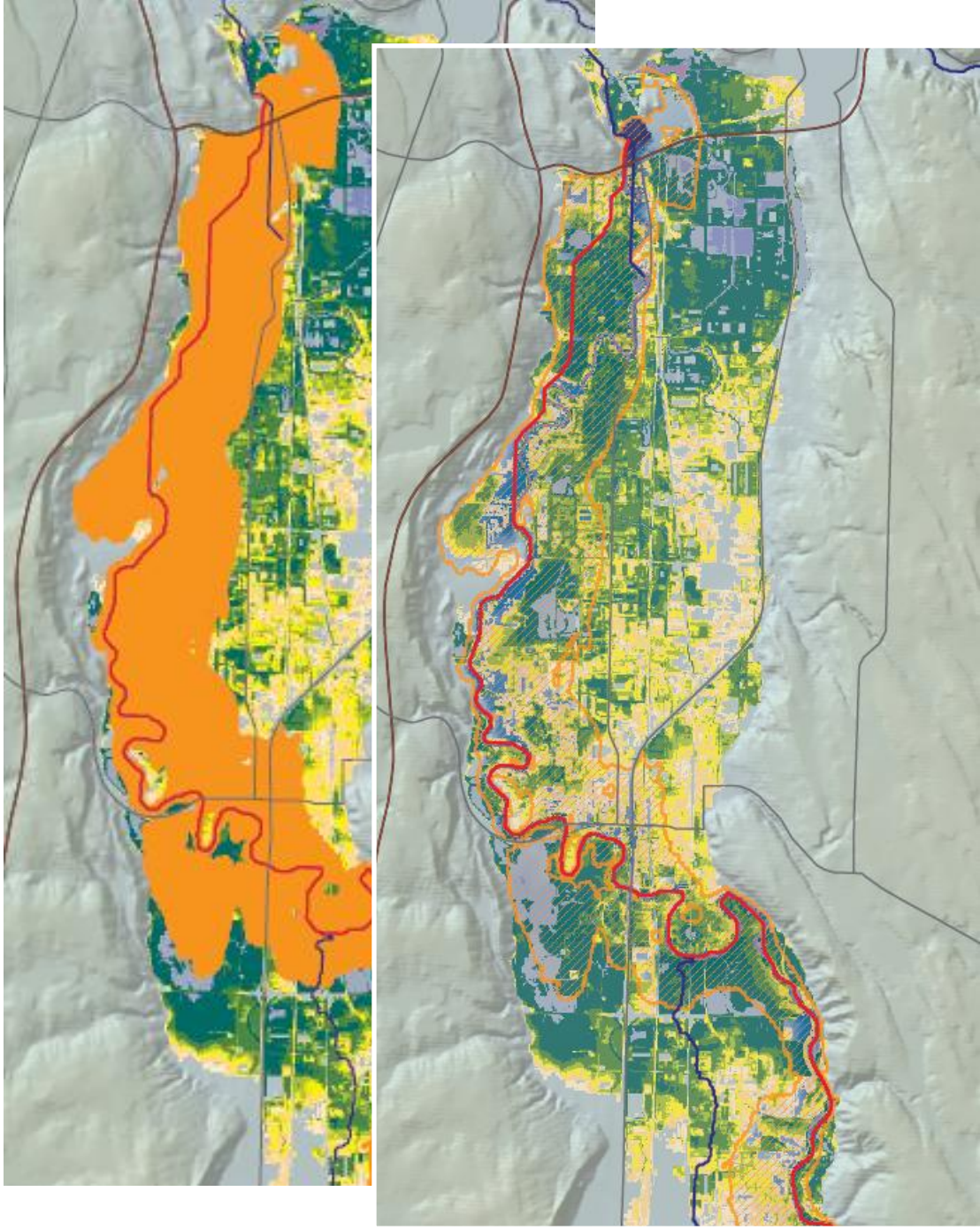
Step 3: Overlay with hazards data

Challenges

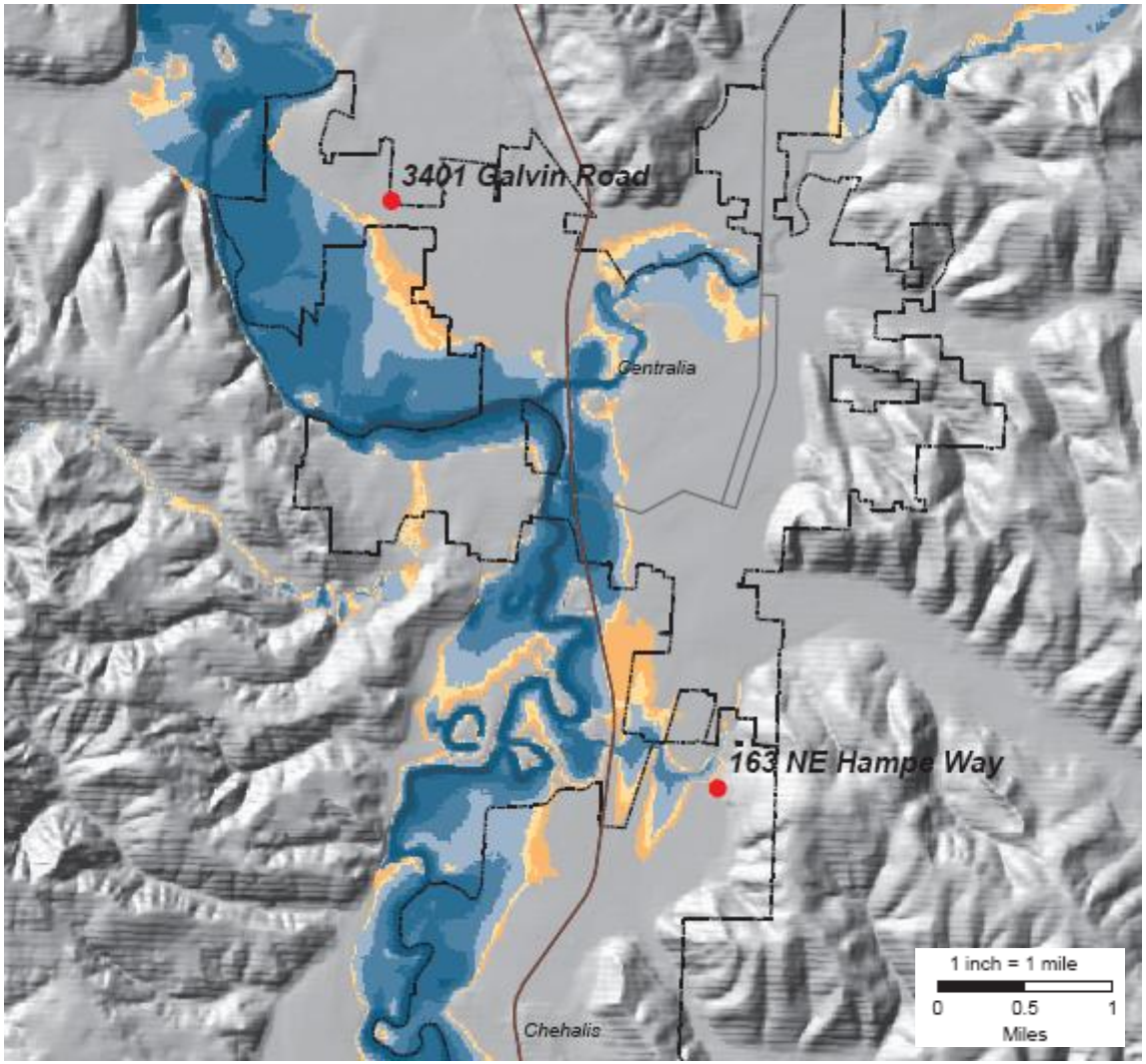
What data, provider and process to use?

- FEMA 100-year flood plain
- USACE
- Other?

How do we know where the risk is?

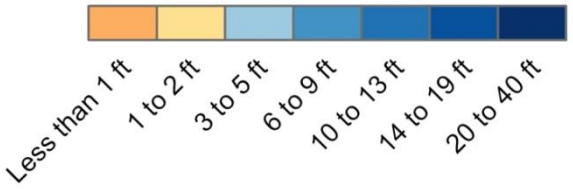


Data Sources Outside the Green River Valley?



- FEMA HAZUS was used to assess the location of two DSHS facilities relatively to the Chehalis River floodplain

Depth of Potential Flooding



Step 4: Distribute Maps & Other Information

Challenges

1. Health Insurance Portability and Accountability Act of 1996 (HIPAA)
   - Standards for Privacy of Individually Identifiable Health Information ("Privacy Rule")
   - "Individually identifiable health information" is information, including demographic data, that relates to:
     - the individual's past, present or future physical or mental health or condition,
     - the provision of health care to the individual, or
     - the past, present, or future payment for the provision of health care to the individual,
     - and that identifies the individual or for which there is a reasonable basis to believe it can be used to identify the individual. Individually identifiable health information includes many common identifiers (e.g., name, address, birth date, Social Security Number).
2. WA state statutes

Addressing HIPAA in Emergency Planning

Short-term (Green River Valley)

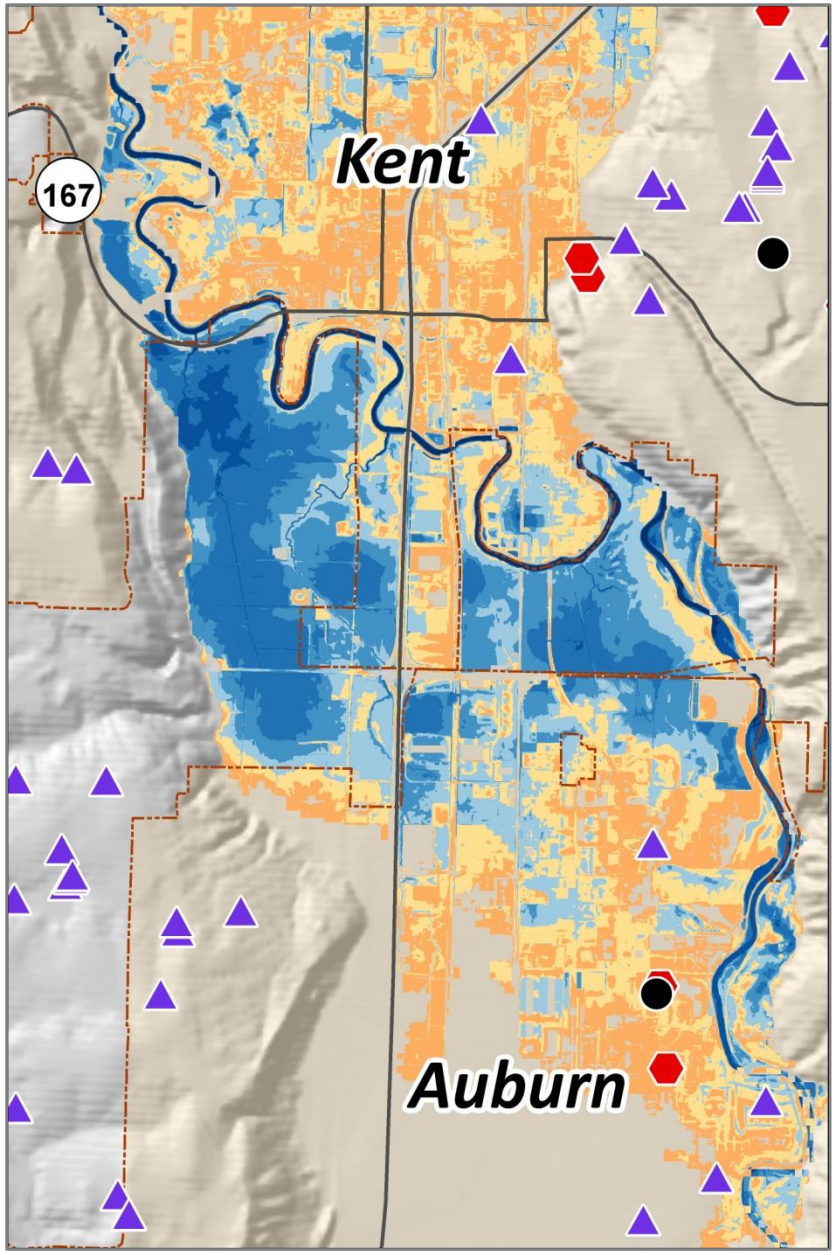
1. Limited distribution channels within the agency, a designated contact person
2. Generalized maps
3. Adding a footnote about confidential nature of the maps
4. Summary tables

Long-term

1. Data-sharing agreements with designated "public health authorities"
2. Obtaining individual authorizations
3. Creating a voluntary registry

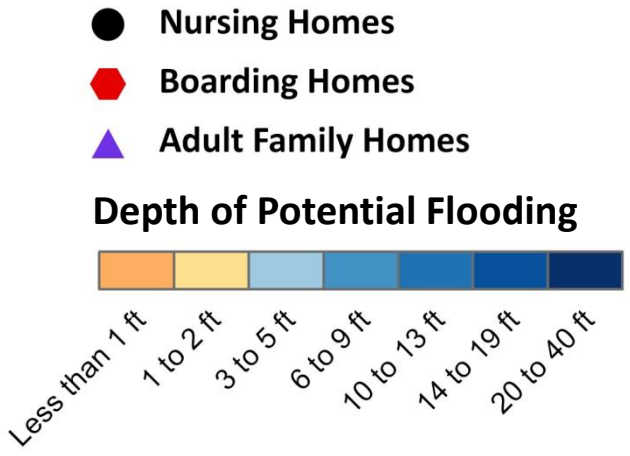
- *These solutions require massive investments of time and resources*

DSHS Long-term Care Facilities

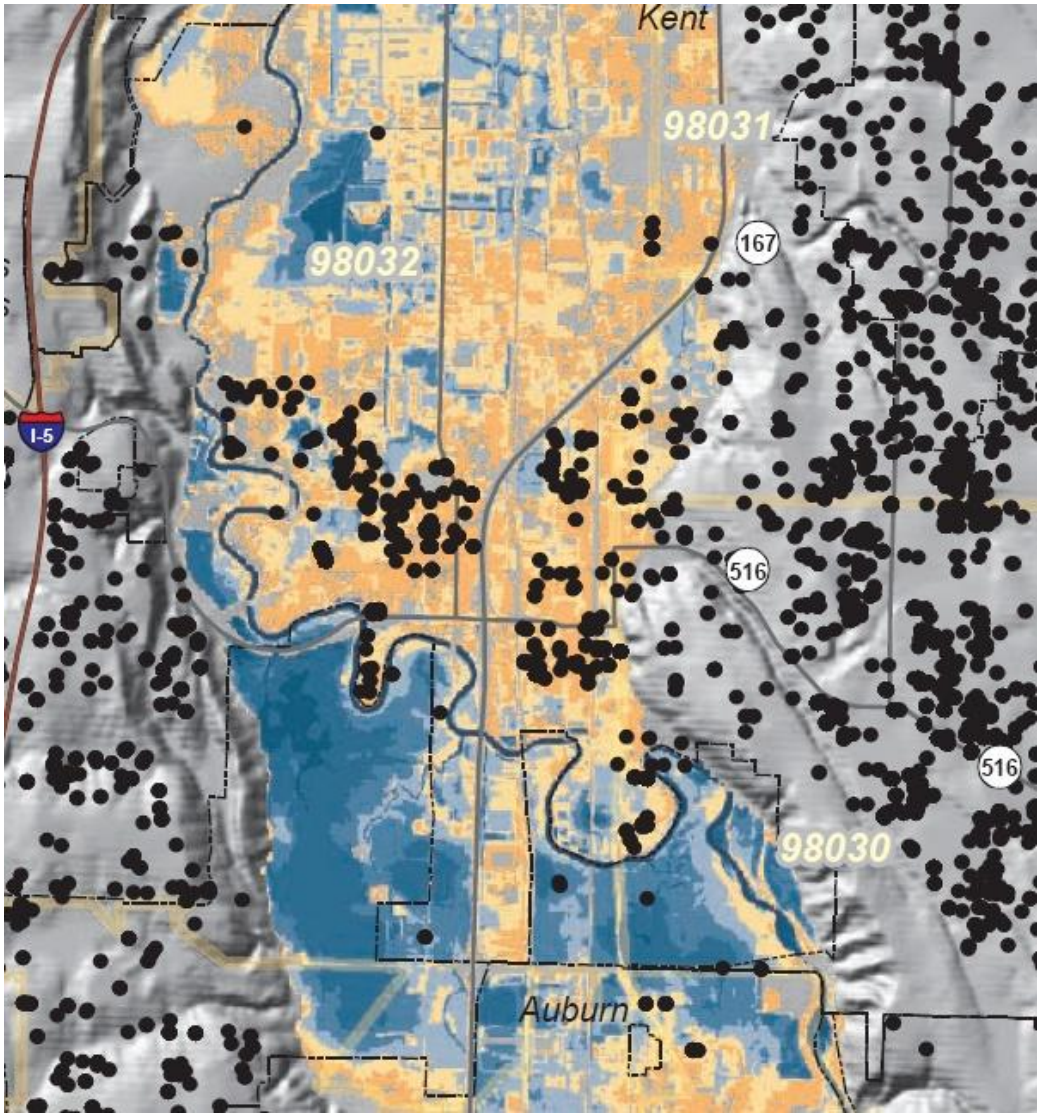


- In inundation area: 345 beds in 8 long-term care facilities (1 nursing home, 2 boarding homes and 5 adult family homes).
- In nearby area: 2,137 beds in 200 long-term care facilities.

Long-Term Care Facilities in Green River Valley



DSHS Clients with Limited English Proficiency



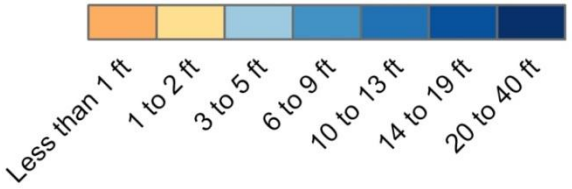
In the inundation area

- 1,950 people
- 36+ languages

Top 10 languages:

SPANISH	1,345
RUSSIAN	209
SOMALI	107
VIETNAMESE	48
UKRAINIAN	23
CHINESE	20
CAMBODIAN (KHMER)	16
SAMOAN	16
ARABIC	15
TAGALOG	14

Depth of Potential Flooding



Estimated Special Needs Population Served by DSHS in Green River Valley

	Inundation Area		Nearby Area		Total	
Type of Special Needs	# of Long-Term Care Facilities	Special Needs Population	# of Long-Term Care Facilities	Special Needs Population	# of Long-Term Care Facilities	Special Needs Population
Nursing Homes	1	125	5	430	6	555
Boarding Homes	2	196	17	726	19	922
Adult Family Homes	5	24	178	981	183	1,005
Total Long-Term Care	**8**	**345**	**200**	**2,137**	**208**	**2,482**
Foster Care Homes	1	2	67	127	68	129
Medical Risk Factors		222		1,364		1,586
Transportation Need: High		142		634		776
Transportation Need: Medium		1,266		6,525		7,791
Developmental Disabilities		267		1,385		1,652
Vocational Rehabilitation		41		547		588
Deaf and Hard of Hearing		40		234		274
Total Special Needs Clients		**1,980**		**10,816**		**12,796**
Long-Term Care and Special Needs Clients		**2,325 8.6%**		**12,953 5.9%**		**15,278 6.1%**
Total Population in Area		**27,105**		**221,410**		**248,515**

The Green River Project: Lessons Learned

The project was complicated

- The flow of data and information was arduous
- Data came from different sources, at different times and in different formats
- Issues of confidentiality of personal information when used for **emergency planning** are complex, unclear

We had a 3-4 months window to prepare for a potential emergency in the Green River Valley

- Most emergencies occur with little or no advance warning
- Vulnerable populations are all over the state, many in rural or otherwise hard-to-reach areas
- The state needs:
  - a central repository of timely, accurate and well-integrated data about its vulnerable populations,
  - tools to turn the data into information for decision-makers

Our Long-Term Goal

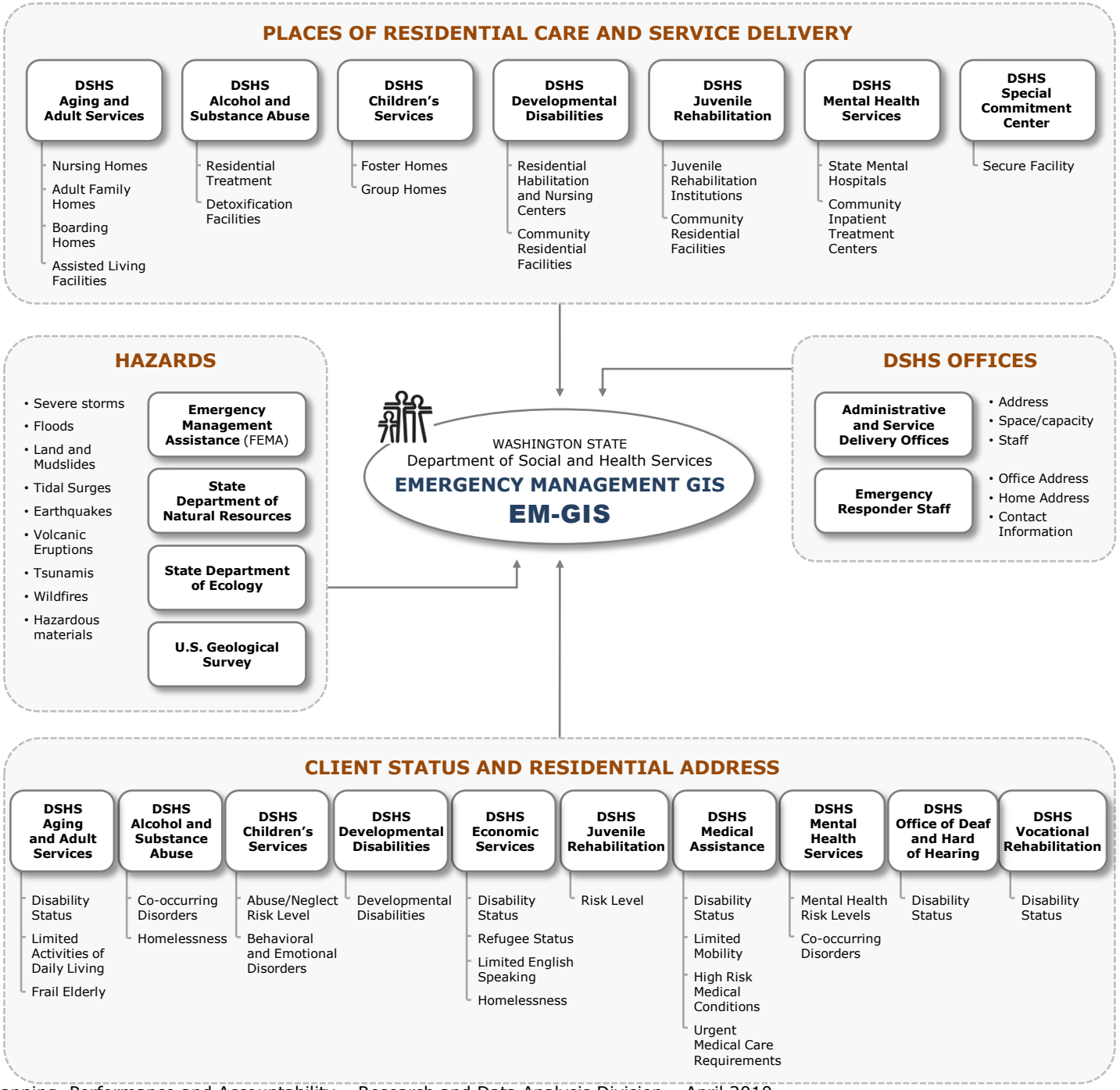
To develop a Geographic Information System (GIS) on

- location and special needs of vulnerable, high-risk people served by DSHS,
- location of DSHS offices and critical staff-service providers,
- areas prone to natural and man-made disasters,

… to be ready to provide necessary information to DSHS and EMD

- whenever a disaster happens & for planning purposes
- anywhere in the state
- close to real time
- in accordance with applicable privacy laws

First step: to develop and build **a preliminary statewide GIS** and formulate guidelines for sharing data about special needs clients with emergency planners and responders


PLACES OF RESIDENTIAL CARE AND SERVICE DELIVERY
DSHS Aging and Adult Services
Nursing Homes
Adult Family Homes
Boarding Homes
Assisted Living Facilities
DSHS Alcohol and Substance Abuse
Residential Treatment
Detoxification Facilities
DSHS Children's Services
Foster Homes
Group Homes
DSHS Developmental Disabilities
Residential Habilitation and Nursing Centers
Community Residential Facilities
DSHS Juvenile Rehabilitation
Juvenile Rehabilitation Institutions
Community Residential Facilities
DSHS Mental Health Services
State Mental Hospitals
Community Inpatient Treatment Centers
DSHS Special Commitment Center
Secure Facility
HAZARDS
Severe storms
Floods
Land and Mudslides
Tidal Surges
Earthquakes
Volcanic Eruptions
Tsunamis
Wildfires
Hazardous materials
Emergency Management Assistance (FEMA)
State Department of Natural Resources
State Department of Ecology
U.S. Geological Survey
WASHINGTON STATE
Department of Social and Health Services
EMERGENCY MANAGEMENT GIS
EM-GIS
DSHS OFFICES
Administrative and Service Delivery Offices
Address
Space/capacity
Staff
Emergency Responder Staff
Office Address
Home Address
Contact Information
CLIENT STATUS AND RESIDENTIAL ADDRESS
DSHS Aging and Adult Services
Disability Status
Limited Activities of Daily Living
Frail Elderly
DSHS Alcohol and Substance Abuse
Co-occurring Disorders
Homelessness
DSHS Children's Services
Abuse/Neglect Risk Level
Behavioral and Emotional Disorders
DSHS Developmental Disabilities
Developmental Disabilities
DSHS Economic Services
Disability Status
Refugee Status
Limited English Speaking
Homelessness
DSHS Juvenile Rehabilitation
Risk Level
DSHS Medical Assistance
Disability Status
Limited Mobility
High Risk Medical Conditions
Urgent Medical Care Requirements
DSHS Mental Health Services
Mental Health Risk Levels
Co-occurring Disorders
DSHS Office of Deaf and Hard of Hearing
Disability Status
DSHS Vocational Rehabilitation
Disability Status

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