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Greenfield Advisors, Inc.
October, 2018

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and Valuation Analysts*

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Bartow Street Capital

ACCRES, LLC

AVM Analytics – The Labs@Greenfield

The Greenfield Institute

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HIGHLIGHTS FROM VALUATION OF BROWNFIELD PROPERTIES

John A. Kilpatrick, Ph.D., MRICS
Greenfield Advisors LLC
Seattle, Washington

Author's Note: The January 2006 update to Lexis Nexis Matthew Bender's Valuation Law and Practice saw a wholesale revision of Chapter 29, "Valuation of Brownfield Properties." This article summarizes some of the highlights of that revision.

Authors John A. Kilpatrick, Ronald
I. Carruthers, and Andrew

The Aftermath of Katrina: Recommendations for Real Estate Research

John A. Kilpatrick* and Sofia Dermisi**

Abstract

This paper provides an overview of government and independent research conducted

Expert systems and mass appraisal

John Kilpatrick
Greenfield Advisors LLC, Seattle, Washington, USA

Abstract

Purpose – The purpose of this paper is to examine the usefulness of a heuristic expert system, to show its applicability to real-world valuation problems, and to suggest several avenues for statistical

ate

Rad contamination impact on property values significant

Appraisal of Contaminated Property in the United States

*Published in the October, 2003, issue of the
Journal of the Japan Real Estate Institute*

John A. Kilpatrick, Ph.D.
Mundy Associates LLC
Seattle, Washington

Bill Mundy, Ph.D., MAI, CRE
Mundy Associates LLC
Seattle, Washington

By JOHN A. KILPATRICK, Ph.D., MRICS

While determination of class certification in real es-
es, courts also

children play in dirt and place their hands and
in their mouths, increasing the opportunity for
D;

Bill Mundy, MAI, PhD

and Value

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At the heart of USPAP are a series of "Standard
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ment & Finance

l properties, trespass, and underground rents

l Kilpatrick. Will Spiess

Bill Mundy, MAI, PhD

The Impact of Hazardous and Toxic Material on Property Value: Revisited

This article is an extension of an earlier article that appeared in the April 1992 issue
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Two further methods for quantifying the impact of contamination on rent occur-

and Valuation Analysts

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Our experiences with natural and other disasters

Some common valuation themes

Action items for valuation – tools and tips

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Key Valuation Considerations

Impact on the highest and best use of properties

Market equilibrium disruptions

Model efficiency

Appraisals versus Appraisal Reports

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Key Valuation Considerations

2018 –

16 storms with > \$1 Billion damage each

\$300 Billion total storm-related damages

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Katrina – Real Estate Research

John A. Kilpatrick and Sofia Dermisi

J. Real Estate Literature, 2007

*Outlined the complexity of real estate research
following the Katrina disaster*

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Hurricane Katrina

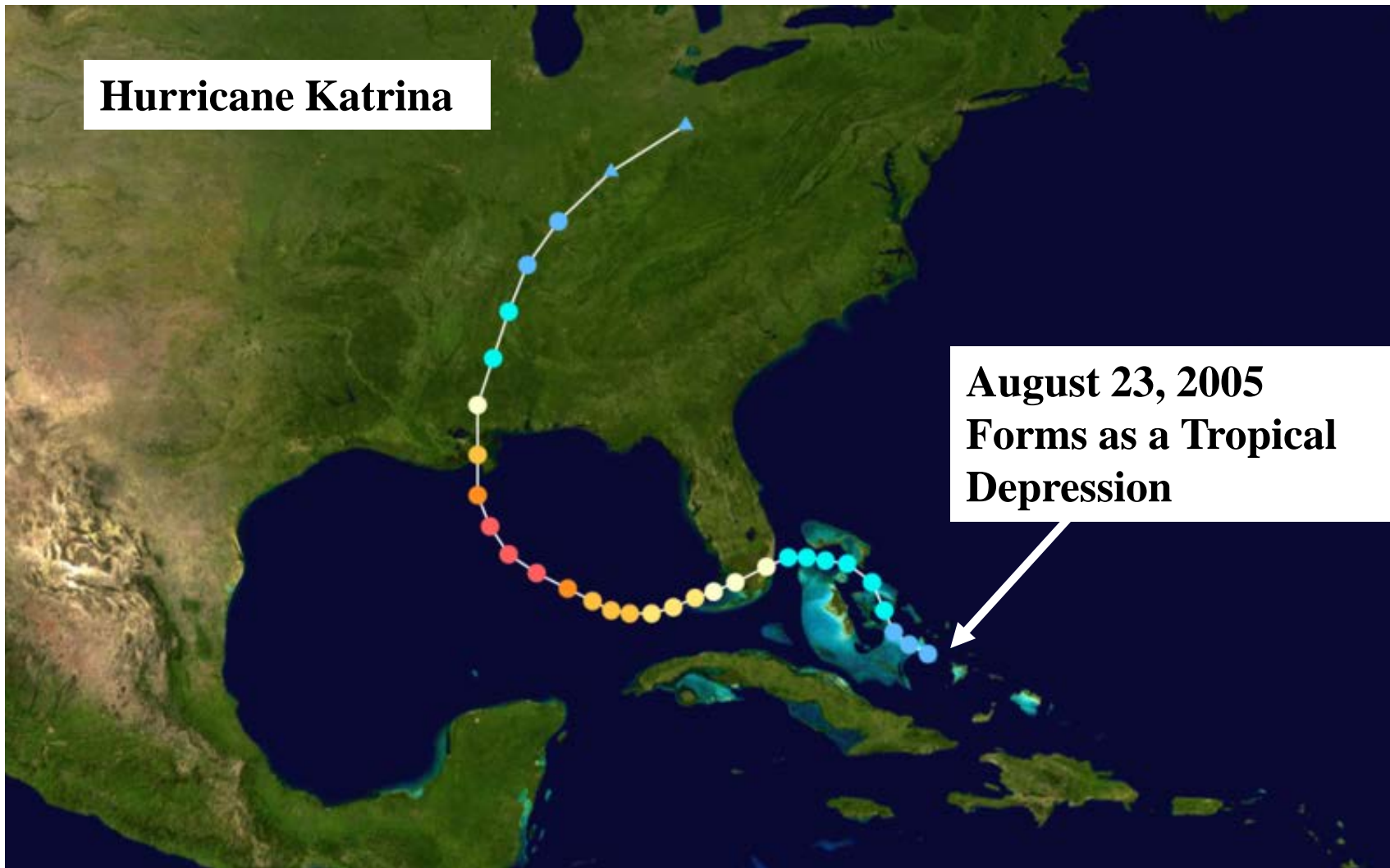


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Hurricane Katrina

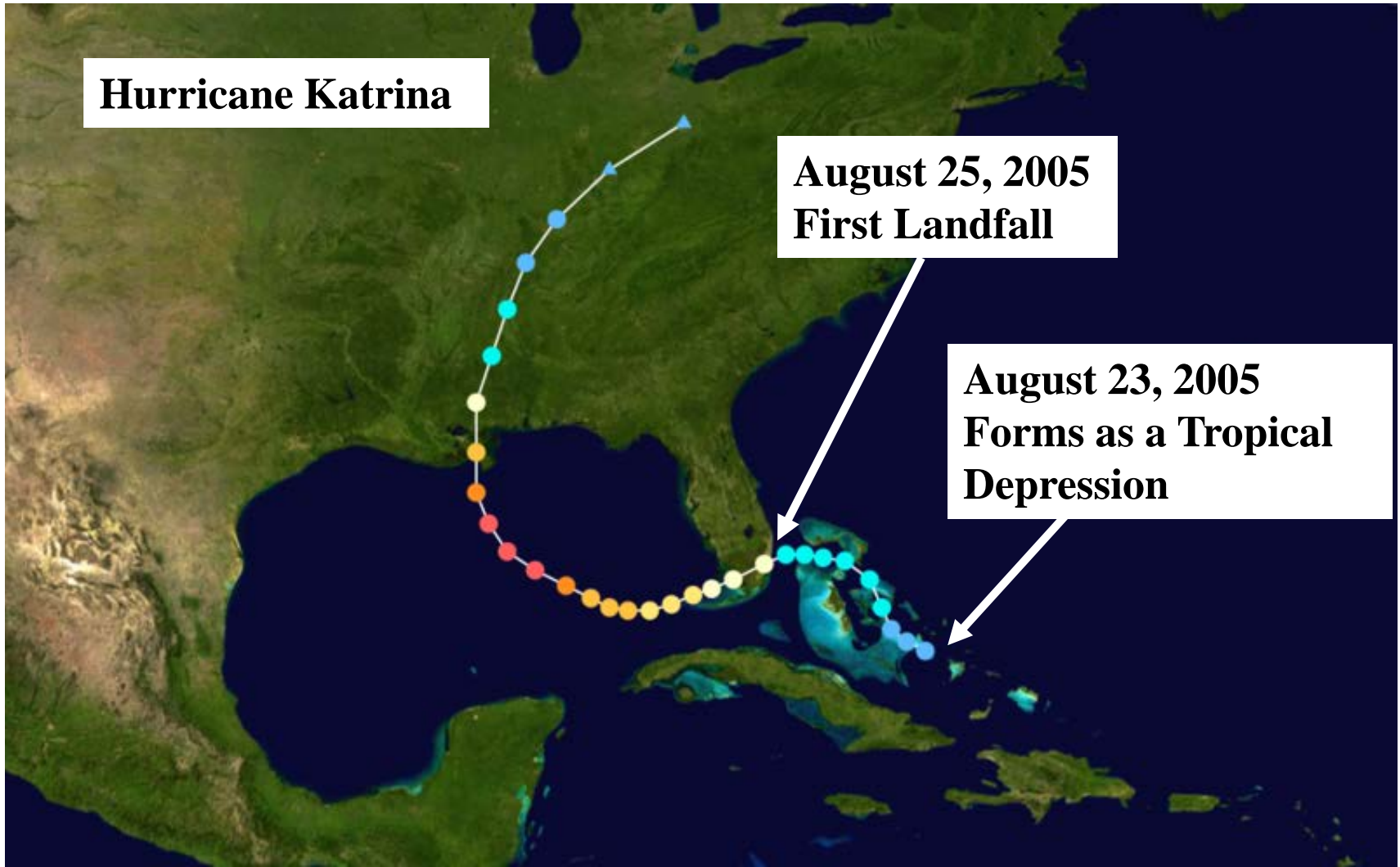
**August 23, 2005
Forms as a Tropical
Depression**



Hurricane Katrina

**August 25, 2005
First Landfall**

**August 23, 2005
Forms as a Tropical
Depression**



Hurricane Katrina

**August 25, 2005
First Landfall**

**August 23, 2005
Forms as a Tropical
Depression**

**August 29, 2005
Second Landfall**

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Hurricane Hugo

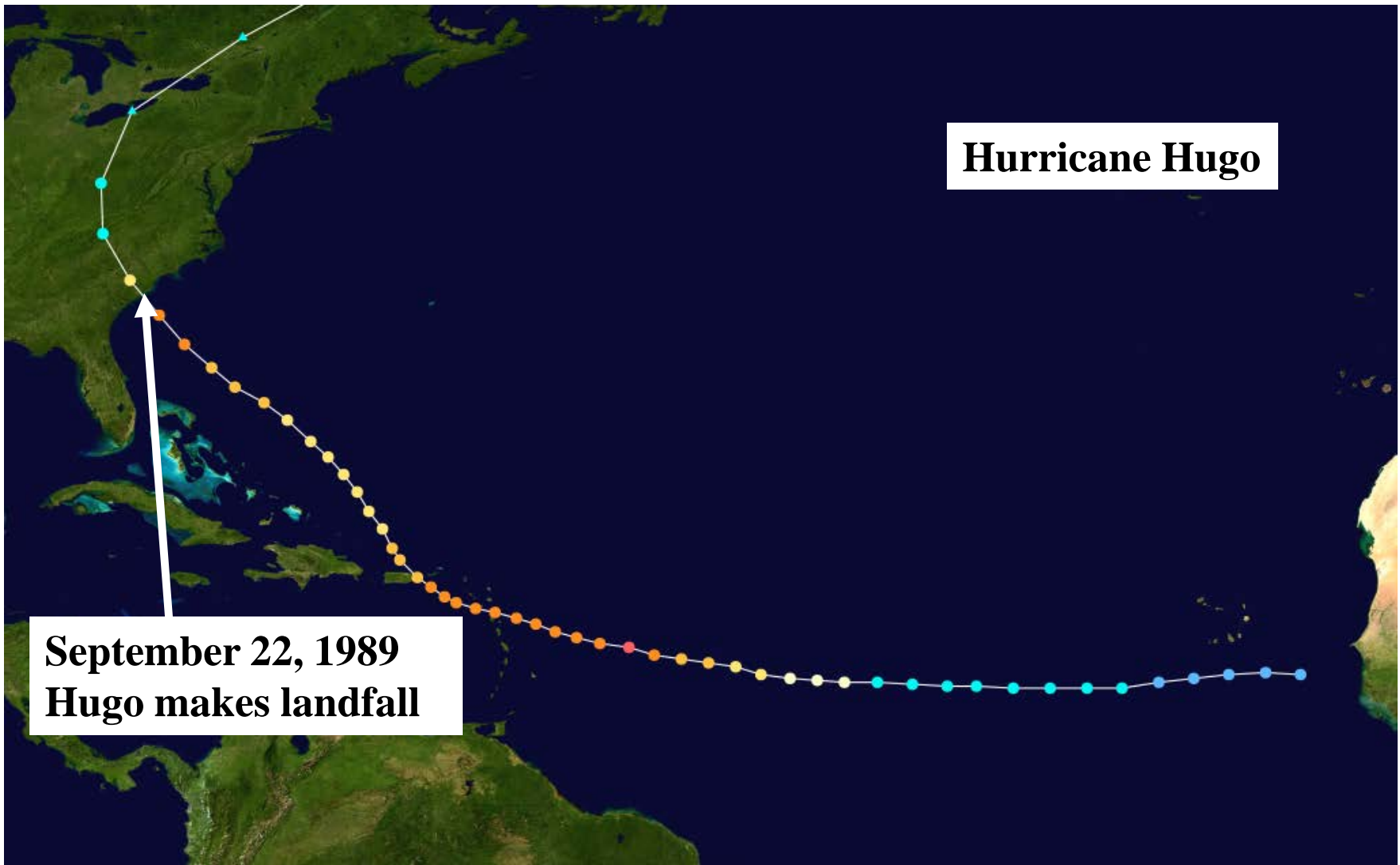


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Hurricane Hugo

September 22, 1989
Hugo makes landfall



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Hurricane Hugo

My House

September 22, 1989
Hugo makes landfall

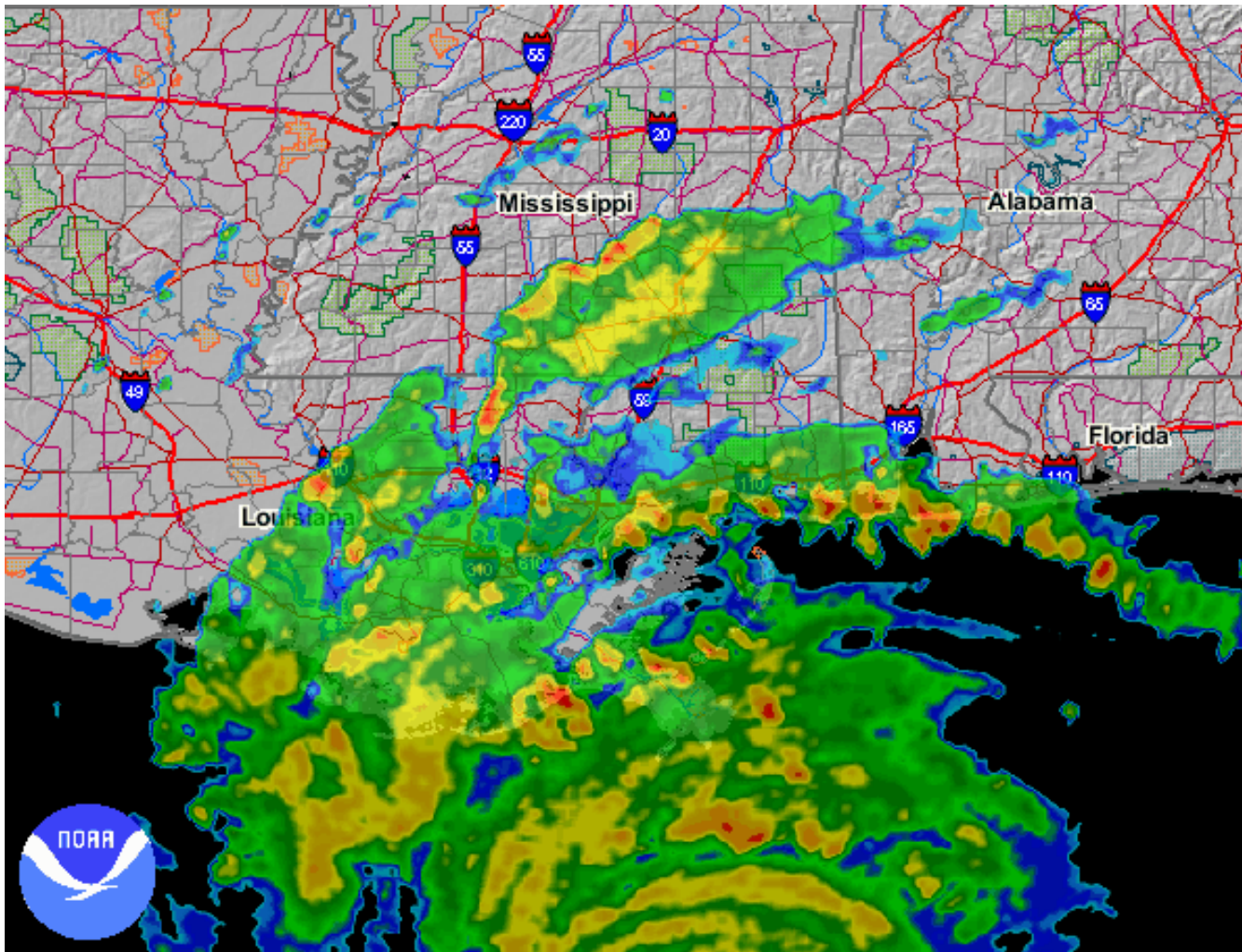




Photo courtesy NASA
August 28, 2005

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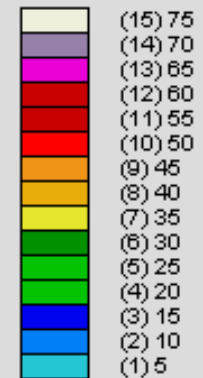
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BASE REFLECTIVITY
 KLIX - NEW ORLEANS, LA
 08/29/2005 00:02:28 GMT
 LAT: 30/20/13 N
 LON: 89/49/30 W
 ELEV: 138.0 FT
 MODE/VCP: A / 11

ELEV ANGLE: 0.50 °
 MAX: 56 dBZ
 RANGE 248 NM

Legend: (Category) dBZ



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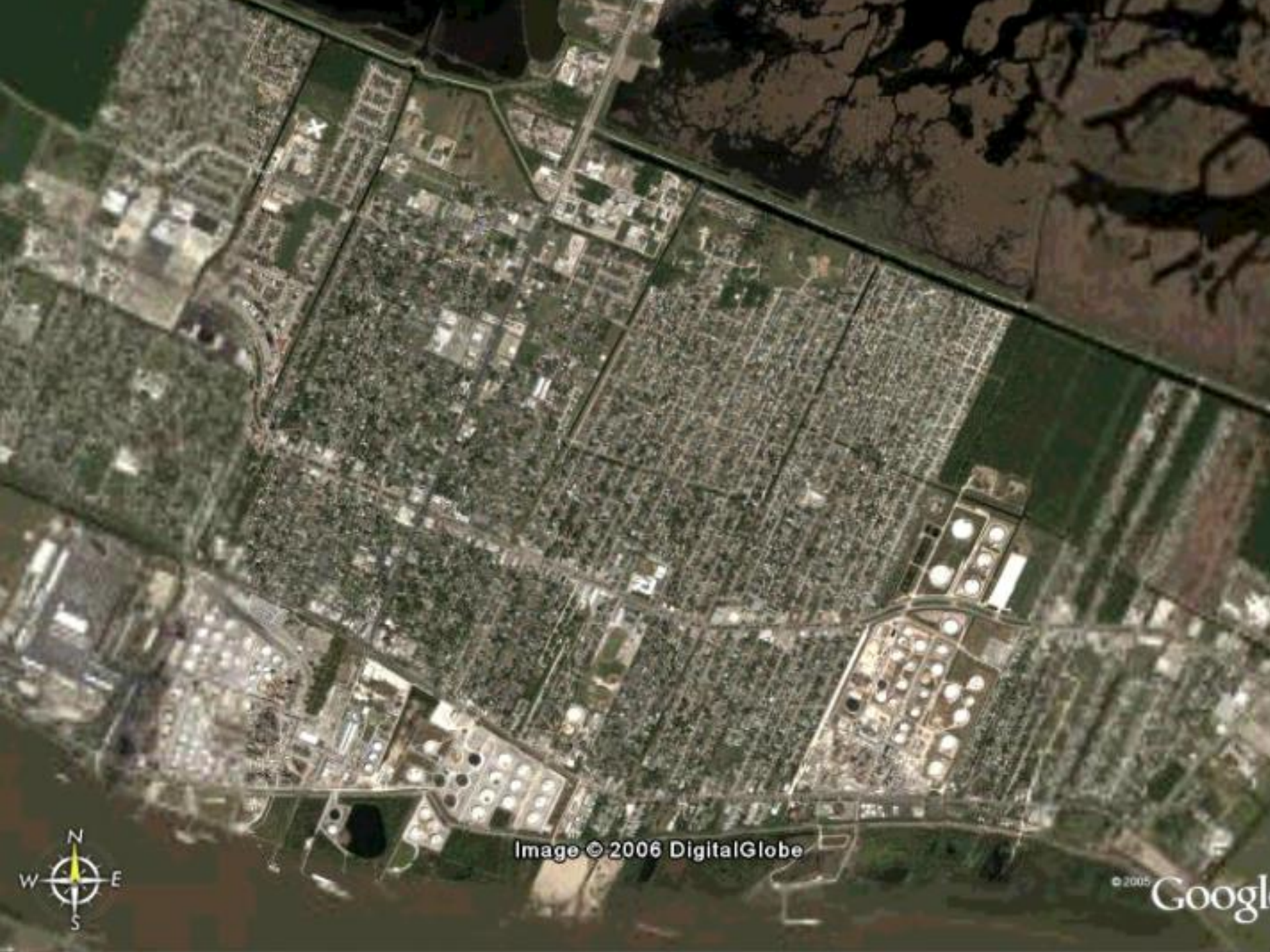


Image © 2006 DigitalGlobe



© 2005

Google

Extent of the Flooding

Photo courtesy Jim Mullins, EPA

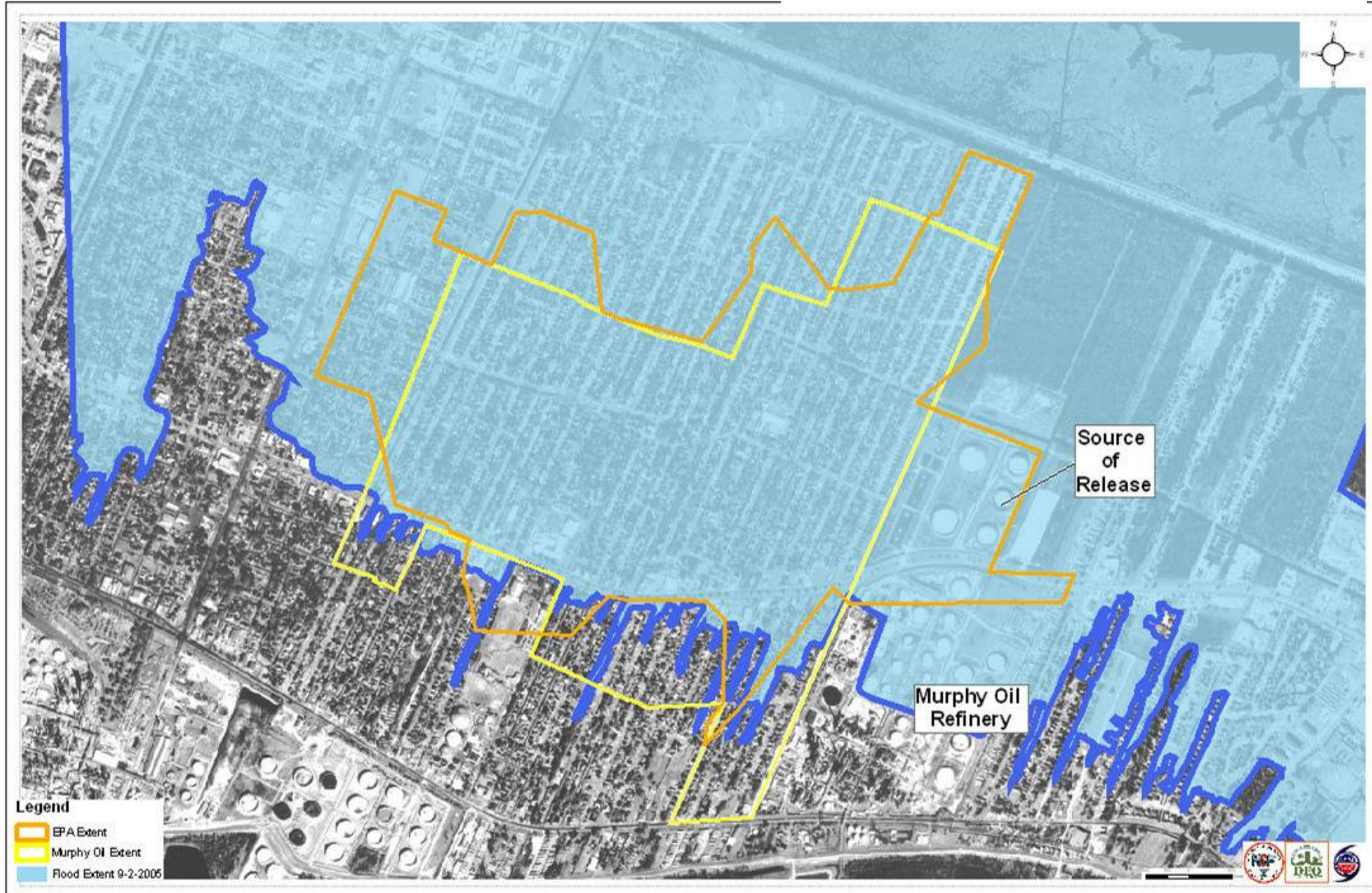










Photo courtesy ABC News

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Photo courtesy ABC News

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Murphy Oil Spill – Final Settlement

28 Plaintiff Law Firms – 6,200 Class Members

\$330,126,000 settlement

\$55 million for buyouts

\$71 million for remediation

(\$51.8 million already paid)

\$83.2 million “previous compensation”

\$100 million “additional compensation”

Prior opt-outs could “opt back in”

http://www.murphyoilcorp.com/ir/katrina/pdf%5Csummary_notice.pdf

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Katrina → Significant attention from tax assessors

Damage assessment

Heuristic models – little commonality, few standards

GIS plays a large part

AVMs and CAMA models

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Figure 2. Guideline for 2013 residential proration of value for destruction caused by flooding

GUIDELINE FOR 2013 RESIDENTIAL PRORATION OF VALUE FOR DESTRUCTION CAUSED BY FLOODING

Buildings with major physical damage caused by flooding will be prorated for 2013 starting on 9/12/2013 for the remainder of 2013 (254 days taxable at 100% "livable or useable" and 111 days at 100% "not livable or useable."). Properties to be prorated should be described as follows:

Consider property 100% uninhabitable if one or more of the following applies:

Destroyed

- Structure is leveled
- Building leaning
- Two or more exterior walls collapsed
- Second floor leaning or gone
- Flooded first floor (water/mud)
- Water above first floor door knobs
- Two or more basement walls collapsed
- Moved off foundation
- Collapsed walls and/or roof
- Exits blocked/windows broken by debris or mud flows into the dwelling
- Basically uninhabitable and/or dangerous conditions

*Adapted from Roberts, Jerry, Cynthia Braddock, and Rachel Parrinello,
“The 1,000-Year Rain: Lessons Learned in the Boulder, Colorado,
Assessor’s Office”, Fair & Equitable, June, 2014, 3-12*

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Changes in the Highest and Best Use of Property

Legal permissibility

Physical adaptability

Financial feasibility

Maximal productivity

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Changes in the Highest and Best Use of Property

Lucas v. South Carolina Coastal Council
505 U.S. 1003 (1992)

Change in legal permissibility → change in HBU

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Changes in the Highest and Best Use of Property

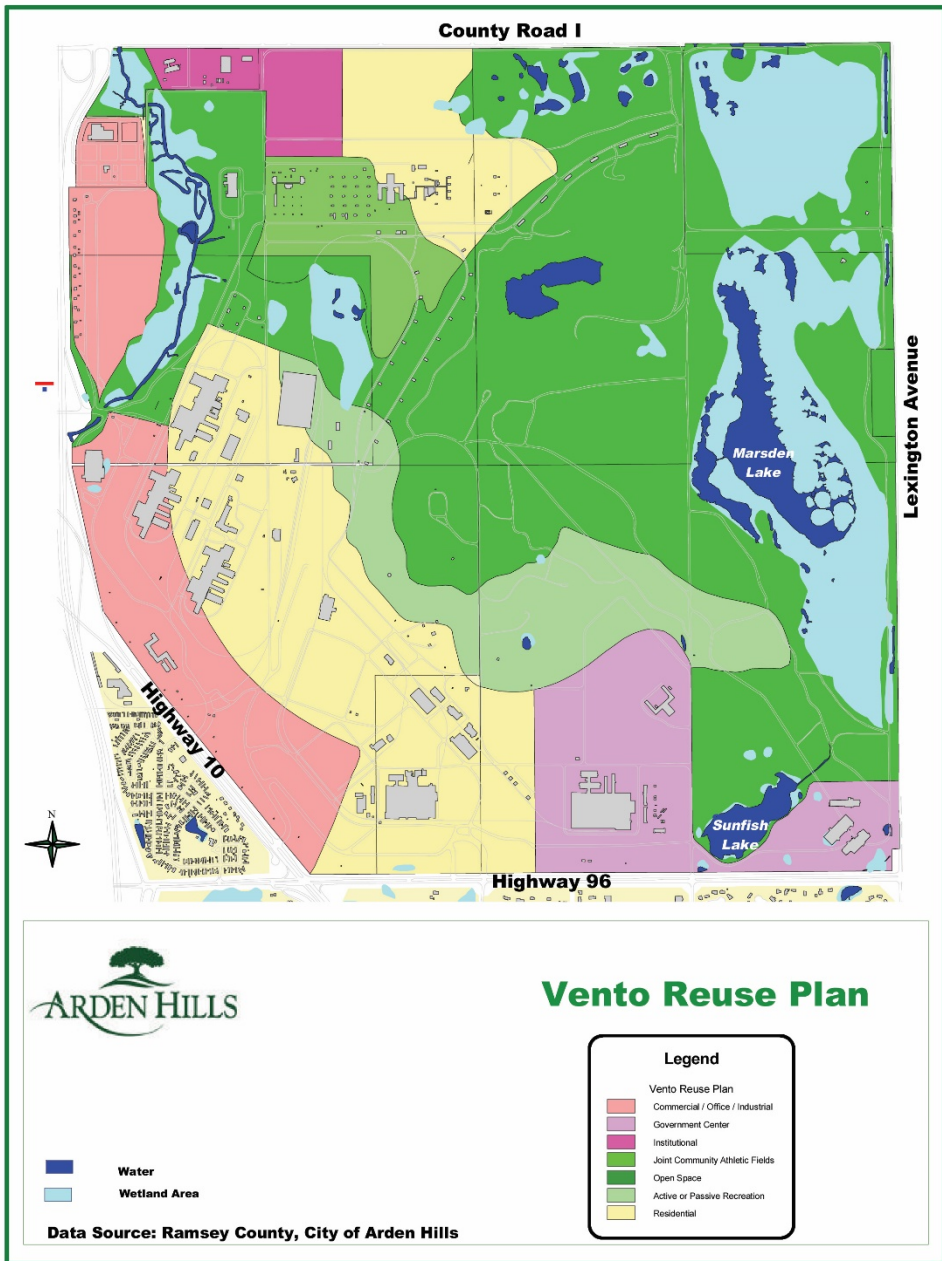
Tax Court rejected the opinion of the IRS's appraiser that the HBU of a 37.8 acre "park-like" estate after Hurricane Camile was subdivision for real estate development...

Tax Court rejected a taxpayer's claim that the highest and best use of property after Hurricane Agnes was wasteland, when evidence indicated it was still being used for water recreational purposes...

Adapted from Smith, Kames K, and Barbara Lougee, "The Appraiser's Role in Calculating Casualty Loss Deductions from Natural Disasters", The Appraisal Journal, Winter, 2014, 27-36

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Twin Cities Army Ammunition Plant

The Vento Plan



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113 ac

Ramsey
County
Request

Army Surplus

Army
Surplus

Vento
Plan
Corridor

49 ac

MN National Guard

Army
Surplus

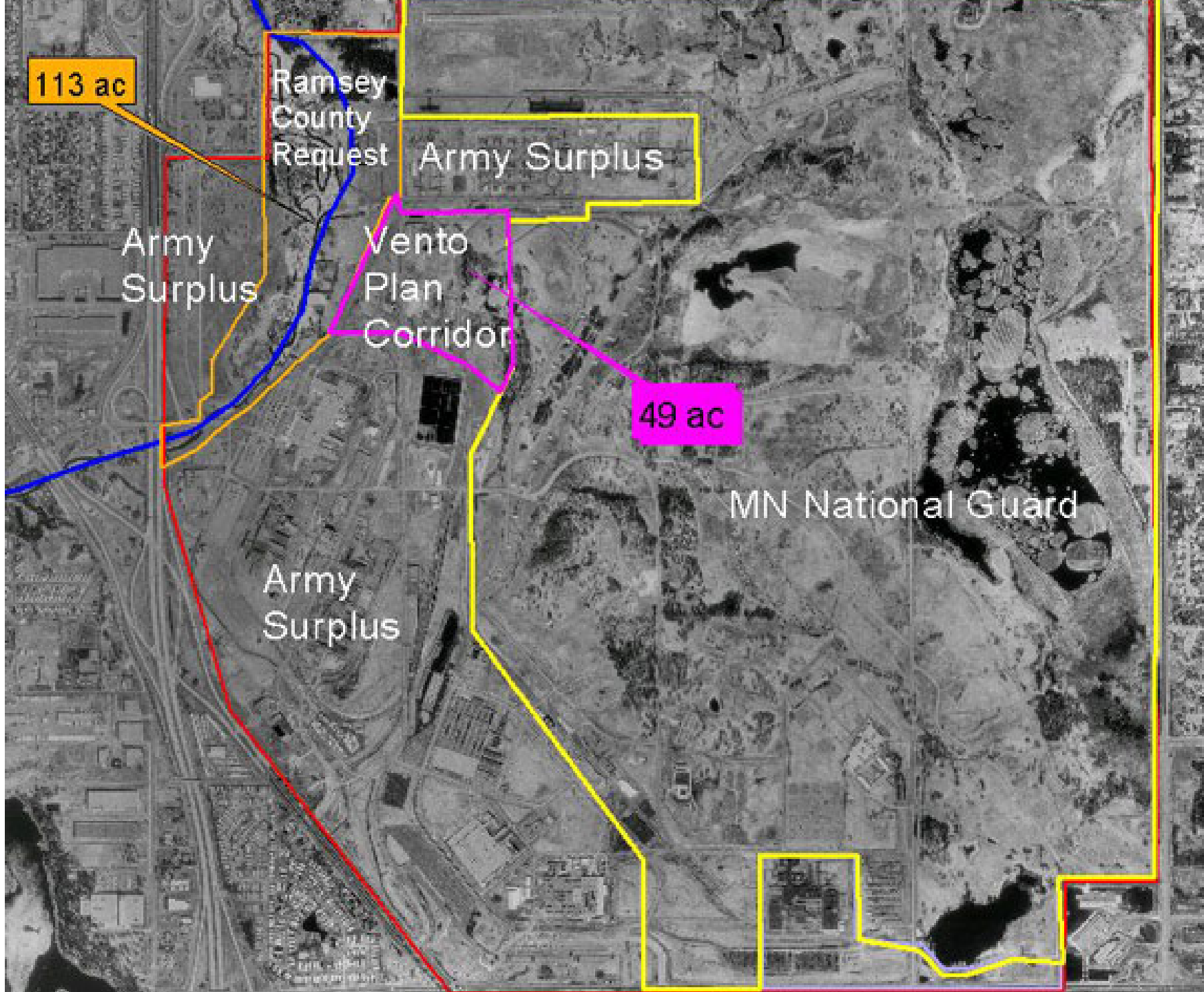






Table 19b. Vento Plan Value Estimate

	<u>High End:</u>			
	<u>Acres:</u>	<u>Value Per Acre:</u>	<u>Value Per Square Foot:</u>	<u>Total Value:</u>
Total Commercial:	210	\$181,981	\$4.18	\$38,216,010
Total Residential Area:	423	\$84,684	\$1.94	\$35,821,332
Total:	633	\$117,148	\$2.69	\$74,037,342

	<u>Low End:</u>			
	<u>Acres:</u>	<u>Value Per Acre:</u>	<u>Value Per Square Foot:</u>	<u>Total Value:</u>
Total Commercial:	210	\$155,724	\$3.57	\$32,702,040
Total Residential Area:	423	\$44,960	\$1.03	\$19,018,080
Total:	633	\$81,836	\$1.88	\$51,720,120

	<u>Best Comparables (#4 and #6):</u>			
	<u>Acres:</u>	<u>Value Per Acre:</u>	<u>Value Per Square Foot:</u>	<u>Total Value:</u>
Total Commercial:	210	\$155,724	\$3.57	\$32,702,040
Total Residential Area:	423	\$59,115	\$1.36	\$25,005,645
Total:	633	\$91,310	\$2.10	\$57,707,685

	<u>Reconciled Value Estimate:</u>			
	<u>Acres:</u>	<u>Value Per Acre:</u>	<u>Value Per Square Foot:</u>	<u>Total Value:</u>
Total Commercial:	210	\$161,833	\$3.72	\$33,984,827
Total Residential Area:	423	\$59,684	\$1.37	\$25,246,519
Total:	633	\$93,720	\$2.15	\$59,231,346

Table 19a. Highest and Best Use Value Estimate

	<u>High End:</u>			
	Acres:	Value Per Acre:	Value Per Square Foot:	Total Value:
Total Commercial:	253	\$181,981	\$4.18	\$46,041,193
Total Residential Area:	380	\$84,684	\$1.94	\$32,179,920
Total:	633	\$123,768	\$2.84	\$78,221,113
	<u>Low End:</u>			
	Acres:	Value Per Acre:	Value Per Square Foot:	Total Value:
Total Commercial:	253	\$155,724	\$3.57	\$39,398,172
Total Residential Area:	380	\$44,960	\$1.03	\$17,084,800
Total:	633	\$89,372	\$2.05	\$56,482,972
	<u>Best Comparables (#4 and #6):</u>			
	Acres:	Value Per Acre:	Value Per Square Foot:	Total Value:
Total Commercial:	253	\$155,724	\$3.57	\$39,398,172
Total Residential Area:	380	\$59,115	\$1.36	\$22,463,700
Total:	633	\$97,883	\$2.25	\$61,861,872
	<u>Reconciled Value Estimate:</u>			
	Acres:	Value Per Acre:	Value Per Square Foot:	Total Value:
Total Commercial:	253	\$161,833	\$3.72	\$40,943,625
Total Residential Area:	380	\$59,684	\$1.37	\$22,680,088
Total:	633	\$100,670	\$2.31	\$63,623,713

Changes in the Highest and Best Use of Property

Legal permissibility

Physical adaptability

Financial feasibility

Maximal productivity

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Southwesterly View of Shoreline West of Former Plant Site
Photo by SMCarlson, August 27, 2004



Easterly View of Shoreline from Scout Camping Area West of Former Plant Site
Photo by SMCarlson, August 27, 2004

Big Rock Power Plant Site

Charlevoix, Michigan

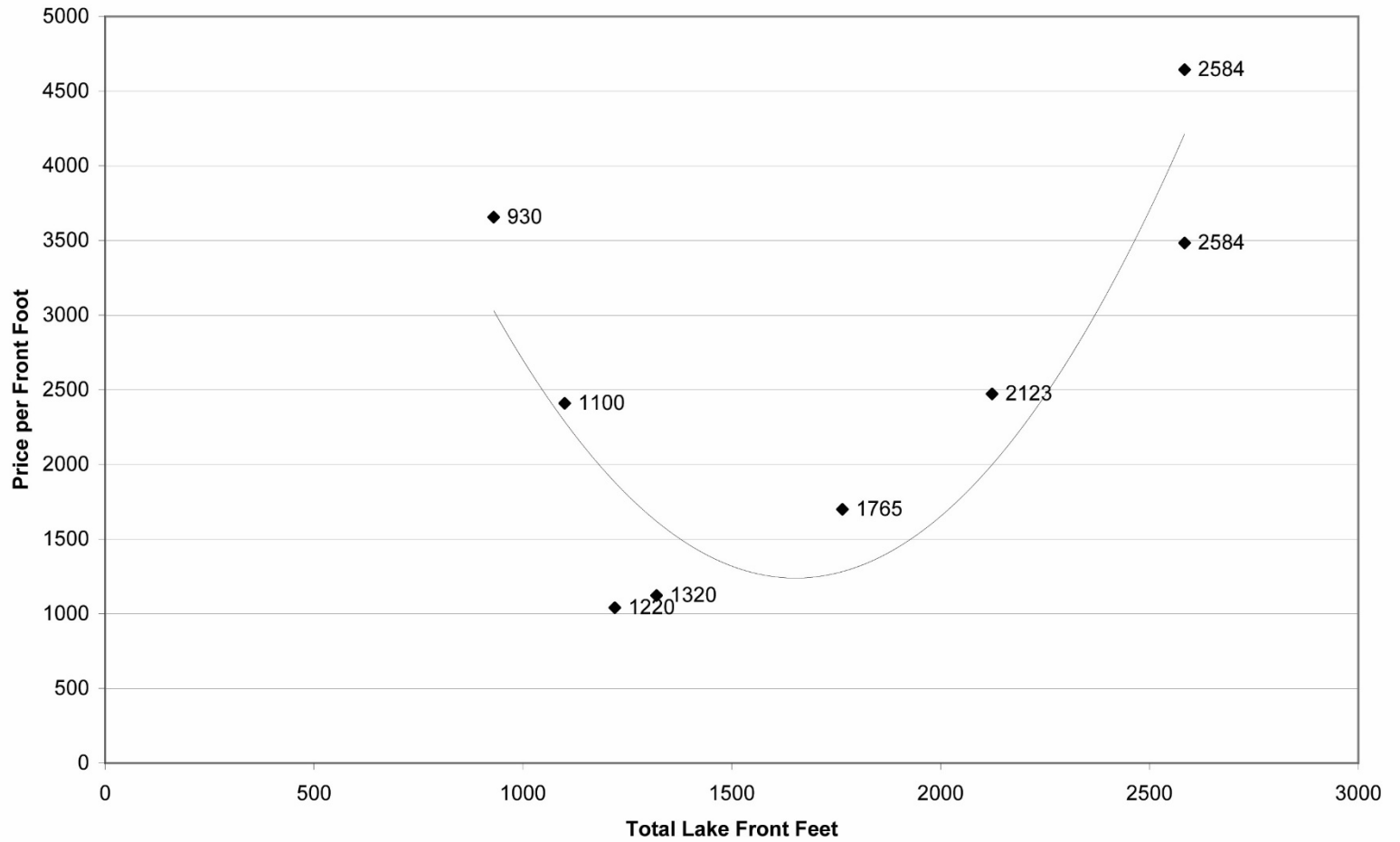
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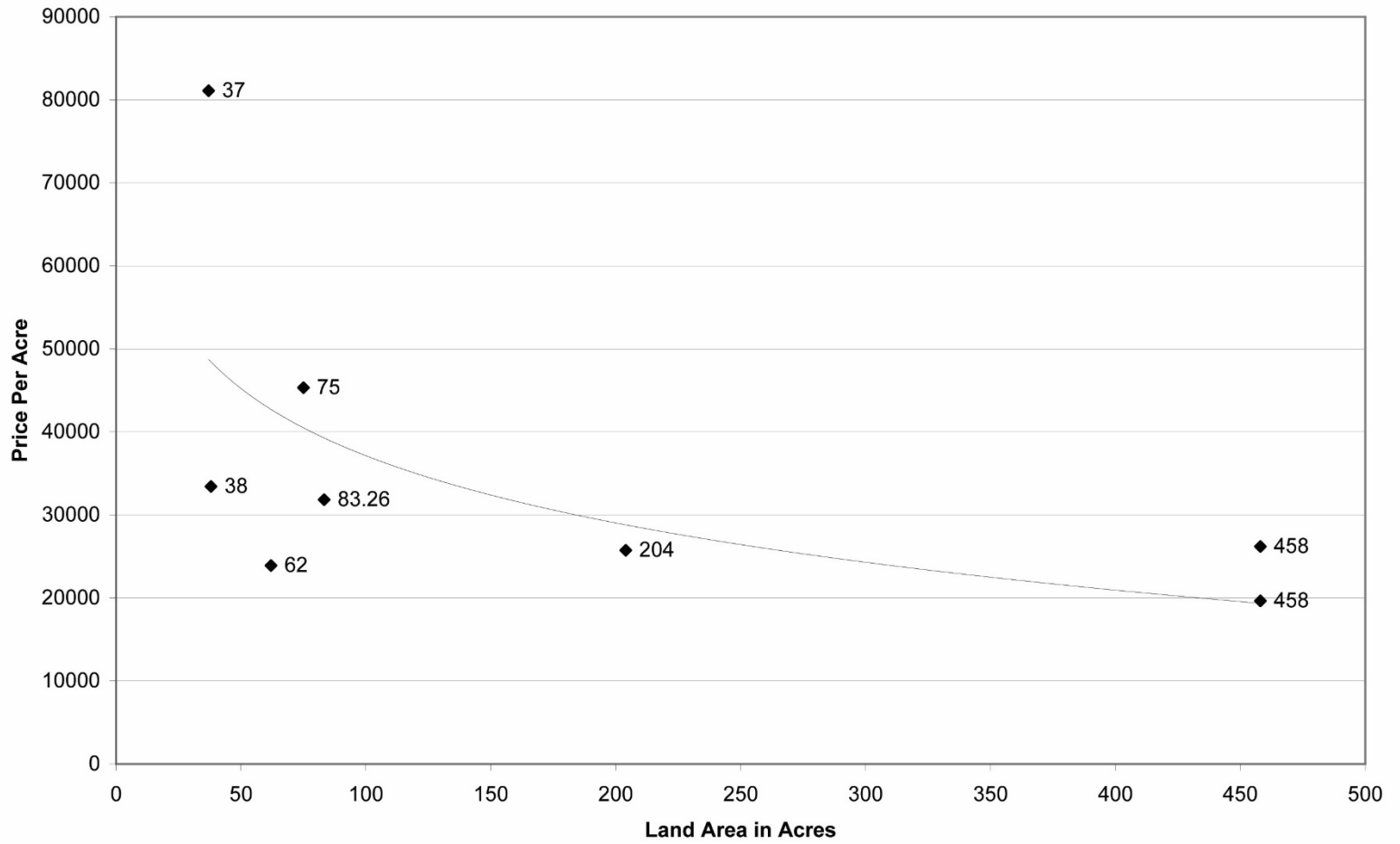


Figure 21. Total Lake Front Feet vs. Price Per Front Foot



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Figure 22. Land Area in Acres vs. Price Per Acre



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Figure 24. Front Feet per Acre vs. Price Per Acre

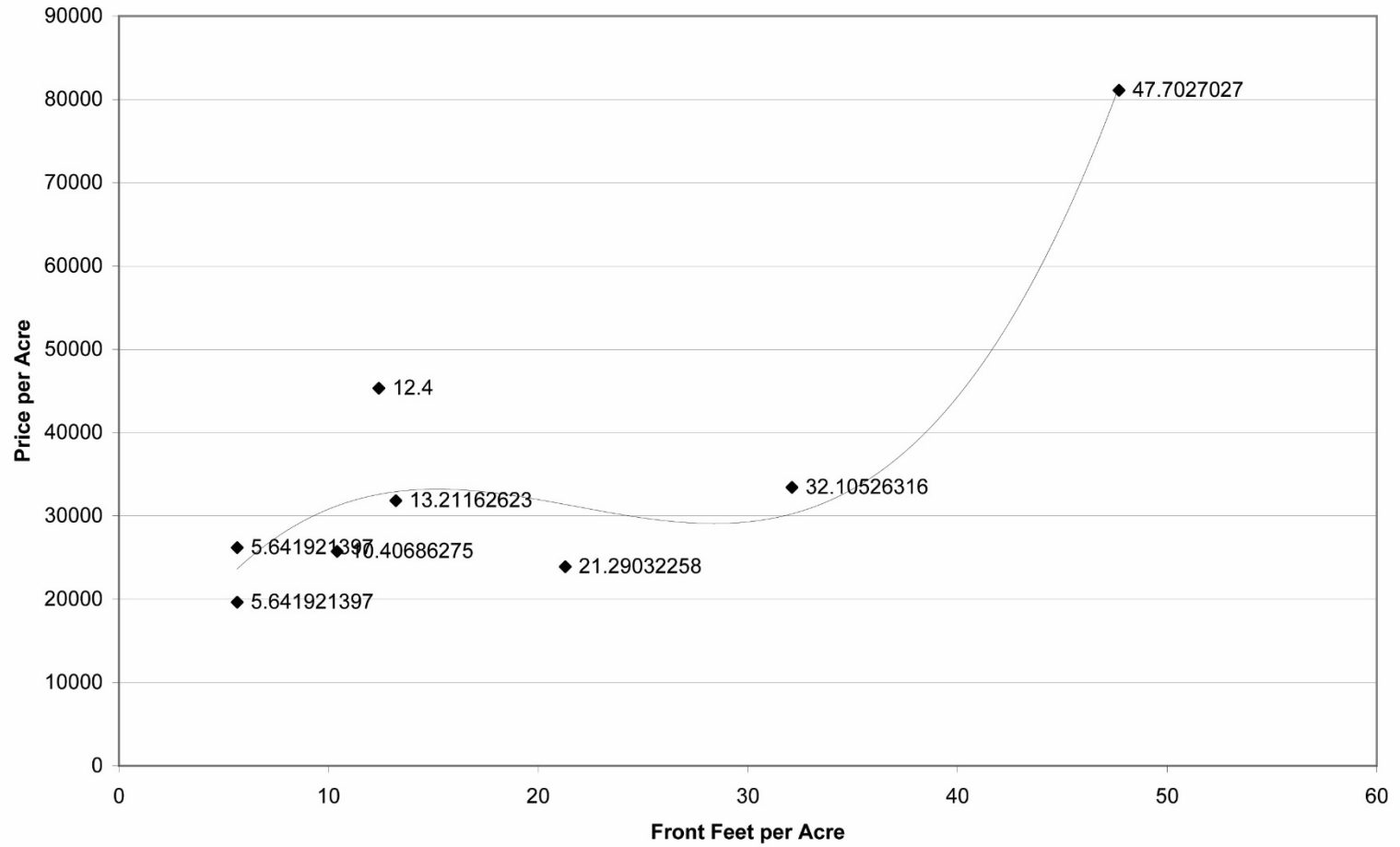
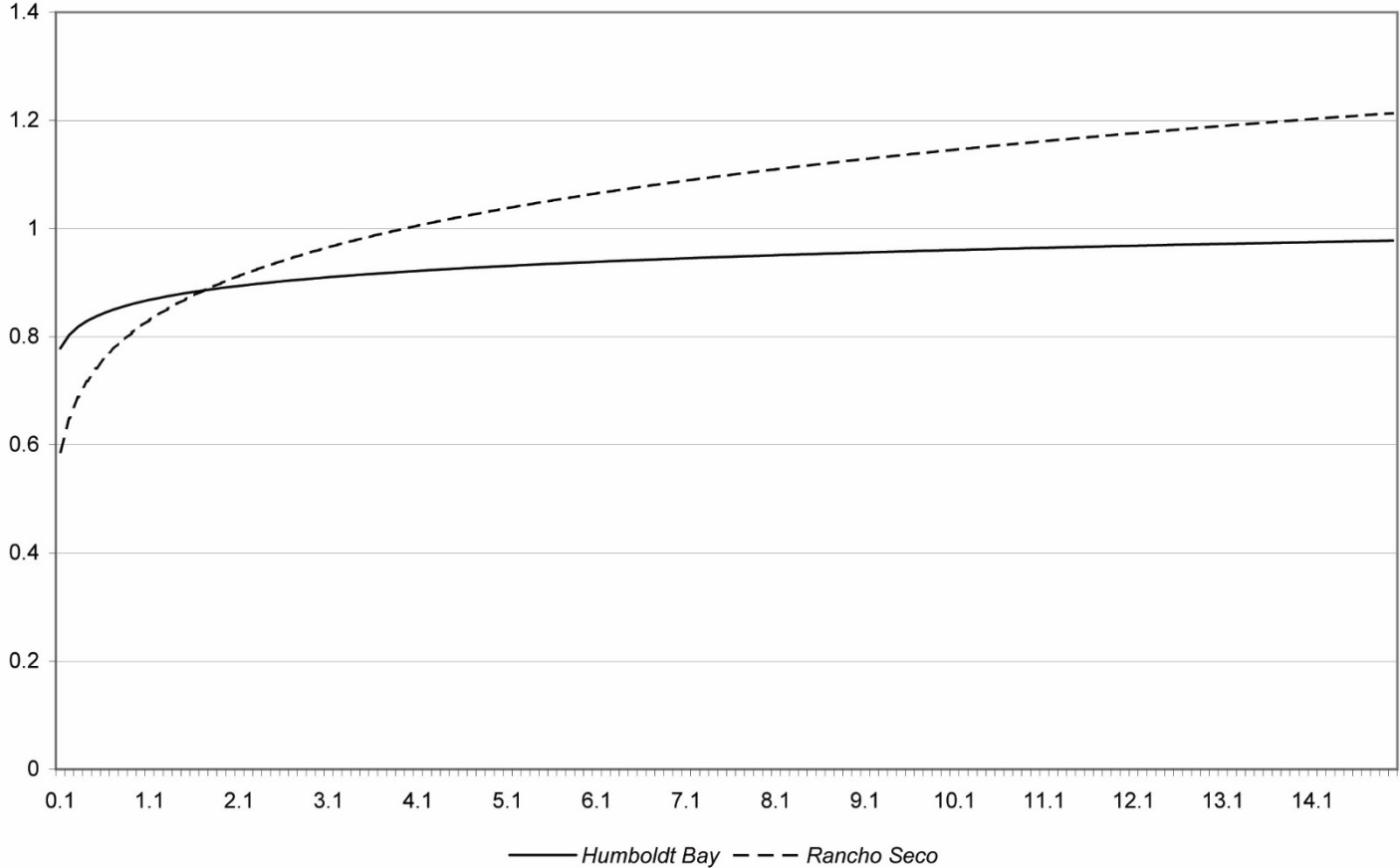


Figure 28. Proportional Price Effects of the Humboldt Bay and Rancho Seco Nuclear Facilities



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The Impact of Transit Easements on Residential Property Values

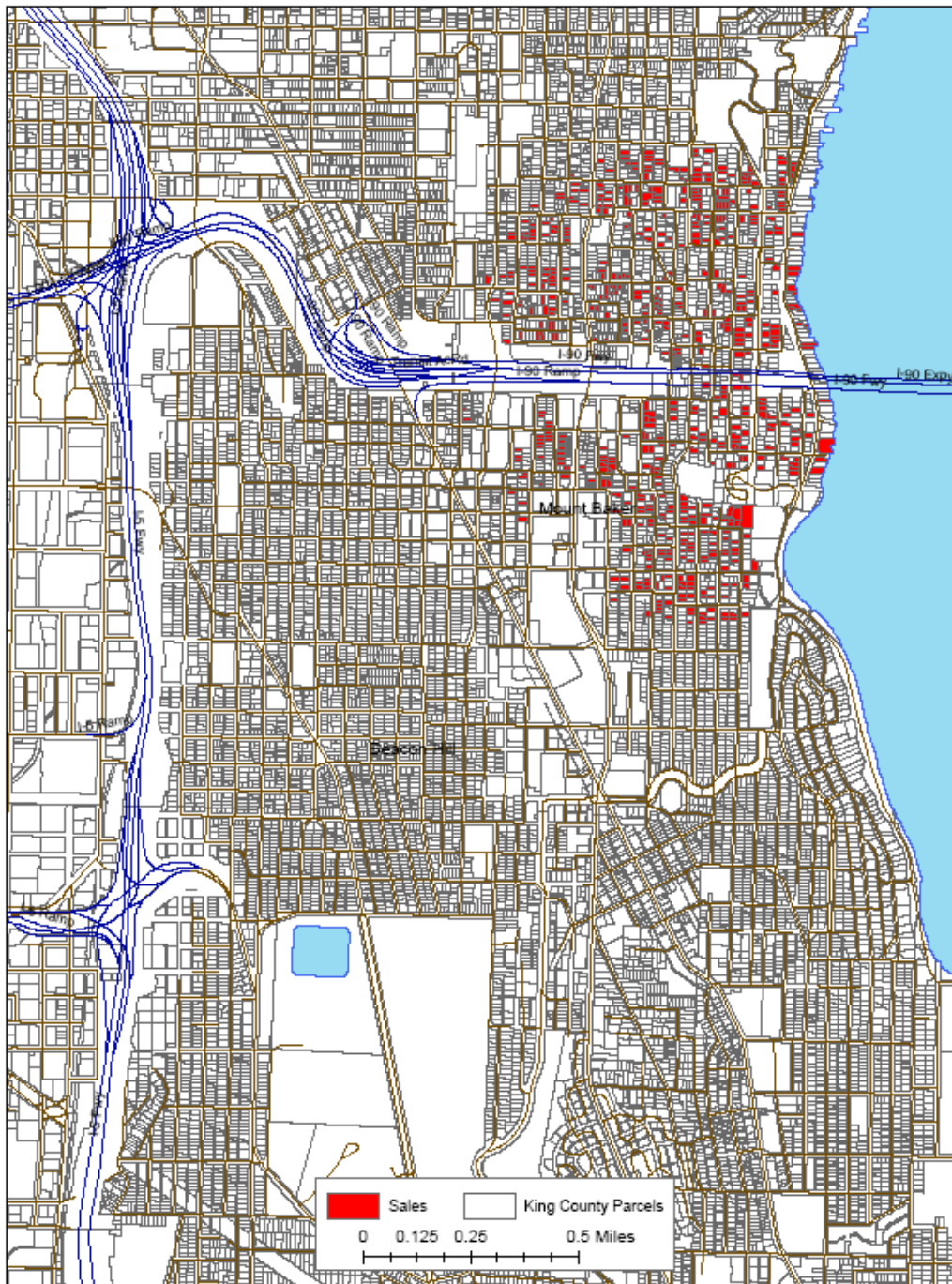
Journal of Real Estate Research, 2007

John A. Kilpatrick
Ron Throupe
Andy Krause
Greenfield Advisors

John I. Carruthers
U.S. Dept. of Housing & Urban Development

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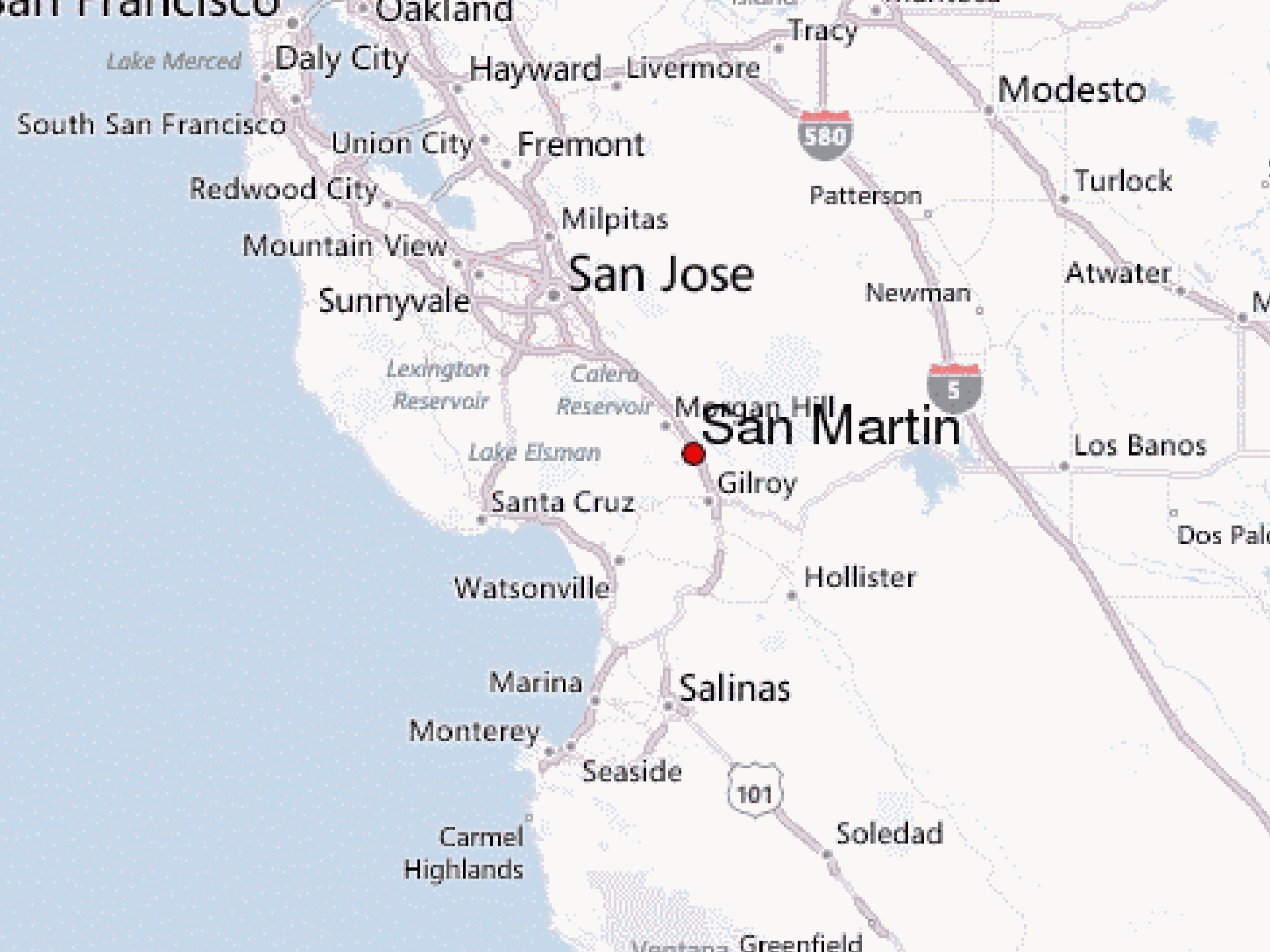
Application of Repeat Sales Analysis to Determine the Impact of a Contamination Event

Journal of Housing Research, 2006

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San Francisco

Oakland

Lake Merced

Daly City

Hayward

Livermore

Tracy

Modesto

South San Francisco

Union City

Fremont

580

Patterson

Turlock

Redwood City

Milpitas

Mountain View

San Jose

Newman

Atwater

Sunnyvale

Lexington Reservoir

Calera Reservoir

San Martin

5

Los Banos

Lake Elstman

Santa Cruz

Gilroy

Dos Palos

Watsonville

Hollister

Marina

Salinas

Monterey

Seaside

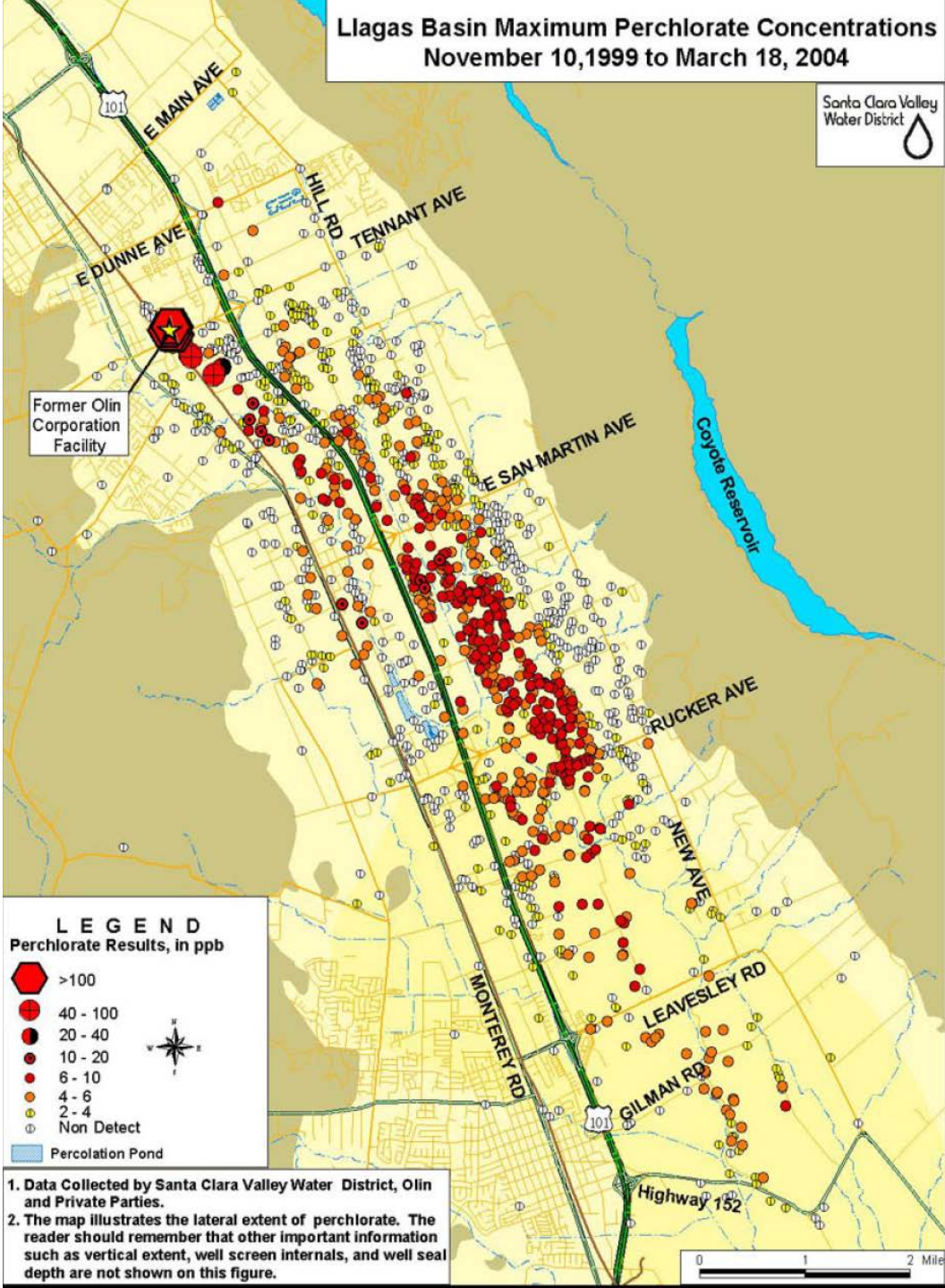
101

Soledad

Carmel Highlands

Merced Greenfield

Llagas Basin Maximum Perchlorate Concentrations November 10, 1999 to March 18, 2004



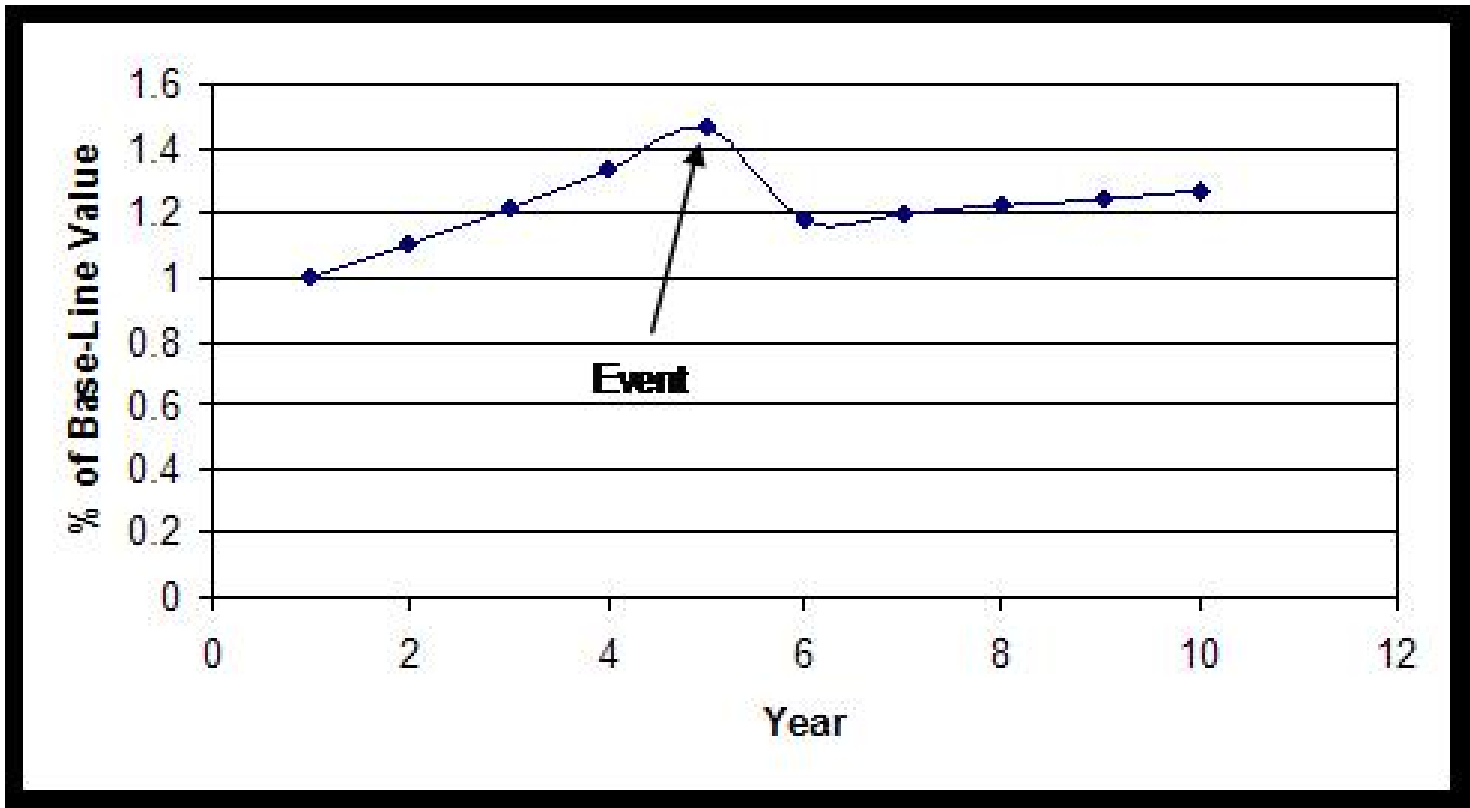
LEGEND
Perchlorate Results, in ppb

- >100
- 40 - 100
- 20 - 40
- 10 - 20
- 6 - 10
- 4 - 6
- 2 - 4
- Non Detect
- Percolation Pond

1. Data Collected by Santa Clara Valley Water District, Olin and Private Parties.
2. The map illustrates the lateral extent of perchlorate. The reader should remember that other important information such as vertical extent, well screen such as vertical extent, well screen such as vertical extent, well seal depth are not shown on this figure.



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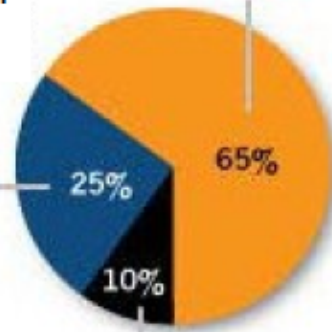


THE COMPANIES INVOLVED

The owners

Owners of Mississippi Canyon Block 252 license where the well was drilled.

The Partners are liable for costs in proportion to their holdings.



The Operators and Contractors

Transocean

BP Leased the Deepwater Horizon rig from TransOcean, The world's largest offshore drilling firm.



The Blowout equipment which failed on the rig was provided by Cameron International Corp, a subsidiary of TransOcean.

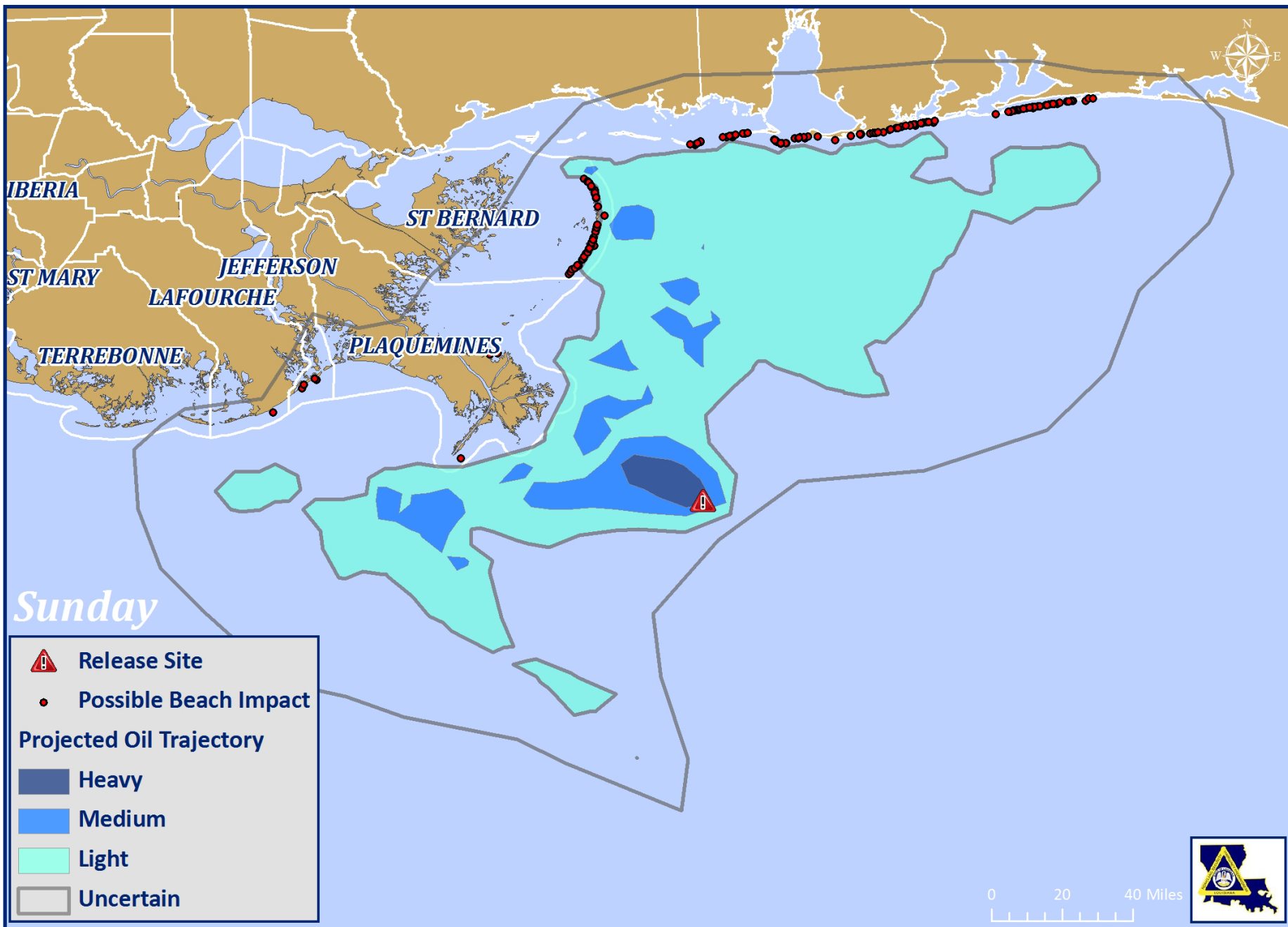
HALLIBURTON

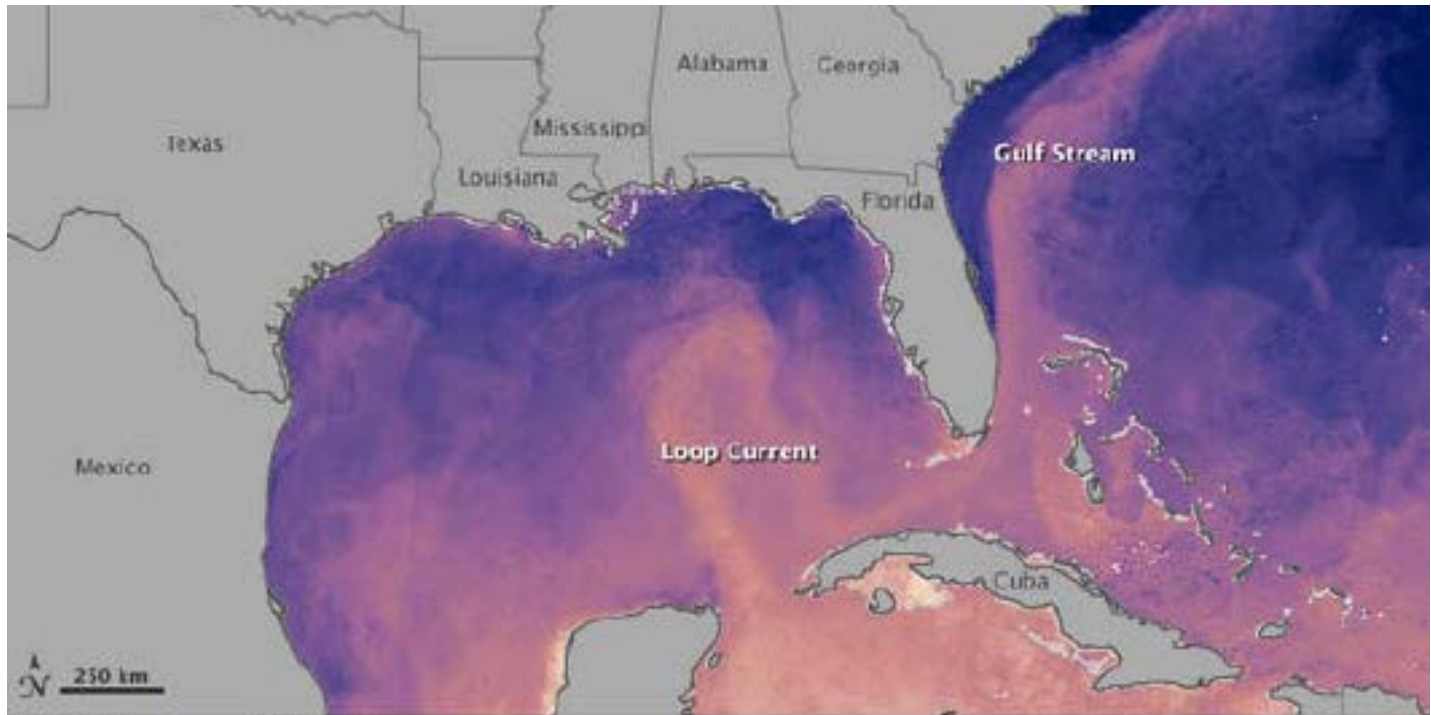
Halliburton Energy Services Inc, provided drilling services on the rig. Halliburton was the process of cementing the wellhead when the blowout occurred.

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Mississippi Canyon 252 - Projected Trajectory 27 June 2010, 1200





The “Loop Current” around Florida



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www.gulfspillvaluations.com



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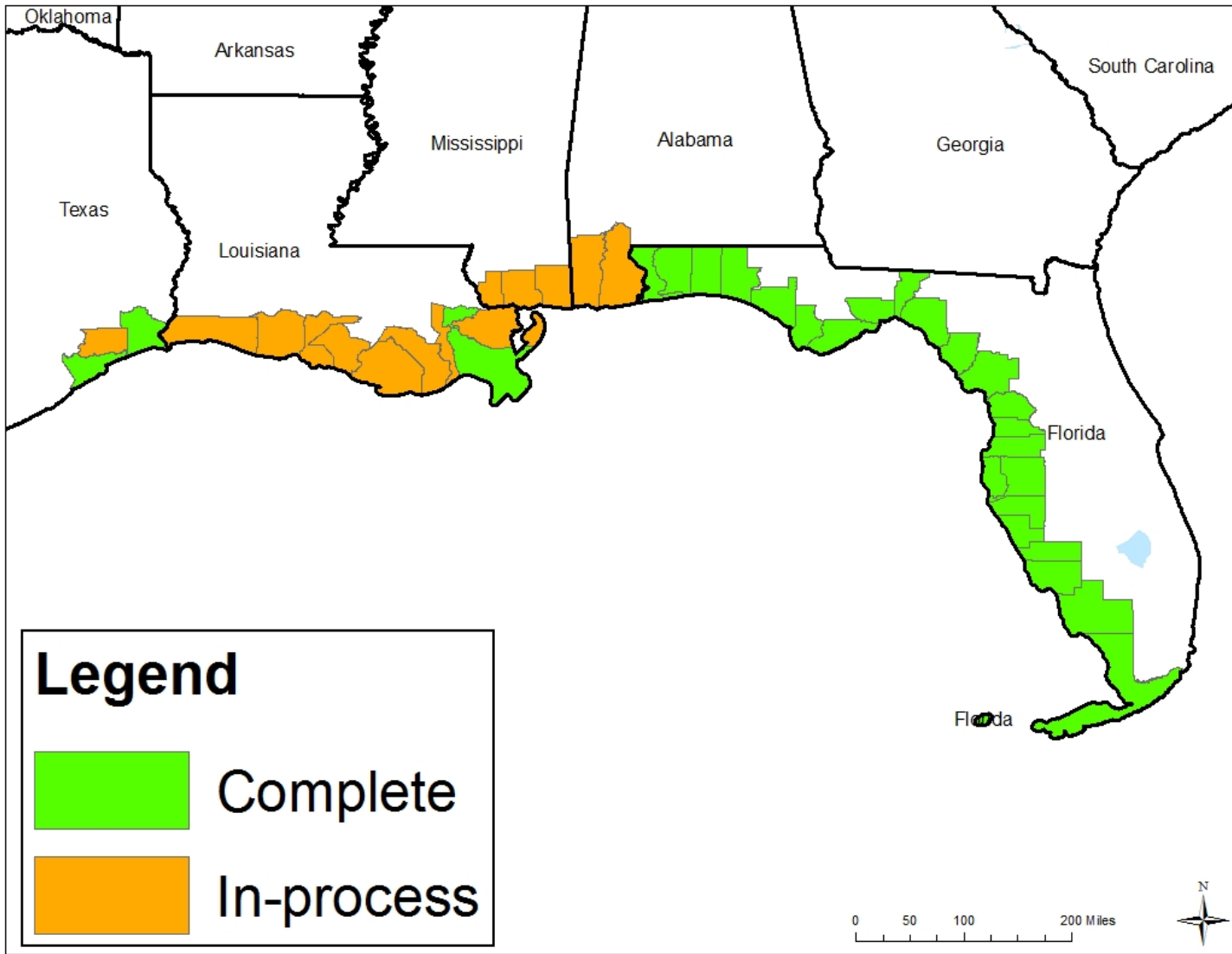
GET YOUR PROPERTY'S
VALUATION REPORT
INSTANTLY FOR \$500

Gulf **Spill** Valuations

OFFERING REAL ESTATE ANALYSIS FOR BP OIL SPILL CLAIMS

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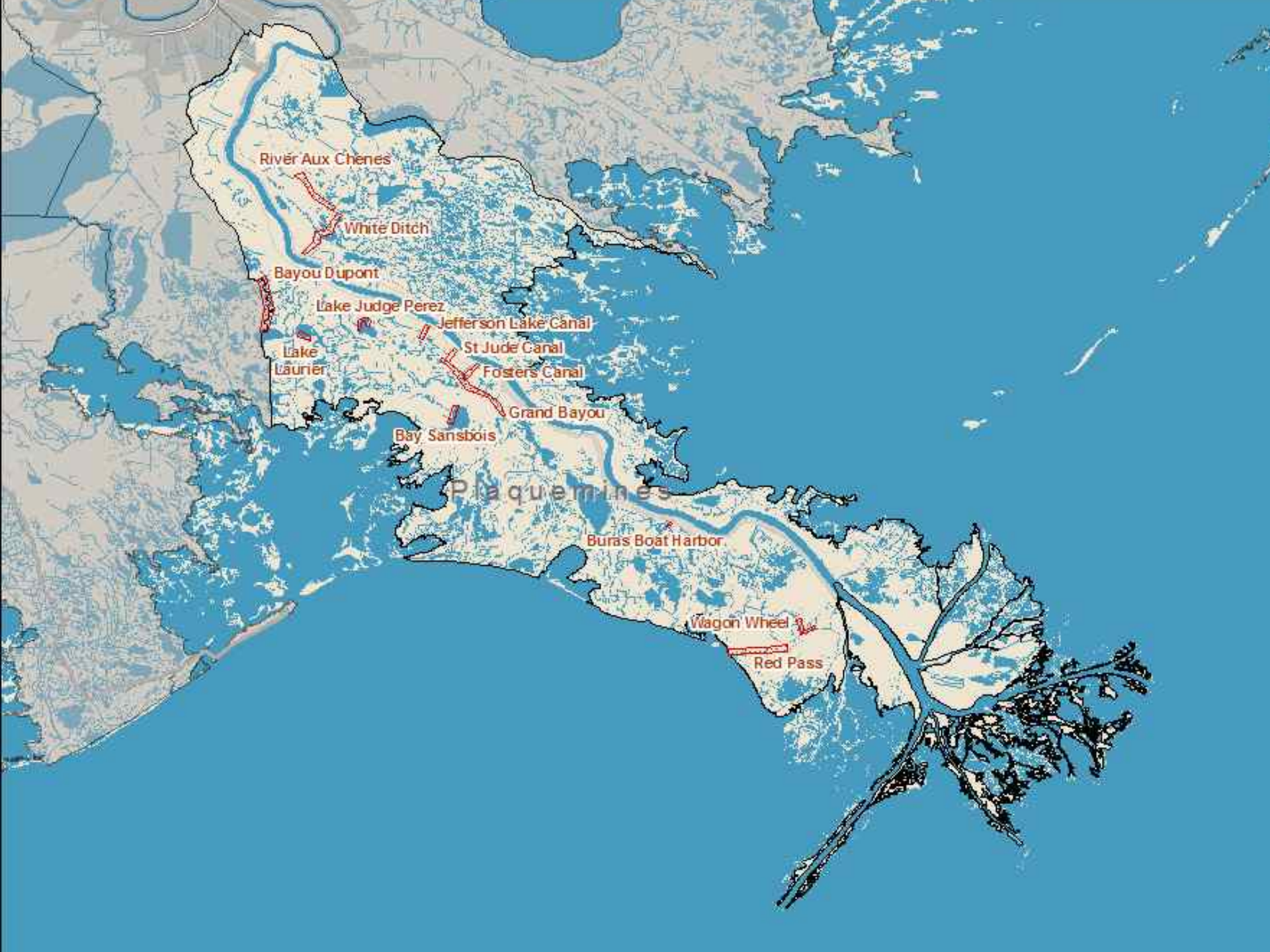


PLAQUEMINES PARISH



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Rivier Aux Chenes

White Ditch

Bayou Dupont

Lake Judge Perez

Jefferson Lake Canal

Lake Laurier

St Jude Canal

Fosters Canal

Grand Bayou

Bay Sansbois

Plaquemines

Buras Boat Harbor

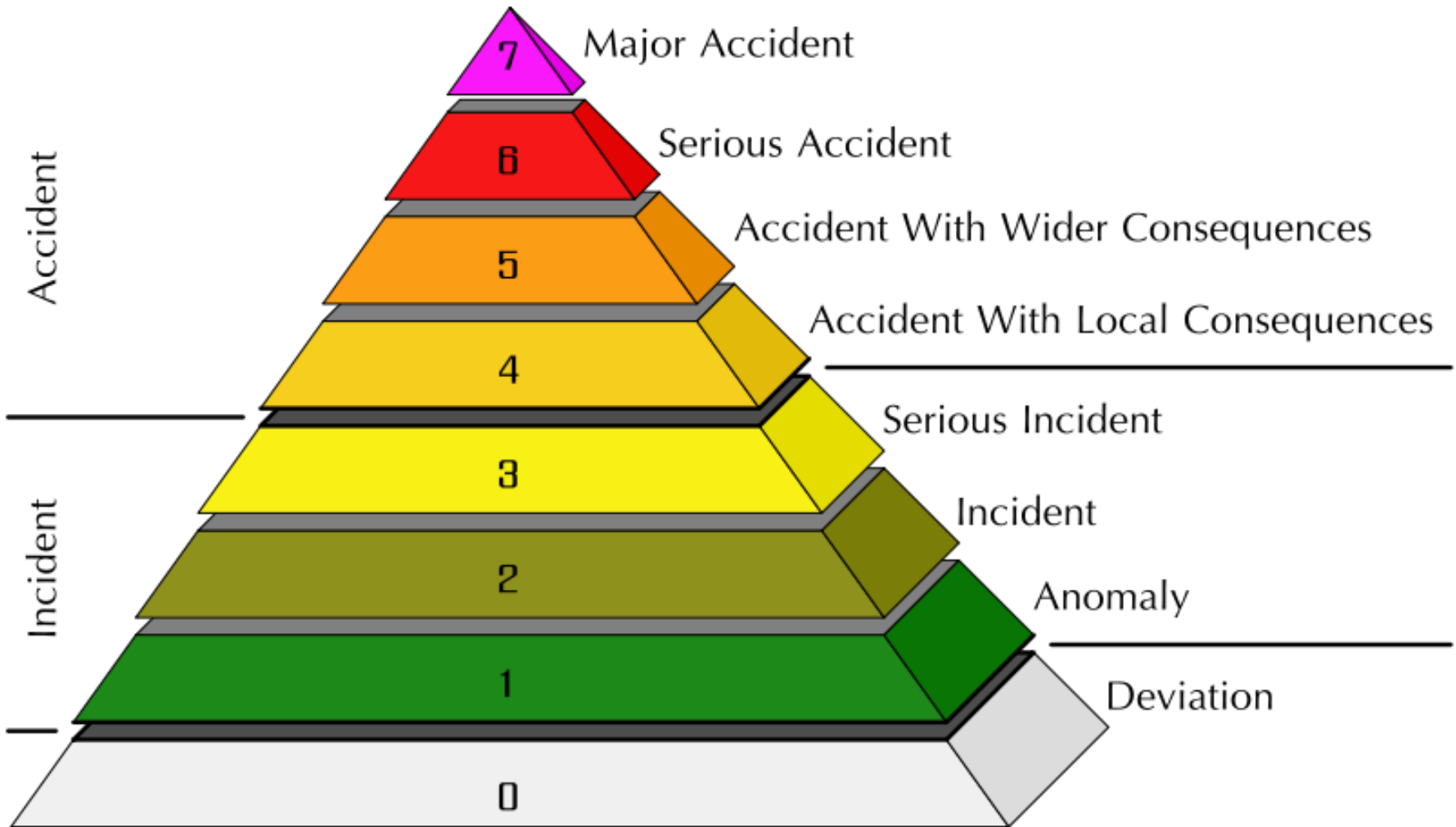
Wagon Wheel

Red Pass



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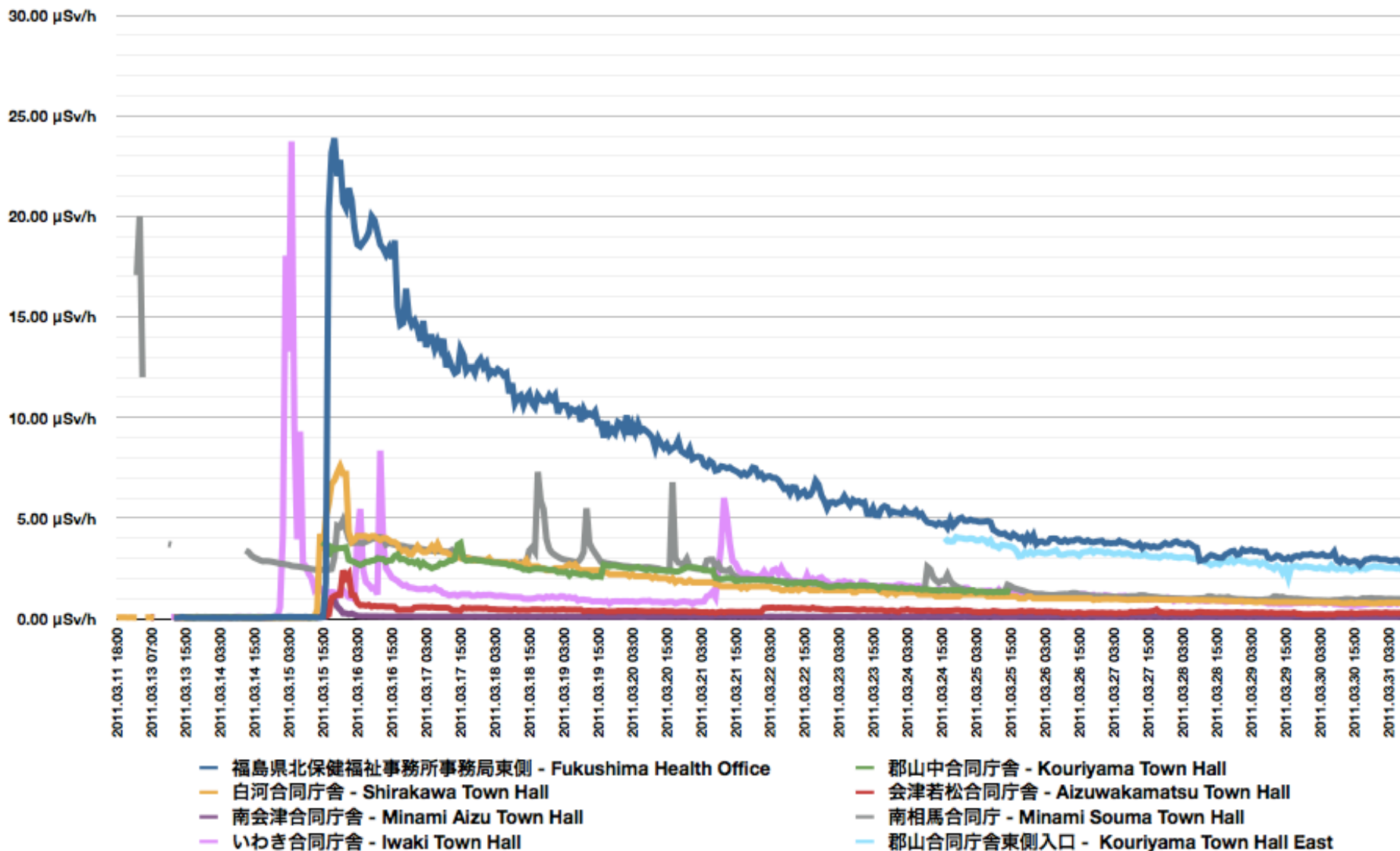




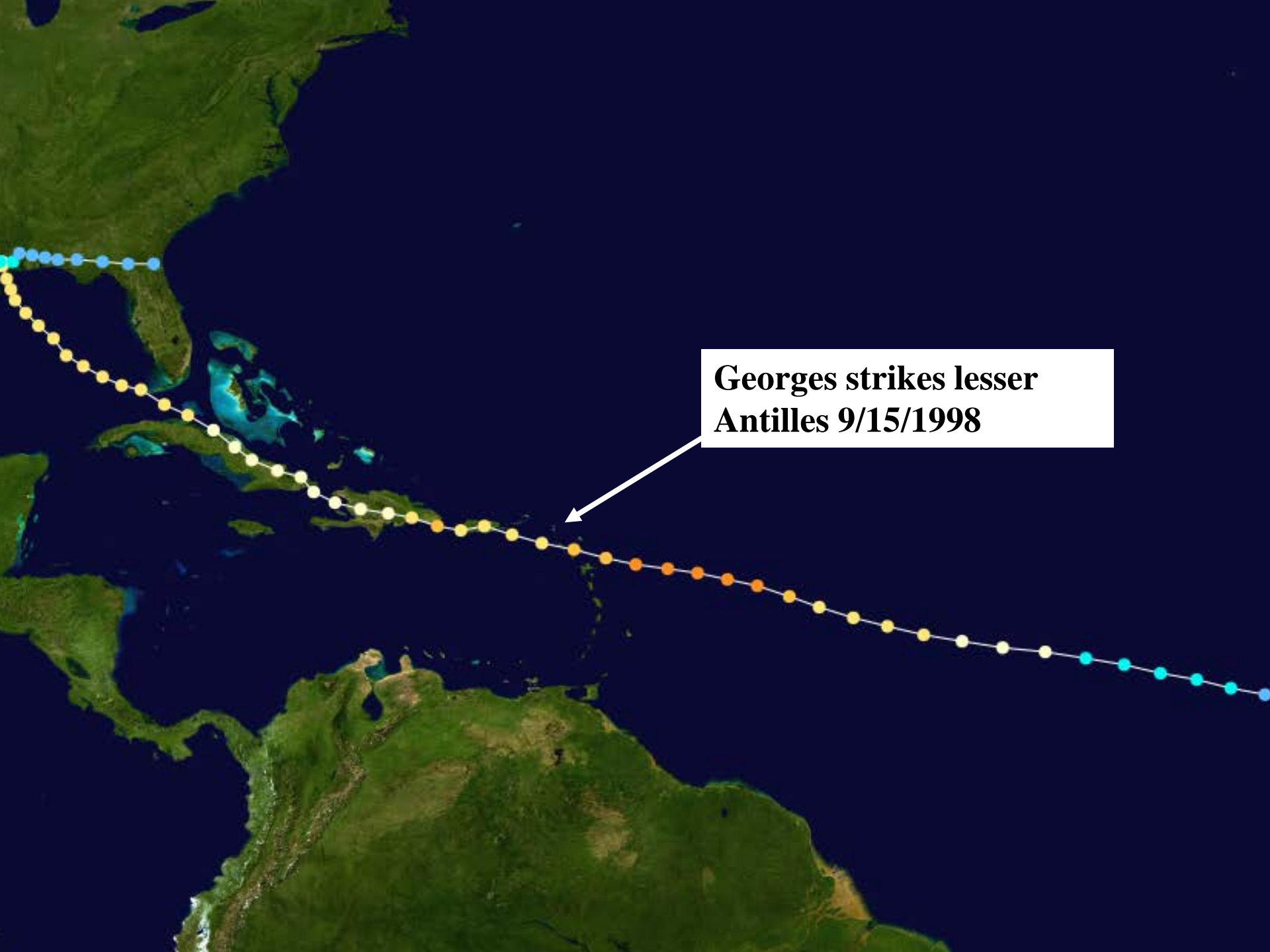


福島県の放射線量 - Fukushima Prefecture Radiation Levels

2011.03.11 18:00 ~ 2011.03.31 08:00



Data from <http://www.pref.fukushima.jp/>



**Georges strikes lesser
Antilles 9/15/1998**

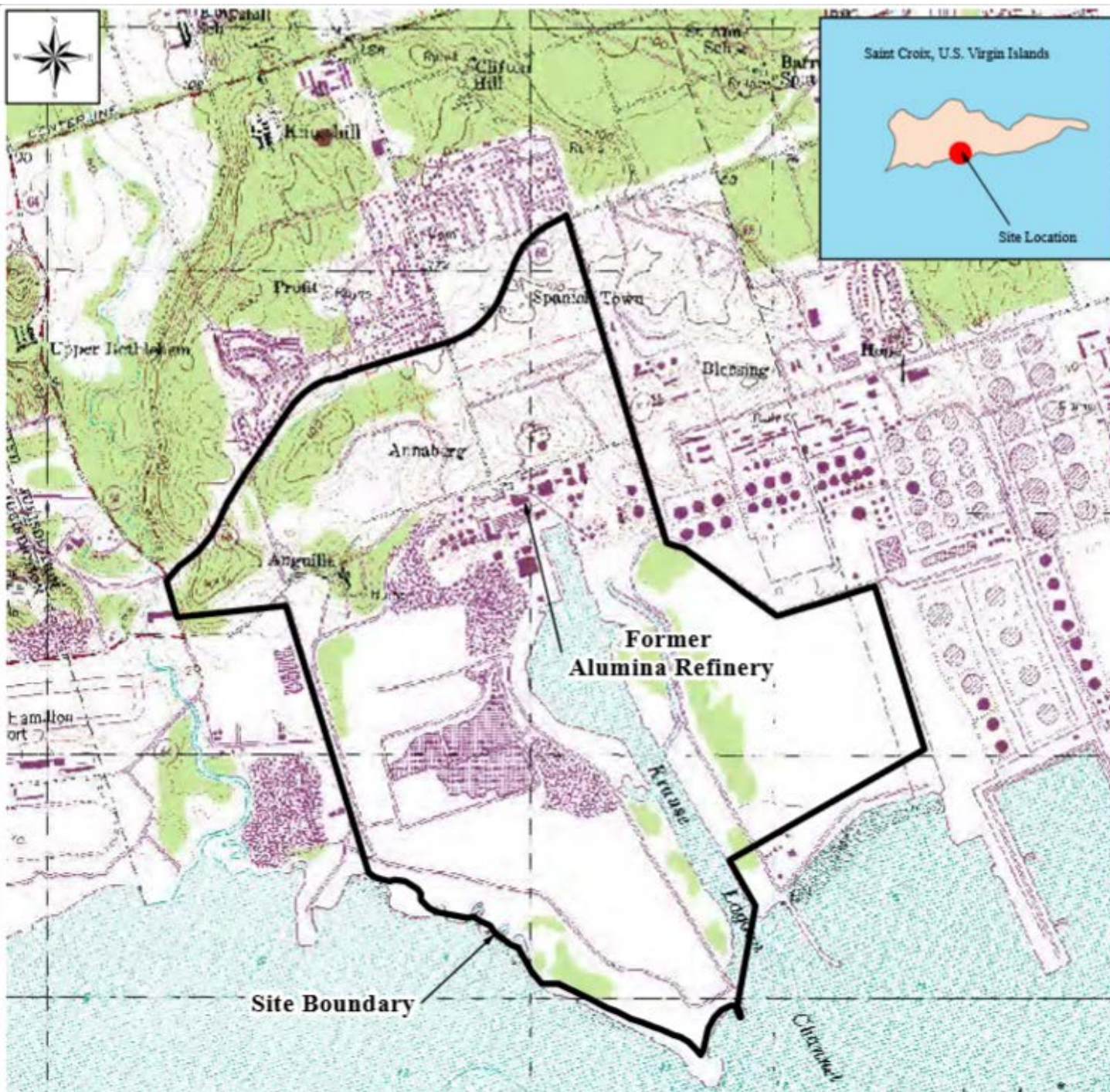
ST. CROIX



St Croix Alumina Plant

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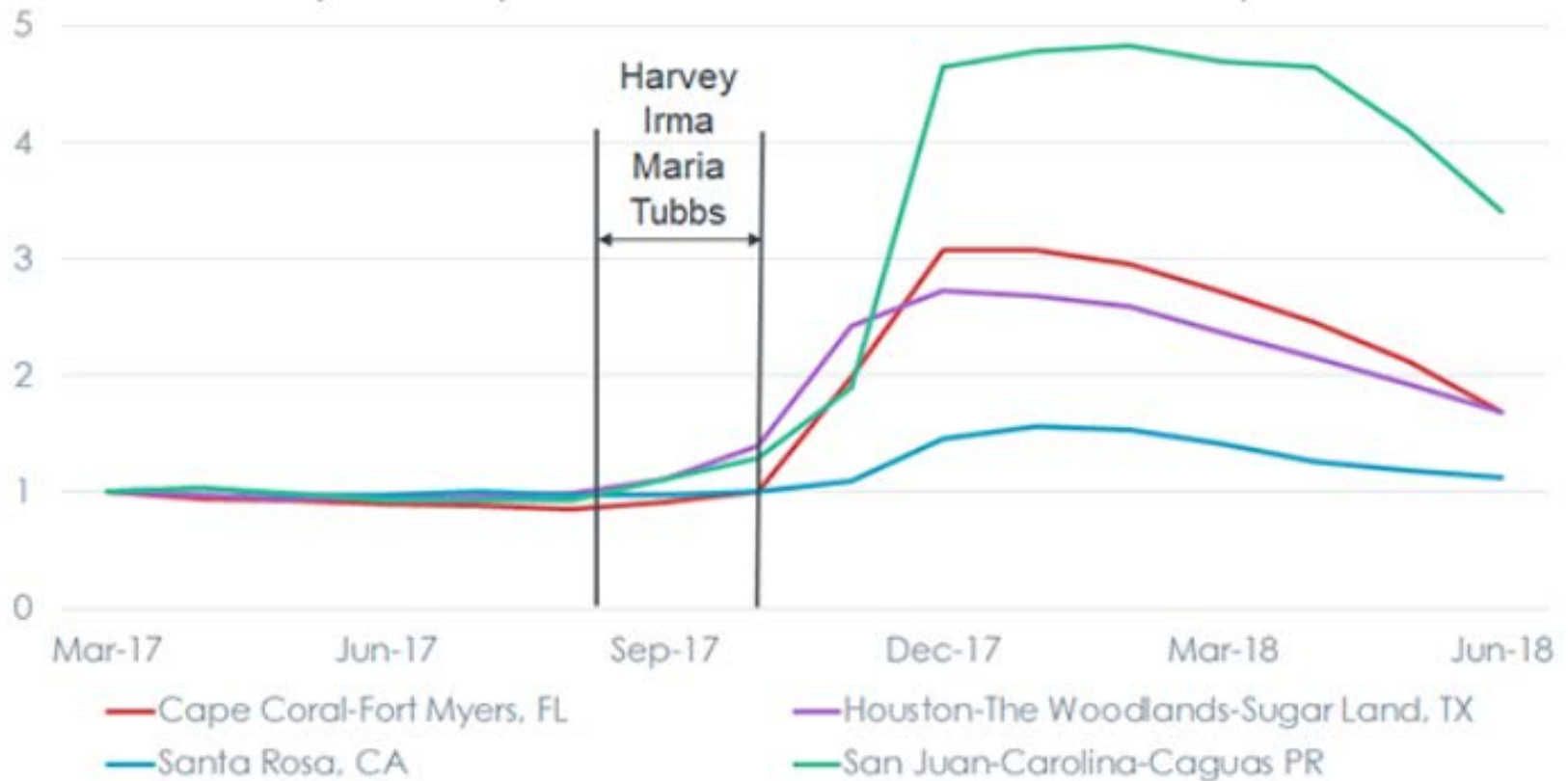


St Croix Alumina Plant

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Serious Delinquency Rate (as a multiple of the metro-area rate in March 2017)



Source: CoreLogic TrueStandings Servicing, percent of loans that were 90-or-more days delinquent or in foreclosure measured relative to March 2017

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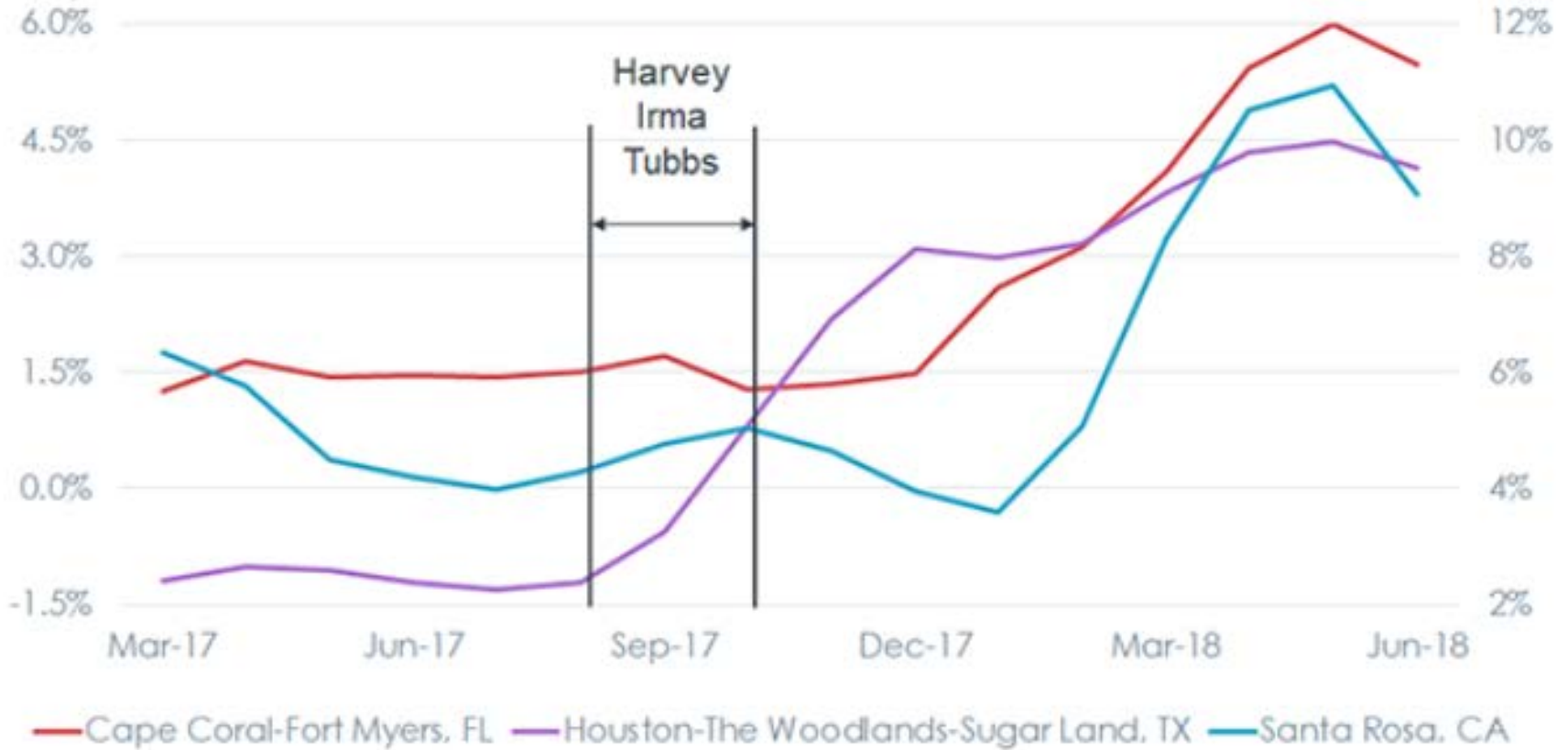
Courtesy Frank Nothaft, CoreLogic

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Annual Rent Growth,
Cape Coral and Houston Metros

Annual Rent Growth,
Santa Rosa Metro



Source: CoreLogic Single-Family Rent Index (Cape Coral and Houston) and Rental Trends (Santa Rosa, 2-bedroom median rent, 3-month moving average)

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Courtesy Frank Nothaft, CoreLogic

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Key Valuation Considerations

Impact on the highest and best use of properties

Market equilibrium disruptions

Model efficiency

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Key Valuation Considerations

Impact on the highest and best use of properties

→ Many uses will no longer be financially feasible or even physically possible

Market equilibrium disruptions

Model efficiency

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Key Valuation Considerations

Impact on the highest and best use of properties

→ Many uses will no longer be financially feasible or even physically possible

Market equilibrium disruptions

→ Data may not longer be available, or properly indicative of value

Model efficiency

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Key Valuation Considerations

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Model efficiency

→ Systematic models are preferred, to look at markets holistically

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Continental United States Hurricane Strikes 1950 - 2007



Saffir-Simpson Hurricane Categories (at Strike or Landfall)

Sustained Winds (MPH)

- 74-95 ● Category 1
- 96-110 ● Category 2
- 111-130 ● Category 3
- 131-155 ● Category 4
- >155 ● Category 5

There were no hurricane strikes in the U.S. for the period 2000, 2001, 2006.

Due to density of storms in some locations, actual strike locations are approximate.

* **STRIKES**- includes hurricanes that did not make direct landfall, but did produce hurricane force winds over land.

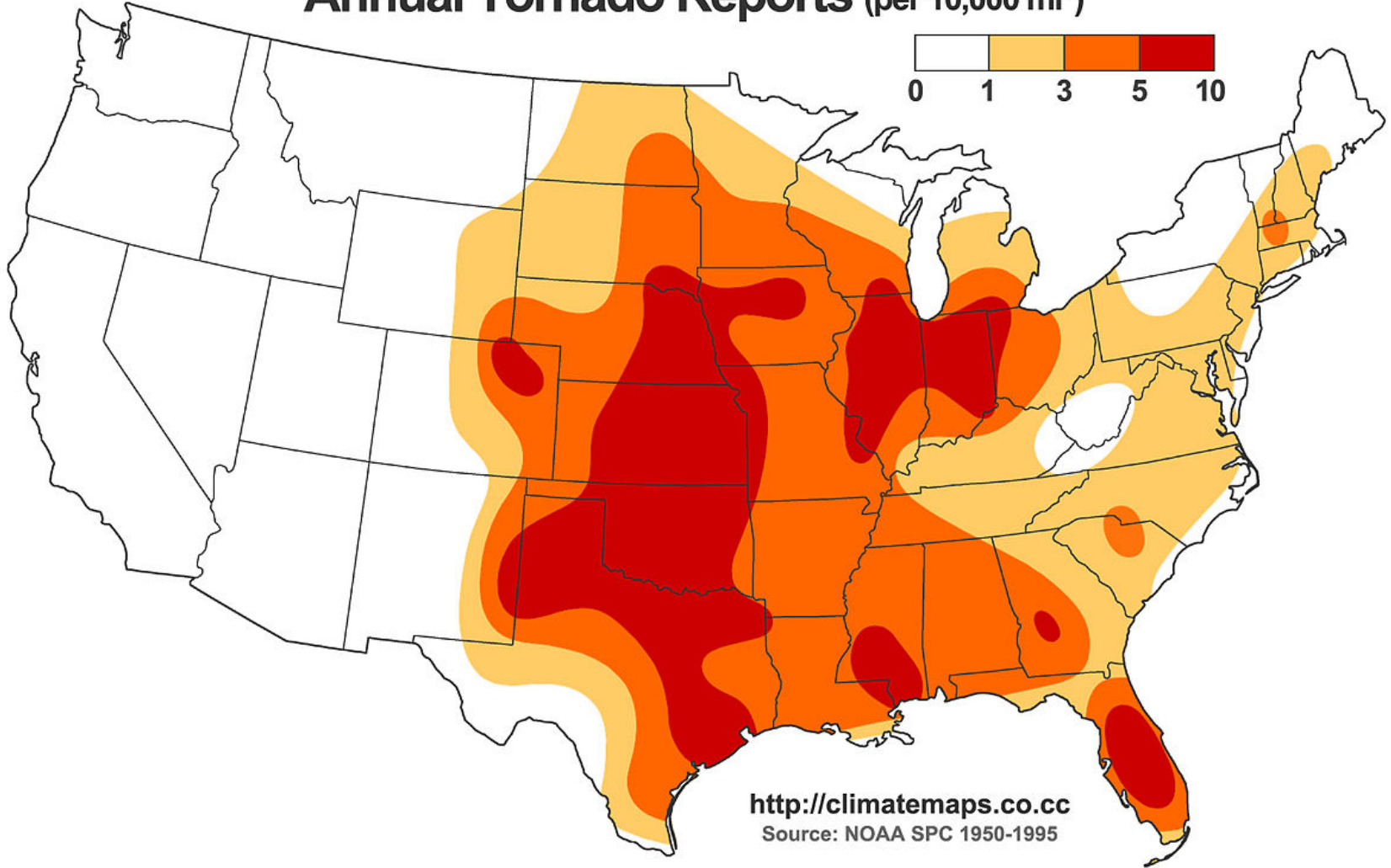
NOAA's National Climatic Data Center ■ Asheville, North Carolina
Protecting the past ... Revealing the future

294 strikes since 1851

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Annual Tornado Reports (per 10,000 mi²)



<http://climatemaps.co.cc>

Source: NOAA SPC 1950-1995

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Wildfire Activity by County 1994-2013

USGS Federal Fire Occurrence Database, including US Forest Service, Bureau of Indian Affairs, and Bureau of Land Management

Frequency of Wildfires Greater or Equal to 300 Acres, From 1994-2013

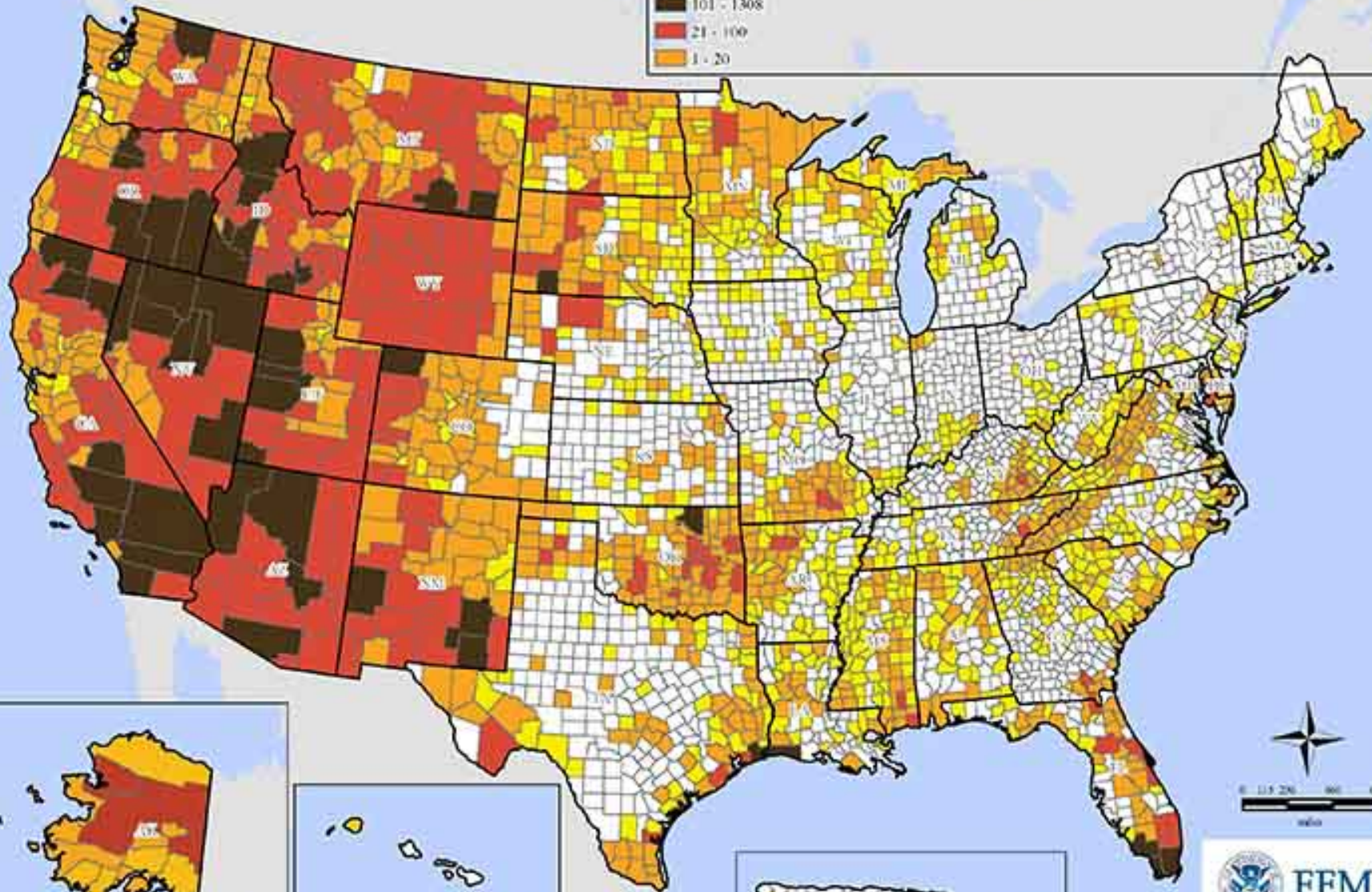
Countries Where Largest Wildfire is Less Than 300 Acres

No Recorded Wildfires

101 - 1308

21 - 100

1 - 20



GIS Mapping & Analysis Center
Washington, DC

01/13/14

Sources: ESSR, USGS

Wildfire Activity by County 1994-2013

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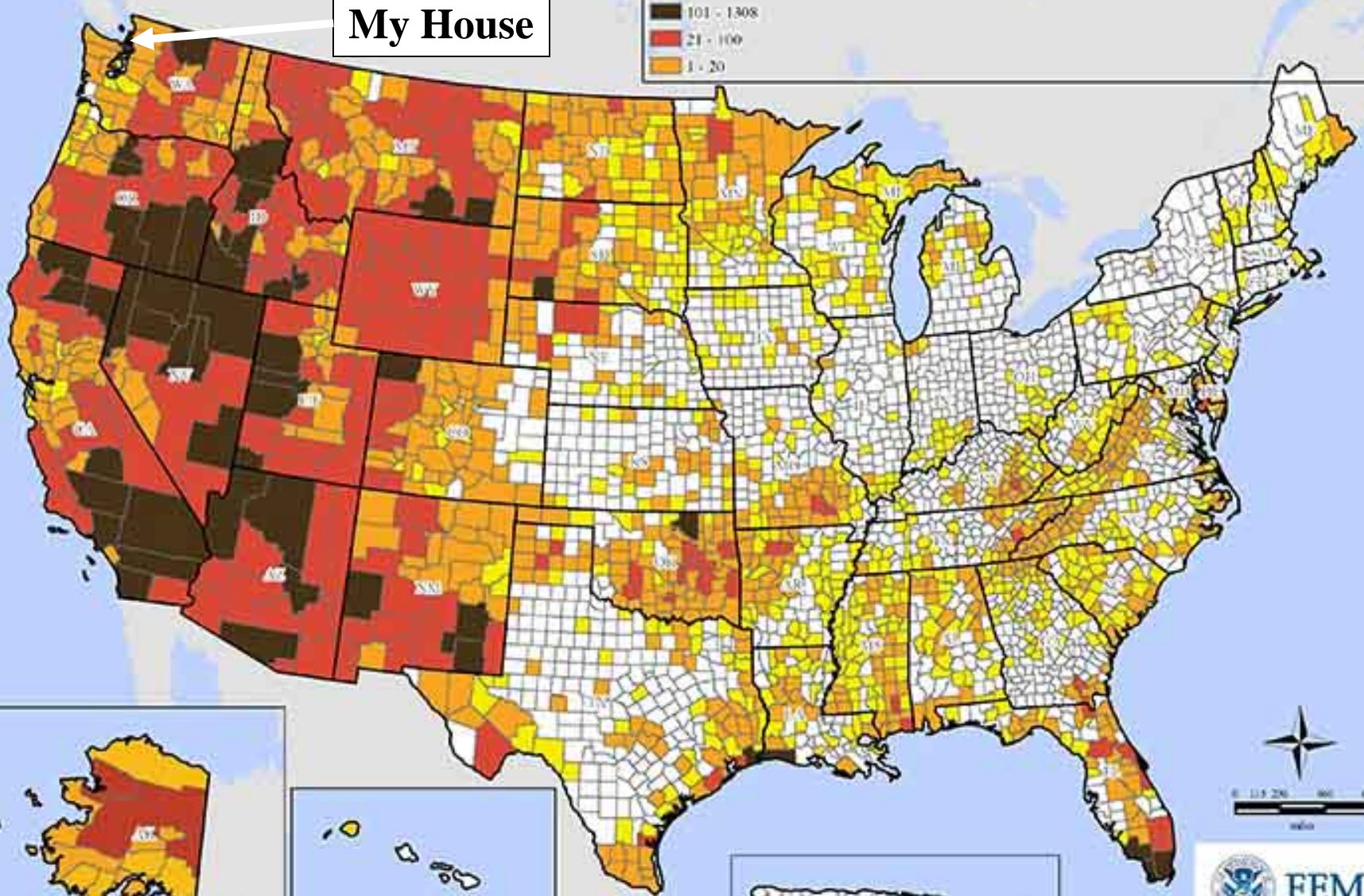
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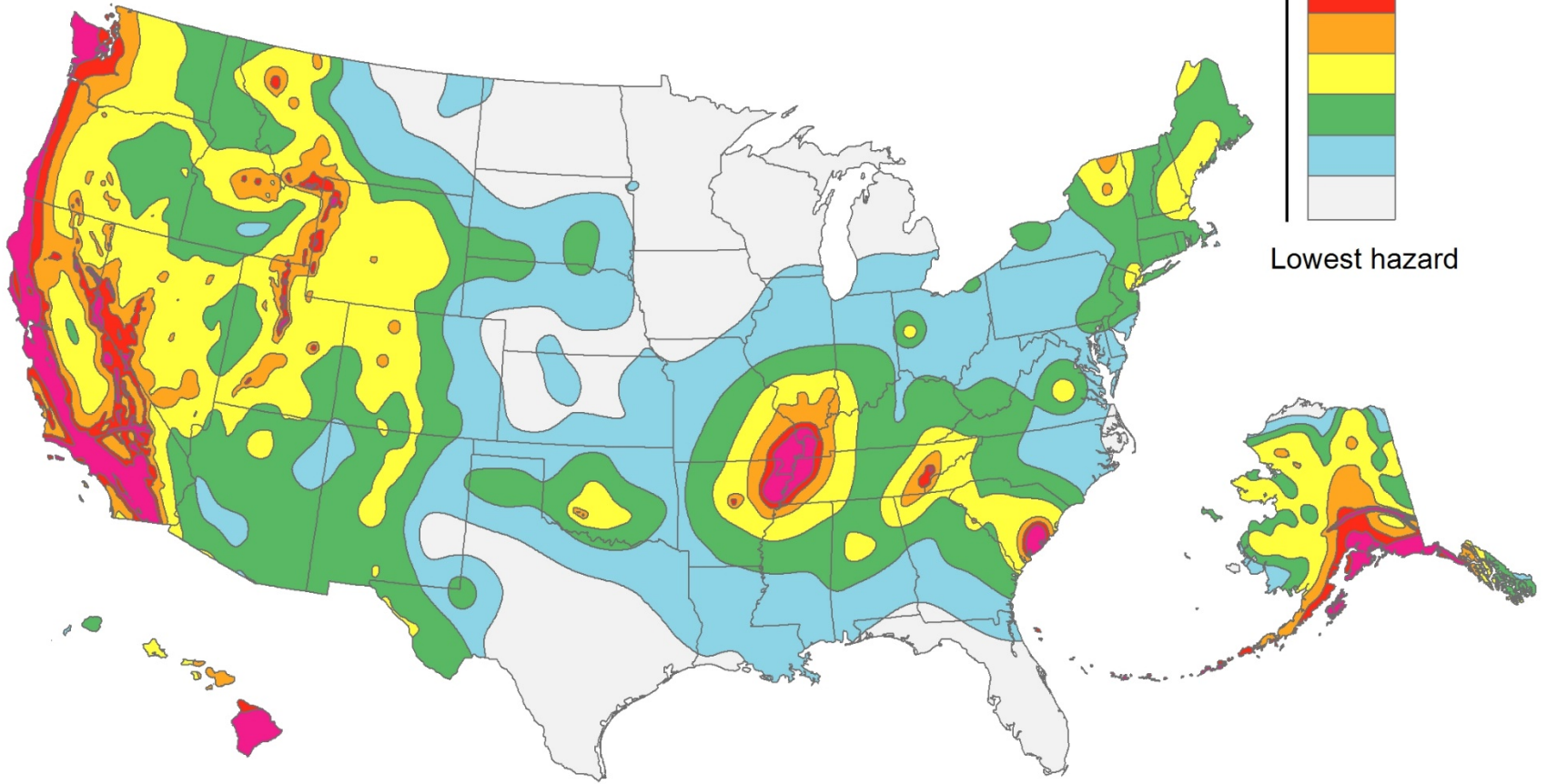
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My House

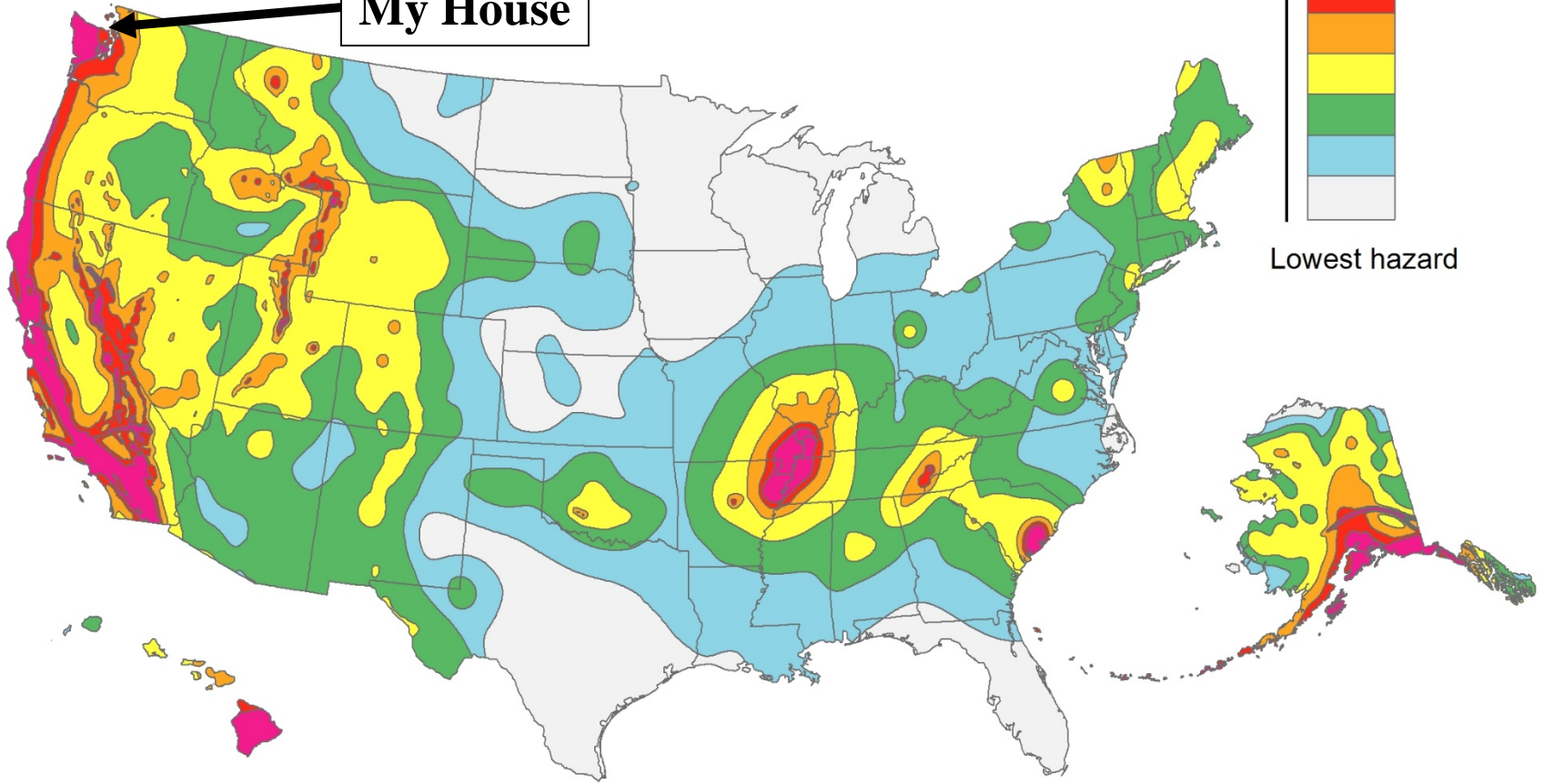


GIS Mapping & Analysis Center
Washington, DC
01/13/14
Sources: ESSR, USGS



Earthquake Hazards

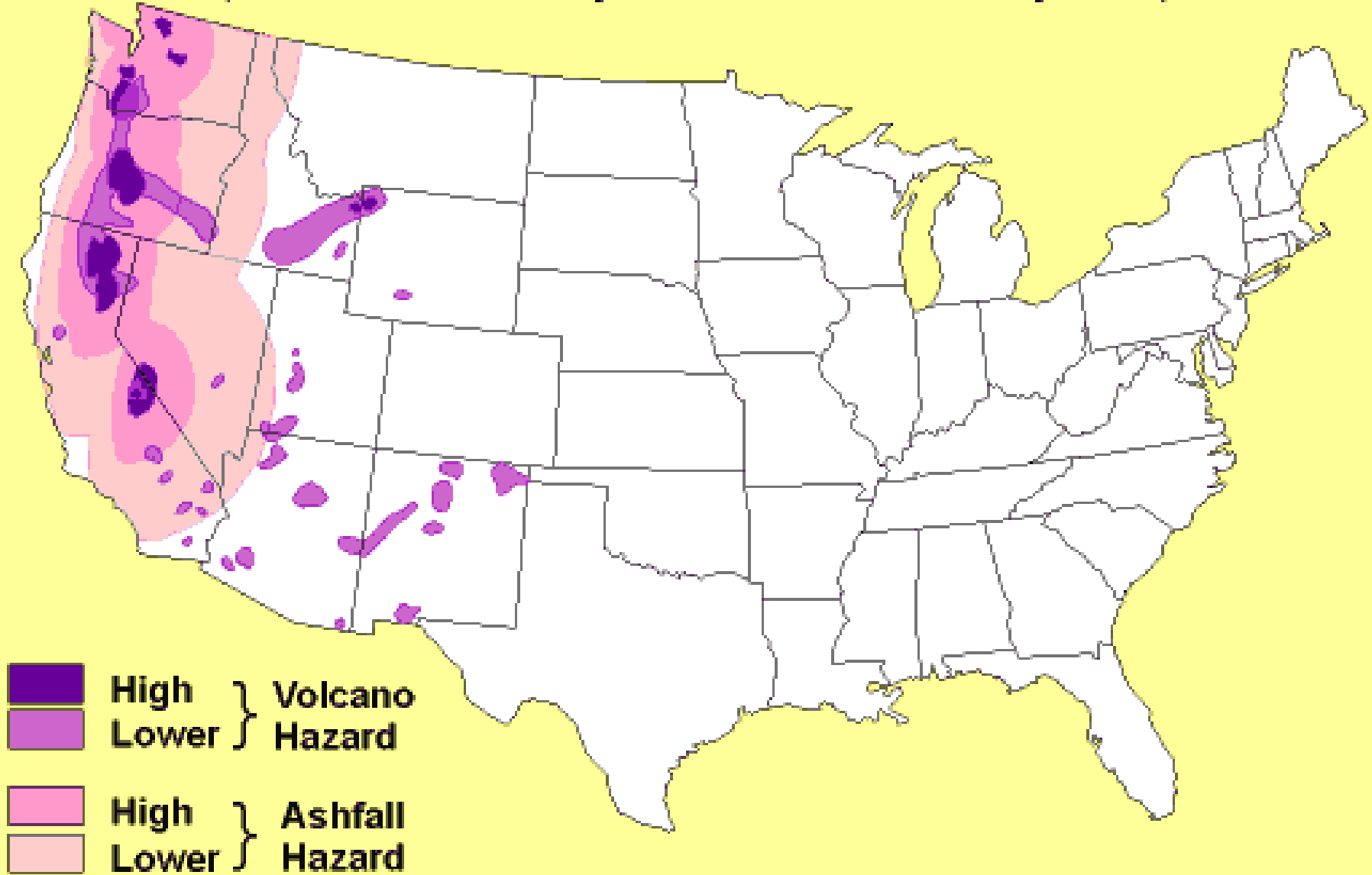
My House



Earthquake Hazards

Volcanic Hazards

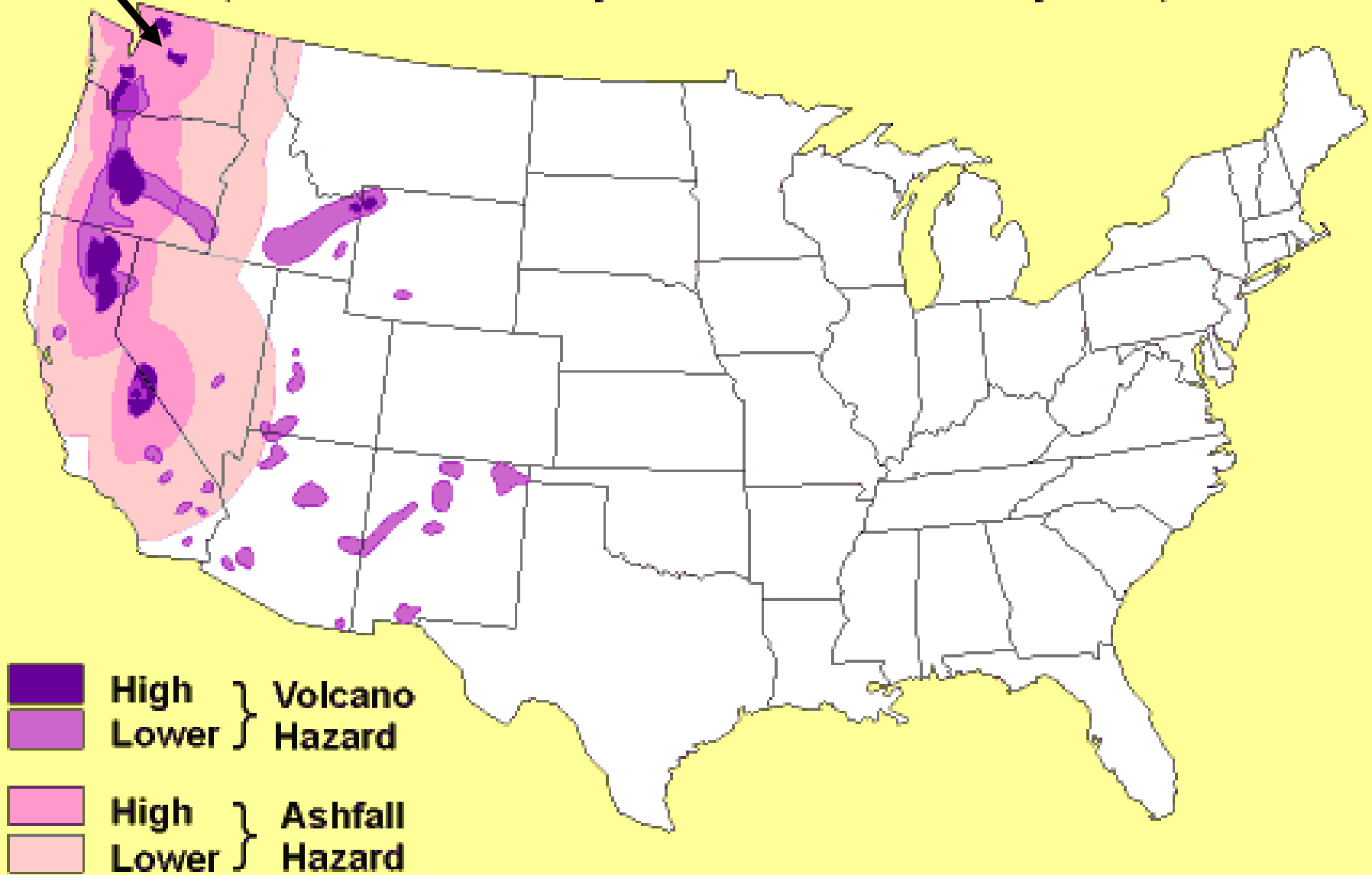
(Based on activity in the last 15,000 years)



My House

Volcanic Hazards

(Based on activity in the last 15,000 years)





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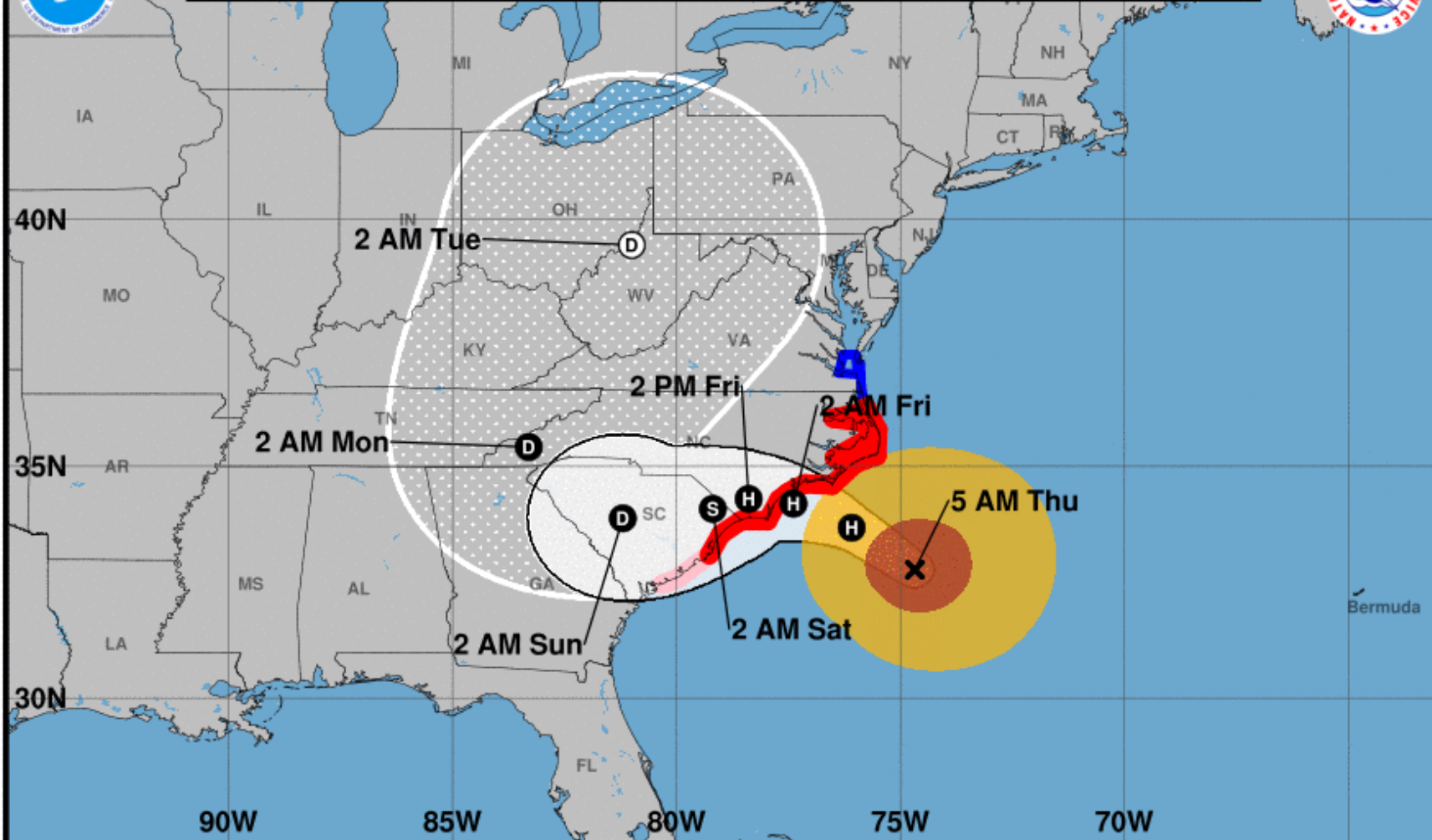








Note: The cone contains the probable path of the storm center but does not show the size of the storm. Hazardous conditions can occur outside of the cone.



Hurricane Florence
 Thursday September 13, 2018
 5 AM EDT Advisory 56
 NWS National Hurricane Center

Current information: x
 Center location 32.8 N 74.7 W
 Maximum sustained wind 110 mph
 Movement NW at 15 mph

Forecast positions:
 ● Tropical Cyclone ○ Post/Potential TC
 Sustained winds: D < 39 mph
 S 39-73 mph H 74-110 mph M > 110 mph

Potential track area:	Watches:	Warnings:	Current wind extent:
Day 1-3 Day 4-5	Hurricane Trop Stm	Hurricane Trop Stm	Hurricane Trop Stm

Appraisals versus Appraisal Reports

Standards of practice

USPAP

A.I. Guide Note 10

Reporting options (narrative, form)

Definition of value – market or something else?

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Appraisals versus Appraisal Reports

Standards of practice

USPAP

A.I. Guide Note 10

“Appraisers need to be sure they have the competency level required to assess damage, if that is what they are being asked to do.”

Stephanie Coleman, MAI, SRA

A.I. Ethics and Standards Counseling

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Appraisal Institute Guide Note 10 –

“...terrorist attacks, natural, and man-made disasters..”

Supply & Demand

*“typical” motivations and “reasonable”
exposure times*

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Appraisal Institute Guide Note 10 –

Market value?

Few, if any, comparable sales

Date of value? (Current? Retrospective?)

Further damage?

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Appraisal Institute Guide Note 10 –

How durable or sustainable is the value?

Communicate the relative reliability of the value determination.

Competency

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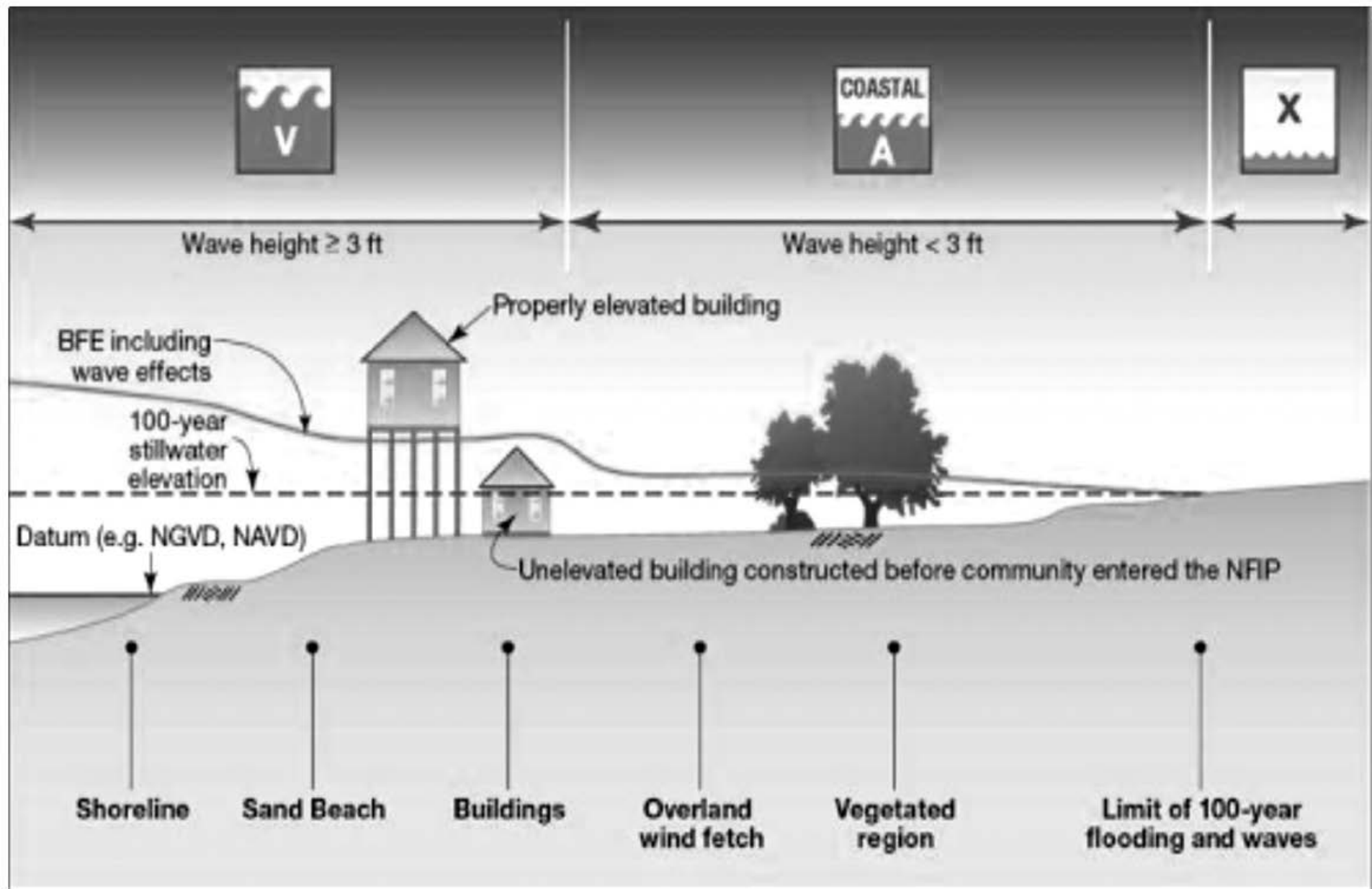
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FEMA Issues

“Market Value” – Substantial Improvement / Substantial Damage Desk Reference

FEMA “50% Rule” → implications for appraisals



Source: FEMA, "Region II Coastal Analysis and Mapping," <http://bit.ly/CoastalMapping>.

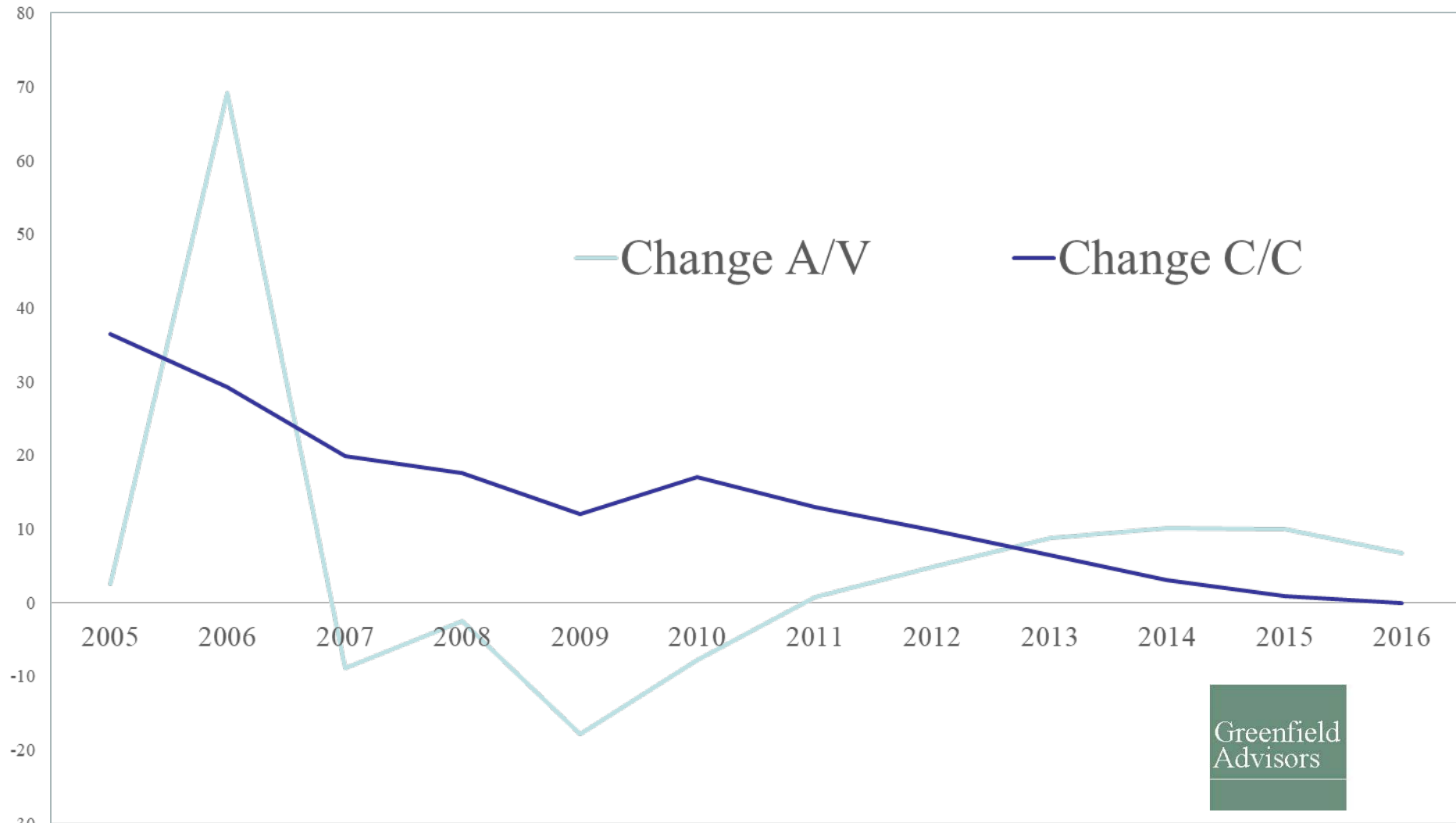
Year	Assessed Value (\$)	Assessed Value (% Change)	Marshall & Swift Construction Cost Index (% Change)
2004	260,000		
2005	266,461	2.49	36.50
2006	450,758	69.16	29.20
2007	410,900	-8.84	19.90
2008	400,592	-2.51	17.60
2009	329,269	-17.80	12.00
2010	303,445	-7.84	17.00
2011	305,764	0.76	13.00
2012	320,640	4.87	9.90
2013	348,765	8.77	6.40
2014	383,876	10.07	3.10
2015	421,998	9.93	0.90
2016	450,500	6.75	0.00

Sources: Assessed value data from www.manateepao.com. Construction Cost Index data from Marshall and Swift Cost Book.

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*Adapted from Staebler, Patricia, "The 50% FEMA Rule Appraisal",
The Appraisal Journal, Fall, 2017, 261-273*

Construction Costs vs Assessed Value

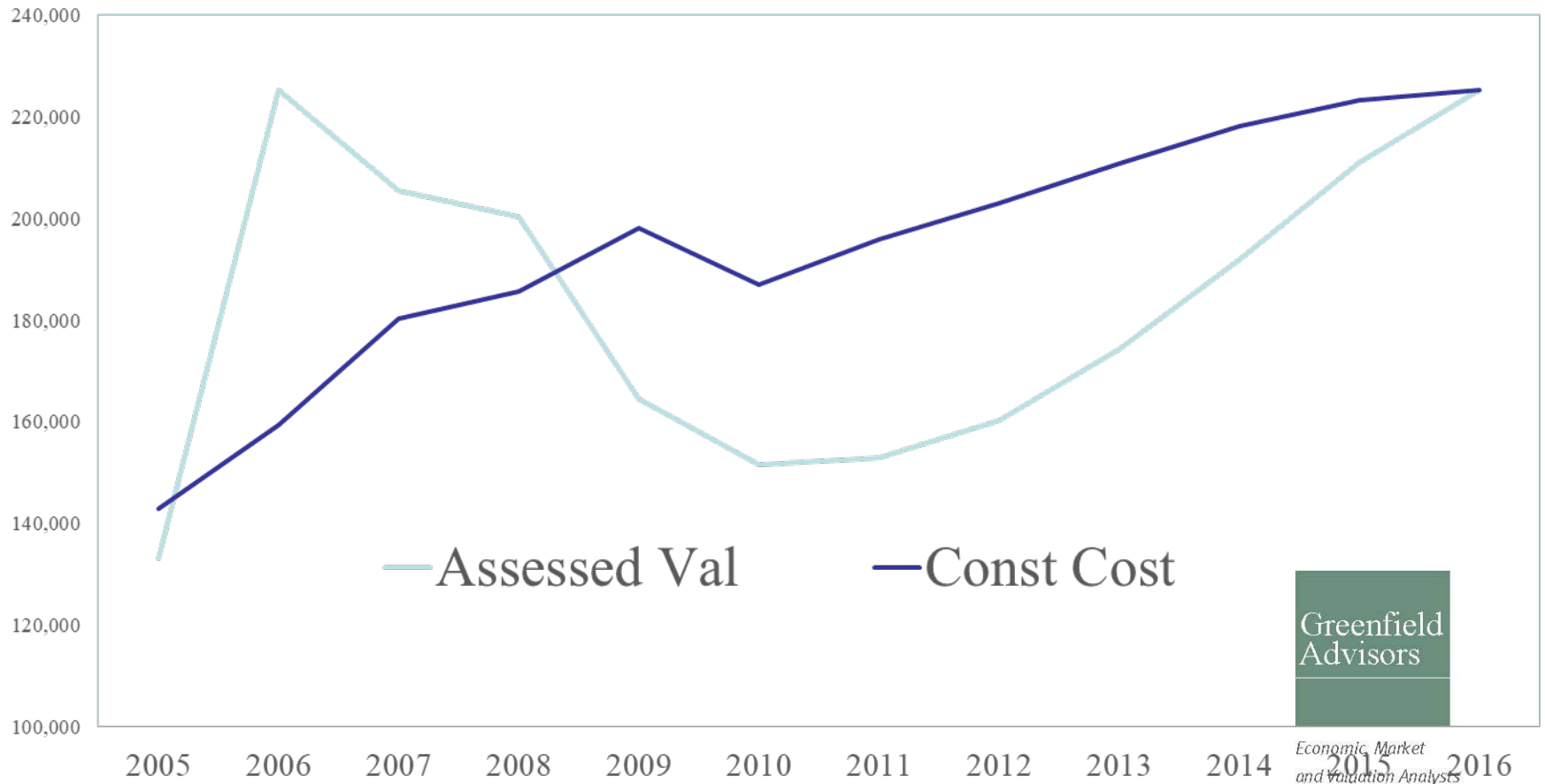


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*Adapted from Staebler, Patricia, "The 50% FEMA Rule Appraisal",
The Appraisal Journal, Fall, 2017, 261-273*

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The Appraisal Journal, Fall, 2017, 261-273*

FEMA 50% Allowance \$260,000 A/V in 2004



IRS Considerations

...the amount of the casualty loss deduction ...lesser of the decrease in the FMV of the property or the property's adjusted basis for tax purposes.

...if the property is used in a trade or business and is totally destroyed by the casualty, the loss is equal to adjusted basis of the property....generally its original cost, plus capital improvements, minus accumulated depreciation.

....an appraisal is necessary to substantiate the decline in the FMV of the property...IRC § 165(i)(4) indicates that “an appraisal for the purpose of obtaining a loan of Federal funds or a loan guarantee from the Federal Government as a result of a federally declared disaster...may be used to establish [i.e., substantiate] the amount of any loss” for a casualty loss deduction.

Adapted from Smith, Kames K, and Barbara Lougee, “The Appraiser’s Role in Calculating Casualty Loss Deductions from Natural Disasters”, The Appraisal Journal, Winter, 2014, 27-36



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Dr. John Kilpatrick is an economist and real estate appraiser, and the Co-Managing Partner of Greenfield Advisors, specializing in economic market and valuation analysis, principally in real estate matters, headquartered in Seattle. He also represents the citizens of Western Washington as a Director of the Washington State Economic Development Finance Authority. From 2009 until 2015, he was a Visiting Scholar in Real Estate Finance at the Zicklin School of Business, Baruch College, New York City.

Dr. Kilpatrick holds a Ph.D. in Finance from the University of South Carolina, where he also taught Real Estate and Corporate Finance in the Moore School of Business. He served as the founding Administrator of the South Carolina Supercomputer Network and as the Secretary/Treasurer of the Academic Coalition for Intelligent Manufacturing Systems, based in Washington, DC.

Dr. Kilpatrick is the author of four books and numerous journal articles. He is a frequent speaker before national groups, including the U.S. Senate Subcommittee on Science, Technology, and Space and the National Trust for Historic Preservation. His work in real estate finance has been the subject of recent articles in the New York Times, the Boston Globe, and the Wall Street Journal. He is the co-author of “Brownfield Valuation” in the Lexis-Nexis Matthew Bender’s Brownfield Law and Practice and “Valuation in the ABA’s Brownfields 3rd ed. In 2001, the National Park Service honored Dr. Kilpatrick by producing a monograph summarizing his work in the valuation of historic neighborhoods.

His recent clients include the U.S. General Services Administration, the Hearst Family, the Japan Real Estate Institute, and numerous private investors, corporations, university endowments, trusts, and law firms.

The logo for Greenfield Advisors consists of a dark green square with the words "Greenfield Advisors" in white serif font. The word "Greenfield" is on the top line and "Advisors" is on the bottom line.

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