January 2015

The Economic Importance of Texas' Coastal Counties:
An Analysis of the Dependence of Texas and its Regions on Business Operations in the Tier 1 Windstorm Insurance Coverage Area

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Introduction

The counties along the Texas Gulf Coast account for more than a third of Texas economic activity as measured by output (real gross product). Moreover, business operations in the area are vital to other regions, providing input goods and services and access points to world markets.

In particular, refineries in the area supply fuel for individuals and businesses across the state and beyond. Petrochemicals products produced along the coast are used extensively in every portion of Texas and are crucial to numerous industries. The coastal ports are essential to export production sectors across the state as well as businesses relying on imported goods. Because of the current development of several liquefied natural gas (LNG) export facilities in the area which will support mineral production in other parts of the state, these effects will likely magnify over time. In short, every region of the state is economically dependent on the coastal counties and the degree of integration is expected to increase in the future.

> More than 33% of Texas economic activity takes place in counties along the Texas Gulf Coast.

The Perryman Group (TPG) was recently asked to examine the importance of coastal areas to overall state business activity. This report presents the results of this assessment.

Study Overview and Summary of Methods Used

The study area for this analysis is the region defined by the Texas Department of Insurance as the Tier 1 Windstorm Coverage Area, which includes Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kenedy, Kleberg, Matagorda, Nueces, Refugio, San Patricio, and Willacy counties as well as portions of Harris County (which was included in this assessment in its entirety given data limitations at the sub-county level and the location of key production facilities and resources).

The Perryman Group compiled economic data regarding the Tier 1 area in order to assess its importance to the state economy. In addition, linkages between economic activity in this area and other parts of the state were explored in order to determine the portion of business activity in each region which is dependent on the Tier 1 area. Finally, TPG quantified the likely

reduction in business activity in each region of the state in the event of a storm in the Tier 1 area of various strengths. The methods used and assumptions are described in more detail in the Appendices to this report.

Highlights of Study Findings

- The **counties along the Texas Gulf Coast (including Harris County) comprise a significant proportion of overall business activity**. The Perryman Group estimates that the area accounts for
    - some **33.4%** of total Texas real gross product (measured as of 2014),
    - more than **23.5%** of Texas' population, and
    - **25.0%** of total Texas jobs (26.3% by the wage and salary employment measure).

- The Tier 1 Windstorm Coverage Area is **forecast to see healthy and sustainable economic growth through 2040**, with
    - real gross product projected to expand from $497.4 billion to nearly $1.2 trillion (a 3.35% compound annual rate of growth) and
    - employment forecast to rise by more than 1.6 million to reach 4.8 million in 2040.

- There are **several regions in which well over 40% of employment depends on sectors in counties along the Texas Gulf Coast**. While some are located near the area, others are hundreds of miles away. **At least 25% of gross product in each region** is directly dependent on sectors in the Texas Gulf Coast counties, with some as high as 60% or more. A substantial portion of personal income in each region is also directly dependent on sectors in the Tier 1 area.

- The Perryman Group also measured the potential consequences in each region to significant disruptions stemming from storms in the Tier 1 area. The results at the state level are summarized below.

Overall Economic Activity Directly Vulnerable to Significant Disruptions in the Event of a Storm in the Tier 1 Windstorm Insurance Coverage Area						
	GROSS PRODUCT		PERSONAL INCOME		EMPLOYMENT	
	(Billions of 2009$)	% of Total	(Billions of 2009$)	% of Total		% of Total
Rita Level Storm	$10.732	0.72%	$6.408	0.74%	70,736	0.59%
Ike Level Storm	$21.955	1.48%	$13.110	1.51%	144,709	1.21%
Katrina Level Storm	$78.386	5.27%	$46.805	5.40%	516,650	4.31%
Note: Assumes that damage occurs in a "typical" segment of the Tier 1 area and that all direct rate increases are being borne locally (thus increasing risks and reducing coverage). Source: The Perryman Group						

- The core export sectors in the Tier 1 Windstorm Coverage Area affect communities across Texas, and rational and affordable approaches to risk management will likely require a state-level commitment

# Importance of the Tier 1 Area to the State Economy

The counties along the Texas Gulf Coast (including Harris County) comprise a significant proportion of overall business activity. The Perryman Group estimates that the area accounts for some **33.4% of total Texas real gross product** (measured as of 2014), and more than 23.5% of Texas' population resides in the area.

The area is also crucial to employment, with **25.0% of total Texas jobs** (26.3% by the wage and salary employment measure). The coastal counties of the Tier 1 Windstorm Insurance coverage area also comprise significant portions of real personal income, with almost 26.6% by place of residence (31.6% by place of work).

Clearly, these counties are highly important to the overall Texas economy, as illustrated in the accompanying table and graphs.

Percentage of the Texas Economy Represented by Counties in the Tier 1 Windstorm Insurance Area	
Real Gross Product (RGP)	33.43%
Real Personal Income (RPI) by Place of Residence	26.57%
Real Personal Income (RPI) by Place of Work	31.60%
Total Employment	25.04%
Wage and Salary Employment	26.27%
Population	23.52%
Real Retail Sales	26.42%
SOURCE: The Perryman Group	

The Economic Importance of Texas' Coastal Counties:

An Analysis of the Dependence of Texas and its Regions on Business Operations in the Tier 1 Windstorm Insurance Coverage Area

Percentage of Texas Wage and Salary Employment Represented by Counties in the Tier 1 Windstorm Insurance Area

Tier 1 Area
26.27%

Rest of Texas
73.73%
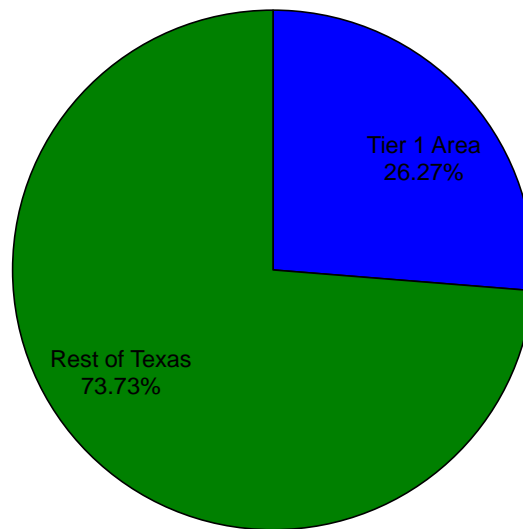
Source: The Perryman Group

Percentage of Texas Real Gross Product Represented by Counties in the Tier 1 Windstorm Insurance Area

Tier 1 Area
33.43%

Rest of Texas
66.57%
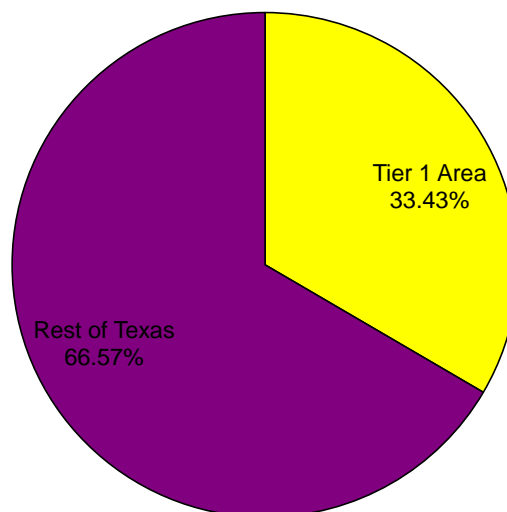
Source: The Perryman Group

Economic Forecast for the Tier 1 Area

According to The Perryman Group's forecasts, the Tier 1 Windstorm Coverage Area is forecast to see healthy and sustainable economic growth in the decades to come. Through 2040, real gross product is projected to expand from $497.4 billion to nearly $1.2 trillion, a 3.35% compound annual rate of growth. Employment in the region is forecast to rise by more than 1.6 million, to reach 4.8 million in 2040 (a 1.62% compound annual rate of expansion).

Outlook for the Counties in the Tier 1 Windstorm Insurance Coverage Area Economic Indicators 2014 - 2040				
Key Indicator	**2014 Level**	**Projected 2040 Level**	**Projected Growth Rate***	**Projected Increase**
Real Gross Product*	$497.389 billion	$1.170 trillion	3.35%	$673.032 billion
Population	6.366 million	9.632 million	1.61%	3.266 million
Wage & Salary Employment	3.149 million	4.783 million	1.62%	1.634 million
Real Personal Income*	$298.779 billion	$814.147 billion	3.93%	$515.368 billion
Real Retail Sales*	$107.911 billion	$289.257 billion	3.87%	$181.347 billion

*Compound Annual Growth Rate, meaning that it reflects changes in the base from which growth is calculated. Real Gross Product and Real Retail Sales are computed in 2009 dollars. Real Personal Income by place of residence, in 2009 dollars.

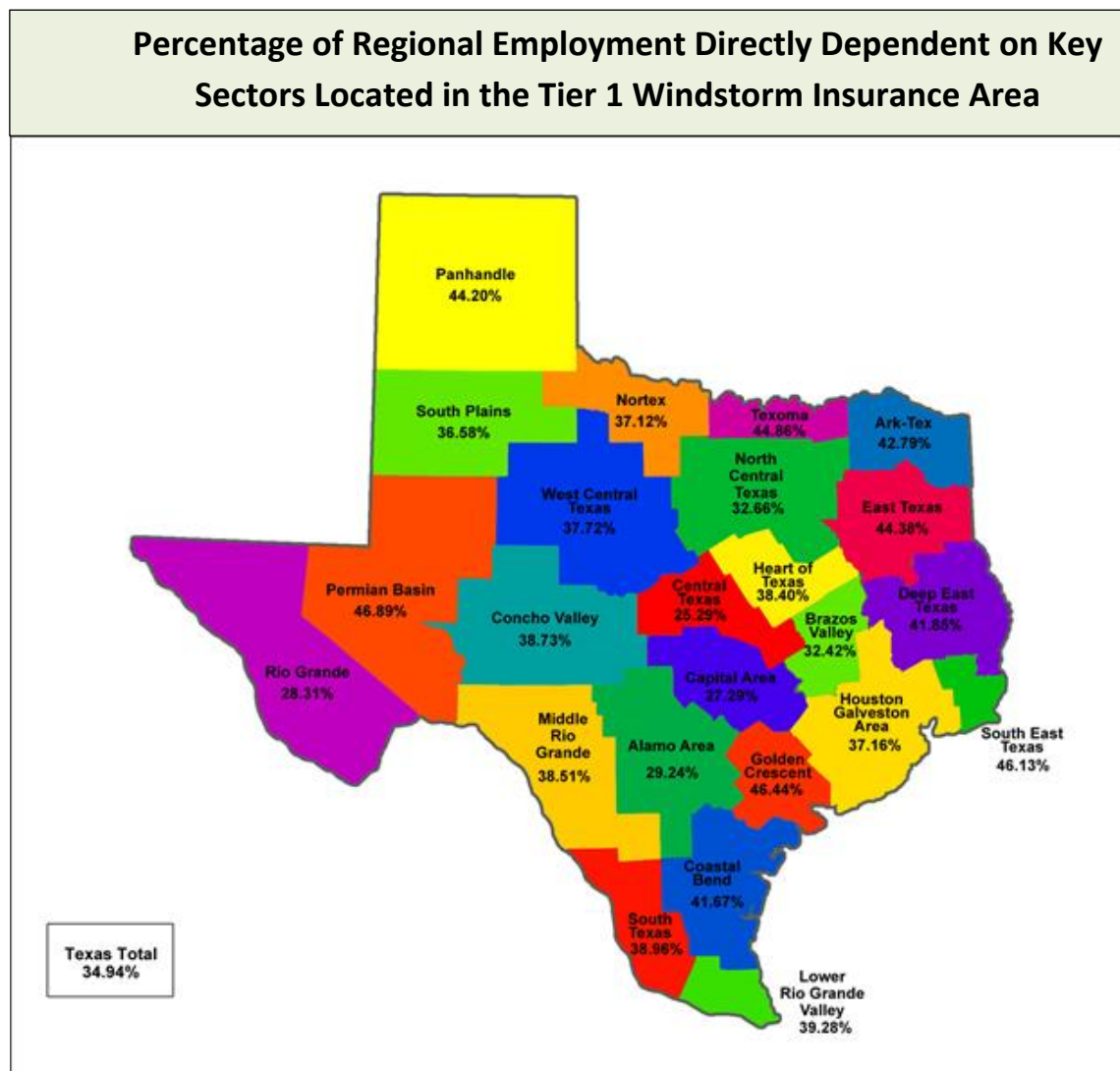# Regional Economic Dependency on the Tier 1 Area

In addition to comprising a large segment of the overall Texas economy, business operations within the coastal counties of the Tier 1 area are crucial to the economies of other regions of the state.

The Perryman Group estimated the proportion of each region's economy dependent on the Tier 1 area by a multi-stage process. Initially, the requirements coefficients from the US Multi-Regional Impact Assessment System (USMRIAS) were used to determine which sectors of the economy were highly dependent on the key export-oriented sectors discussed previously (refining (including the potential for LNG), petrochemicals, and ports and water transportation). The concentrations of the relevant industries needing these resources associated with the Tier 1 area were then determined for each of the 24 Council of Governments (COG) planning regions in Texas using the regional level gross product data maintained by The Perryman Group.

Finally, the portion of each region's needs acquired from the Tier 1 area was projected using gravity modeling, a well-established technique for allocating production across regions, as well as the interregional parameters of the USMRIAS. Note that the resulting measures constitute the segment of the economy in each region that is dependent on the key export sectors of the Tier 1 area. If these resources were not readily available, all of the collateral production and employment would not disappear. It would, however, lead to (1) notable short-term disruptions in the portion of each region identified and (2) long-term adjustments which would likely result in both higher input costs and greater risk and vulnerability.

Employment

For employment, there are several regions in which well over 40% of employment depends on sectors in counties along the Texas Gulf Coast. While some are located near the area, others are hundreds of miles away such as the Panhandle and Permian Basin. Regional employment dependencies include an estimated 1,110,909 in North Central Texas, some 302,905 in the Alamo Area, 267,101 in the Capital Area, and 159,743 in the Lower Rio Grande Valley. (See the Appendices for results for each region.)

Percentage of Regional Employment Directly Dependent on Key Sectors Located in the Tier 1 Windstorm Insurance Area

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Gross Product

At least 25% of gross product in each region is directly dependent on sectors in the Texas Gulf Coast counties, with some as high as 60% or more. For the North Central Texas area, some $164.5 billion in gross product is directly dependent on industries in the Tier 1 area. Dependencies for other areas include $34.8 billion in the Capital area, $29.8 billion in the Alamo area, and $26.3 billion in the Permian Basin.

Percentage of Regional Gross Product Directly Dependent on Key Sectors Located in the Tier 1 Windstorm Insurance Area
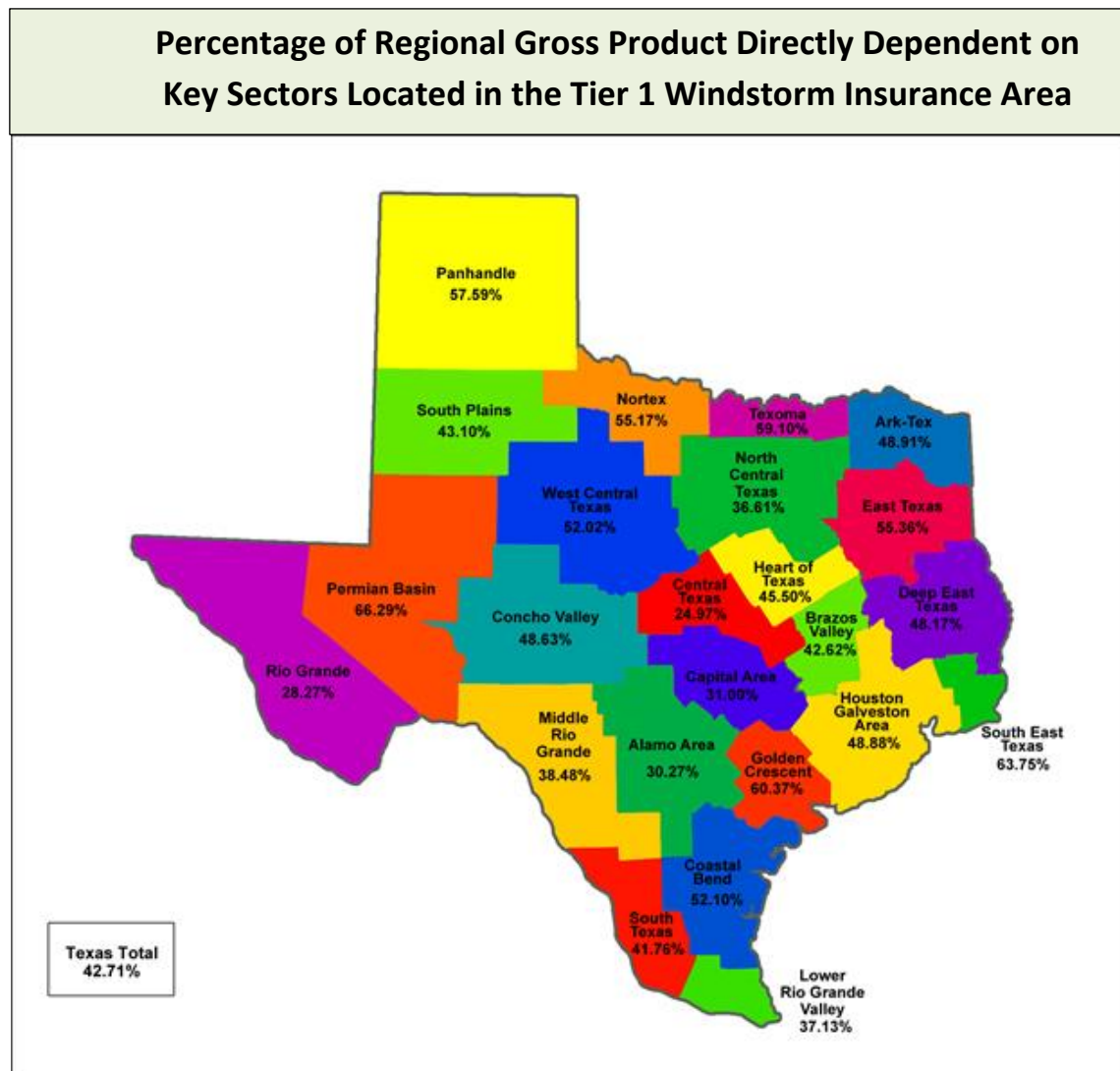
Personal Income

A substantial portion of personal income in each region is also directly dependent on sectors in the Tier 1 area. Estimated personal income of $101.2 billion in the North Central area, $21.3 billion in the Alamo area, $21.6 billion in the Capital area, and $11.7 billion in the East Texas area is dependent on the Tier 1 area.

Percentage of Regional Personal Income Directly Dependent on Key Sectors Located in the Tier 1 Windstorm Insurance Area

Panhandle 58.19%
South Plains 46.88%
Nortex 54.19%
Texoma 57.88%
Ark-Tex 49.50%
North Central Texas 39.25%
East Texas 56.49%
West Central Texas 52.16%
Heart of Texas 45.65%
Permian Basin 66.20%
Central Texas 26.88%
Deep East Texas 51.61%
Concho Valley 49.93%
Brazos Valley 42.44%
Rio Grande 31.92%
Capital Area 32.61%
Houston Galveston Area 49.01%
Middle Rio Grande 39.93%
Alamo Area 33.29%
Golden Crescent 56.71%
South East Texas 57.60%
Coastal Bend 53.37%
South Texas 43.68%
Lower Rio Grande Valley 42.57%

Texas Total 43.79%

Vulnerability to Storms in the Tier 1 Area

The Perryman Group also measured the potential consequences in each region to significant disruptions stemming from storms in the Tier 1 area. For purposes of illustration, the extent of vulnerability was quantified on a regional basis assuming a storm with the magnitude of economic harm and displacement of each of the three hurricanes, Rita, Ike, and Katrina, that have occurred along the Gulf Coast in recent years (Katrina did not directly impact Texas, but was included as a "worst case" scenario due to its magnitude).

- Hurricane Rita made landfall in southwestern Louisiana between Sabine Pass, Texas and Johnson's Bayou, September 24, 2005 as a Category 3 (winds between 111 and 129 mph) hurricane.
- Hurricane Ike made landfall Saturday, September 13, 2008 near Galveston, Texas. Ike was a Category 2 hurricane at landfall with maximum sustained winds of 110 mph, and produced a destructive storm surge and major flooding across the upper Texas and southwest Louisiana coasts.
- Hurricane Katrina made landfall in southeast Louisiana August 29, 2005 as a large Category 4 hurricane with sustained winds of about 145 mph. Katrina is one of the worst natural disasters in US history, causing major flooding as well as wind damage.

For a storm of Hurricane Rita's intensity, overall economic activity subject to disruptions in the state includes an estimated $10.7 billion in gross product, with negative fallout in every region. An Ike-level storm would involve an estimated $22.0 billion in gross product at risk, and one of Katrina's magnitude would lead to vulnerability of some $78.4 billion in output for the state.

The results at the state level are summarized below. Note that these effects reflect conditions in which all incremental storm insurance costs are borne within the Tier 1 area, thus resulting in reduced coverage and increased risks.

Overall Economic Activity Directly Vulnerable to Significant Disruptions in the Event of a Storm in the Tier 1 Windstorm Insurance Coverage Area						
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	(Billions of 2009$)	% of Total	(Billions of 2009$)	% of Total		% of Total
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In each region, gross product, income, and employment would be negatively affected. For a mid-intensity storm such as Ike, for example, the Panhandle Region could be expected to see industries in the area face vulnerabilities of $408.8 million in gross product, or 1.99% of the current total in the region. Such a storm has the potential to put at risk gross product in North Central Texas of some $5.7 billion, or 1.26% of the current total in that region.

A table of the vulnerability by region to each intensity level of storm may be found in the Appendices.

Conclusion

The coastal counties of Texas, which comprise the Tier 1 Windstorm Coverage Area, are important centers for several industries essential to the economic vitality of all parts of the state. Linkages between business operations in communities in all regions of Texas and the Gulf Coast counties are strong, and disruptions due to storms result in economic fallout across the state.

The Perryman Group found that approximately one third of total state real gross product and one fourth of jobs fall within the coastal counties (including Harris County). Regions far removed geographically depend on the industries centered along the coast, and a storm has the potential to disrupt business activity throughout the state.

If businesses along the coast are threatened by issues such as insurance-related difficulties, the entire state feels the effects. To the extent that excessively high premiums lead to underinsurance, for instance, all of Texas is more vulnerable to negative economic effects of a catastrophic storm.

The bottom line is that the core export sectors in the Tier 1 Windstorm Coverage Area affect communities across Texas, and rational and affordable approaches to risk management will likely require a state-level commitment.

APPENDICES

APPENDIX A: About The Perryman Group

The Perryman Group is an economic research and analysis firm based in Waco, Texas. The firm has more than 30 years of experience in assessing the economic impact of corporate expansions, regulatory changes, real estate developments, public policy initiatives, and myriad other factors affecting business activity. Impact studies have been performed for hundreds of clients including many of the largest corporations in the world, governmental entities at all levels, educational institutions, major health care systems, utilities, and economic development organizations.

Dr. M. Ray Perryman, founder and President of the firm, developed the US Multi-Regional Impact Assessment System (used in this study) in the early 1980s and has consistently maintained, expanded, and updated it since that time. The model has been used in hundreds of diverse applications and has an excellent reputation for reliability.

The firm has conducted numerous investigations related to the economic interdependencies of various regions of Texas and has a long history of analyzing the economies of all Gulf Coast Region metropolitan areas as well as the surrounding region. TPG has performed major studies relating to property and casualty insurance patterns and similar issues, including prior assessments of the economics of windstorm insurance on multiple prior occasions.

APPENDIX B: Methods Used

US Multi-Regional Impact Assessment System

Although the nature of the calculations in this analysis did not require full-scale simulations of an impact assessment system, the relevant model was used extensively in the calculations and is thus described for purposes of completeness. The basic modeling technique typically employed in impact studies is known as dynamic input-output analysis. This methodology essentially uses extensive survey data, industry information, and a variety of corroborative source materials to create a matrix describing the various goods and services (known as resources or inputs) required to produce one unit (a dollar's worth) of output for a given sector. Once the base information is compiled, it can be mathematically simulated to generate evaluations of the magnitude of successive rounds of activity involved in the overall production process. The present study makes use of the US Multi-Regional Impact Assessment System (USMRIAS) which was developed and is maintained by The Perryman Group.

There are two essential steps in conducting a standard input-output analysis once the system is operational. The first major endeavor is to accurately define the levels of direct activity to be evaluated. In the case of a prospective evaluation, it is necessary to first calculate reasonable estimates of the direct activity. As noted and described in more detail in the report, this investigation made extensive use of the relevant coefficients to identify the key industries that were dependent on the core export sectors from the Tier 1 area, as well as the interactions of the various regions. The remainder of the analysis required the use of an econometric model and data base, which is subsequently described.

The second major phase of a traditional impact assessment is the simulation of the input-output system to measure overall economic effects of these incremental outlays. The process is outlined briefly below. This USMRIAS has been used in hundreds of diverse applications across the country and has an excellent reputation for accuracy and credibility. The coefficients of the systems used in the current simulation reflect the unique industrial structure and characteristics of the economy of Texas and each of the regions analyzed.

The USMRIAS is somewhat similar in format to the Input-Output Model of the United States and the Regional Input-Output Modeling System, both of which are maintained by the US Department of Commerce. The model developed by TPG, however, incorporates several important enhancements and refinements. Specifically, the expanded system includes (1) comprehensive 500-sector coverage for any county, multi-county, or urban region; (2) calculation of both total expenditures and value-added by industry and region; (3) direct estimation of expenditures for multiple basic input choices (expenditures, output, income, or employment); (4) extensive parameter localization; (5) price adjustments for real and nominal

assessments by sectors and areas; (6) measurement of the induced impacts associated with payrolls and consumer spending; (7) embedded modules to estimate multi-sectoral direct spending effects; (8) estimation of retail spending activity by consumers; and (9) comprehensive linkage and integration capabilities with a wide variety of econometric, real estate, occupational, and fiscal impact models. Moreover, the model uses specific local taxing patterns to estimate the fiscal effects of activity on a detailed sectoral basis. The models used for the present investigation have been thoroughly tested for reasonableness and historical reliability.

The impact assessment (input-output) process essentially estimates the amounts of all types of goods and services required to produce one unit (a dollar's worth) of a specific type of output. For purposes of illustrating the nature of the system, it is useful to think of inputs and outputs in dollar (rather than physical) terms. As an example, the construction of a new building will require specific dollar amounts of lumber, glass, concrete, hand tools, architectural services, interior design services, paint, plumbing, and numerous other elements. Each of these suppliers must, in turn, purchase additional dollar amounts of inputs. This process continues through multiple rounds of production, thus generating subsequent increments to business activity. The initial process of building the facility is known as the *direct effect*. The ensuing transactions in the output chain constitute the *indirect effect*.

Another pattern that arises in response to any direct economic stimulus (whether positive or negative) comes from the payroll dollars received/lost by employees at each stage of the production cycle. As workers are compensated, they use some of their income for taxes, savings, and purchases from external markets. A substantial portion, however, is spent locally on food, clothing, health care services, utilities, housing, recreation, and other items. Typical purchasing patterns in the relevant areas are obtained from the *ACCRA Cost of Living Index*, a privately compiled inter-regional measure which has been widely used for several decades, and the *Consumer Expenditure Survey* of the US Department of Labor. These initial outlays by area residents generate further secondary activity as local providers acquire inputs to meet this consumer demand. These consumer spending impacts are known as the *induced effect*. The USMRIAS is designed to provide realistic, yet conservative, estimates of these phenomena.

Sources for information used in this process include the Bureau of the Census, the Bureau of Labor Statistics, the Regional Economic Information System of the US Department of Commerce, and other public and private sources. The pricing data are compiled from the US Department of Labor and the US Department of Commerce. The verification and testing procedures make use of extensive public and private sources.

Impacts were measured in constant 2014 dollars to eliminate the effects of inflation.

The USMRIAS generates estimates of the effect on several measures of business activity. The most comprehensive measure of economic activity used in this study is **Total Expenditures**. This measure incorporates every dollar that changes hands in any transaction. For example, suppose a farmer sells wheat to a miller for $0.50; the miller then sells flour to a baker for $0.75; the baker, in turn, sells bread to a customer for $1.25. The Total Expenditures recorded in this instance would be $2.50, that is, $0.50 + $0.75 + $1.25. This measure is quite broad, but is useful in that (1) it reflects the overall interplay of all industries in the economy, and (2) some key fiscal variables such as sales taxes are linked to aggregate spending.

A second measure of business activity frequently employed in this analysis is that of **Gross Product**. This indicator represents the regional equivalent of Gross Domestic Product, the most commonly reported statistic regarding national economic performance. In other words, the Gross Product of Arkansas is the amount of US output that is produced in that state; it is defined as the value of all final goods produced in a given region for a specific period of time. Stated differently, it captures the amount of value-added (gross area product) over intermediate goods and services at each stage of the production process, that is, it eliminates the double counting in the Total Expenditures concept. Using the example above, the Gross Product is $1.25 (the value of the bread) rather than $2.50. Alternatively, it may be viewed as the sum of the value-added by the farmer, $0.50; the miller, $0.25 ($0.75 - $0.50); and the baker, $0.50 ($1.25 - $0.75). The total value-added is, therefore, $1.25, which is equivalent to the final value of the bread. In many industries, the primary component of value-added is the wage and salary payments to employees.

The third gauge of economic activity used in this evaluation is **Personal Income**. As the name implies, Personal Income is simply the income received by individuals, whether in the form of wages, salaries, interest, dividends, proprietors' profits, or other sources. It may thus be viewed as the segment of overall impacts which flows directly to the citizenry.

The fourth measure, **Retail Sales**, represents the component of Total Expenditures which occurs in retail outlets (general merchandise stores, automobile dealers and service stations, building materials stores, food stores, drugstores, restaurants, and so forth). Retail Sales is a commonly used measure of consumer activity.

The final aggregates used are **Permanent Jobs and Person-Years of Employment**. The Person-Years of Employment measure reveals the full-time equivalent jobs generated by an activity. It should be noted that, unlike the dollar values described above, Permanent Jobs is a "stock" rather than a "flow." In other words, if an area produces $1 million in output in 2010 and $1 million in 2011, it is appropriate to say that $2 million was achieved in the 2010-2011 period. If the same area has 100 people working in 2010 and 100 in 2011, it only has 100 Permanent

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Jobs. When a flow of jobs is measured, such as in a construction project or a cumulative assessment over multiple years, it is appropriate to measure employment in Person-Years (a person working for a year). This concept is distinct from Permanent Jobs, which anticipates that the relevant positions will be maintained on a continuing basis.

Texas Econometric Model

The Texas Econometric Model was used in deriving baseline projections for economic activity in the Tier 1 area, as well as in the determination of the vulnerabilities in the various regions. This Model is formulated in an internally consistent manner and is designed to permit the integration of relevant global, national, state, and local factors into the projection process. They are the result of more than 30 years of continuing research in econometrics, economic theory, statistical methods, and key policy issues and behavioral patterns, as well as intensive, ongoing study of all aspects of the global, US, and Texas economies.

The remainder of this Technical Explanation describes the forecasting process in a comprehensive manner, focusing on both the modeling and the supplemental analysis. The overall methodology, while certainly not ensuring perfect foresight, permits an enormous body of relevant information to impact the economic outlook in a systematic manner.

Model Logic and Structure

The expanded version of the Texas Econometric Model, developed and maintained by The Perryman Group, revolves around a core system which projects output, income, and employment by industry in a simultaneous manner. For purposes of illustration, it is useful to initially consider the employment functions. Essentially, employment within the system is a derived demand relationship obtained from a neo-Classical production function. The expressions are augmented to include dynamic temporal adjustments to changes in relative factor input costs, output and (implicitly) productivity, and technological progress over time. Thus, the typical equation includes output, the relative real cost of labor and capital, dynamic lag structures, and a technological adjustment parameter. The functional form is logarithmic, thus preserving the theoretical consistency with the neo-Classical formulation.

The income segment of the model is divided into wage and non-wage components. The wage equations, like their employment counterparts, are individually estimated at the three-digit North American Industry Classification System (NAICS) level of aggregation. Hence, income by place of work is measured for approximately 70 distinct production categories. The wage equations measure real compensation, with the form of the variable structure differing between "basic" and "non-basic."

The basic industries, comprised primarily of the various components of Mining, Agriculture, and Manufacturing, are export-oriented, i.e., they bring external dollars into the area and form the core of the economy. The production of these sectors typically flows into national and international markets; hence, the labor markets are influenced by conditions in areas beyond the borders of the particular region. Thus, real (inflation-adjusted) wages in the basic industry are expressed as a function of the corresponding national rates, as well as measures of local labor market conditions (the reciprocal of the unemployment rate), dynamic adjustment parameters, and ongoing trends.

The "non-basic" sectors are somewhat different in nature, as the strength of their labor markets is linked to the health of the local export sectors. Consequently, wages in these industries are related to those in the basic segment of the economy. The relationship also includes the local labor market measures contained in the basic wage equations.

Note that compensation rates in the export or basic sectors provide a key element of the interaction of the regional economies with national and international market phenomena, while the "non-basic" or local industries are strongly impacted by area production levels. Given the wage and employment equations, multiplicative identities in each industry provide expressions for total compensation; these totals may then be aggregated to determine aggregate wage and salary income. Simple linkage equations are then estimated for the calculation of personal income by place of work.

The non-labor aspects of personal income are modeled at the regional level using straightforward empirical expressions relating to national performance, dynamic responses, and evolving temporal patterns. In some instances (such as dividends, rents, and others) national variables (for example, interest rates) directly enter the forecasting system. These factors have numerous other implicit linkages into the system resulting from their simultaneous interaction with other phenomena in national and international markets which are explicitly included in various expressions.

The output or gross area product expressions are also developed at the three-digit NAICS level. Regional output for basic industries is linked to national performance in the relevant industries, local and national production in key related sectors, relative area and national labor costs in the industry, dynamic adjustment parameters, and ongoing changes in industrial interrelationships (driven by technological changes in production processes).

Output in the non-basic sectors is modeled as a function of basic production levels, output in related local support industries (if applicable), dynamic temporal adjustments, and ongoing patterns. The interindustry linkages are obtained from the input-output (impact assessment) system which is part of the overall integrated modeling structure maintained by The Perryman

Group. Note that the dominant component of the econometric system involves the simultaneous estimation and projection of output, income, and employment at a disaggregated industrial level.

Several other components of the model are critical to the multi-regional forecasting process. The demographic module includes (1) a linkage equation between wage and salary (establishment) employment and household employment, (2) a labor force participation rate function, and (3) a complete age-cohort-survival population system with endogenous migration. Given household employment, labor force participation (which is a function of economic conditions and evolving patterns of worker preferences), and the working age population (from the age-cohort-survival model), the unemployment rate and level become identities.

The population system uses Census information, fertility rates, and life tables to determine the "natural" changes in population by age group. Migration, the most difficult segment of population dynamics to track, is estimated in relation to relative regional and extra-regional economic conditions over time. Because evolving economic conditions determine migration in the system, population changes are allowed to interact simultaneously with overall economic conditions.

Retail sales is related to income, interest rates, dynamic adjustments, and patterns in consumer behavior on a store group basis. Inflation at the state level relates to national patterns, indicators of relative economic conditions, and ongoing trends.

A final significant segment of the forecasting system relates to real estate absorption and activity. The short-term demand for various types of property is determined by underlying economic and demographic factors, with short-term adjustments to reflect the current status of the pertinent building cycle. In some instances, this portion of the forecast requires integration with the Multi-Regional Industry-Occupation System which is maintained by The Perryman Group.

The overall Texas Econometric Model contains numerous additional specifications, and individual expressions are modified to reflect alternative lag structures, empirical properties of the estimates, simulation requirements, and similar phenomena. Nonetheless, the above synopsis offers a basic understanding of the overall structure and underlying logic of the system.

Model Simulation and Multi-Regional Structure

The initial phase of the simulation process is the execution of a standard non-linear algorithm for the state system and that of each of the individual sub-areas. The external assumptions are derived from scenarios developed through national and international models and extensive analysis by The Perryman Group.

Once the initial simulations are completed, they are merged into a single system with additive constraints and interregional flows. Using information on minimum regional requirements, import needs, export potential, and locations, it becomes possible to balance the various forecasts into a mathematically consistent set of results. This process is, in effect, a disciplining exercise with regard to the individual regional (including metropolitan and rural) systems. By compelling equilibrium across all regions and sectors, the algorithm ensures that the patterns in state activity are reasonable in light of smaller area dynamics and, conversely, that the regional outlooks are within plausible performance levels for the state as a whole.

The iterative simulation process has the additional property of imposing a global convergence criterion across the entire multi-regional system, with balance being achieved simultaneously on both a sectoral and a geographic basis. This approach is particularly critical on non-linear dynamic systems, as independent simulations of individual systems often yield unstable, non-convergent outcomes.

It should be noted that the underlying data for the modeling and simulation process are frequently updated and revised by the various public and private entities compiling them. Whenever those modifications to the database occur, they bring corresponding changes to the structural parameter estimates of the various systems and the solutions to the simulation and forecasting system. The multi-regional version of the Texas Econometric Model is automatically re-estimated and simulated with each such data release, thus providing a constantly evolving and current assessment of state and local business activity.

The Final Forecast

The process described above is followed to produce the preliminary forecast. Through the comprehensive multi-regional modeling and simulation process, a systematic analysis is generated which accounts for both historical patterns in economic performance and inter-

relationships and best available information on the future course of pertinent external factors. While the best available techniques and data are employed in this effort, they are not capable of directly capturing "street sense," i.e., the contemporaneous and often non-quantifiable information that can materially affect economic outcomes. In order to provide a comprehensive approach to the prediction of business conditions, it is necessary to compile and assimilate extensive material regarding "what's happenin'" both across the state of Texas and elsewhere.

This critical aspect of the forecasting methodology includes activities such as (1) daily review of key financial and business publications and electronic information sites; (2) review of major newspapers in the state on a daily basis; (3) dozens of hours of direct telephone interviews with key business and political leaders in all parts of the state; (4) face-to-face discussions with representatives of major industry groups; and (5) frequent site visits to the various regions of the state. The insights arising from this "fact finding" are analyzed and evaluated for their effects on the likely course of the future activity.

Another vital information resource stems from the firm's ongoing interaction with key players in the international, domestic, and state economic scenes. Such activities include visiting with corporate groups on a regular basis and being regularly involved in the policy process at all levels. The firm is also an active participant in many major corporate relocations, economic development initiatives, and regulatory proceedings.

Once organized, this information is carefully assessed and, when appropriate, independently verified. The impact on specific communities and sectors that is distinct from what is captured by the econometric system is then factored into the forecast analysis. For example, the opening or closing of a major facility, particularly in a relatively small area, can cause a sudden change in business performance that will not be accounted for by either a modeling system based on historical relationships or expected (primarily national and international) factors.

The final step in the forecasting process is the integration of this material into the results in a logical and mathematically consistent manner. In some instances, this task is accomplished through "constant adjustment factors" which augment relevant equations. In other cases, anticipated changes in industrial structure or regulatory parameters are initially simulated within the context of the US Multi-Regional Impact Assessment System to estimate their ultimate effects by sector. Those findings are then factored into the simulation as constant adjustments on a distributed temporal basis. Once this scenario is formulated, the extended system is again balanced across regions and sectors through an iterative simulation algorithm analogous to that described in the preceding section.

APPENDIX C: Detailed Sectoral Results

Regional Economic Activity Dependent on Key Sectors in the Tier 1 Windstorm Insurance Area

PERCENTAGE OF OVERALL ECONOMIC ACTIVITY DIRECTLY DEPENDENT ON KEY SECTORS LOCATED IN THE TIER 1 WINDSTORM INSURANCE AREA			
AREA	**GROSS PRODUCT**	**PERSONAL INCOME**	**EMPLOYMENT**
PANHANDLE	57.59%	58.19%	44.20%
SOUTH PLAINS	43.10%	46.88%	36.58%
NORTEX	55.17%	54.19%	37.12%
NORTH CENTRAL TEXAS	36.61%	39.25%	32.66%
ARK-TEX	48.91%	49.50%	42.79%
EAST TEXAS	55.36%	56.49%	44.38%
WEST CENTRAL TEXAS	52.02%	52.16%	37.72%
RIO GRANDE	28.27%	31.92%	28.31%
PERMIAN BASIN	66.29%	66.20%	46.89%
CONCHO VALLEY	48.63%	49.93%	38.73%
HEART OF TEXAS	45.50%	45.65%	38.40%
CAPITAL AREA	31.00%	32.61%	27.29%
BRAZOS VALLEY	42.62%	42.44%	32.42%
DEEP EAST TEXAS	48.17%	51.61%	41.85%
SOUTH EAST TEXAS	63.75%	57.60%	46.13%
HOUSTON-GALVESTON AREA	48.88%	49.01%	37.16%
GOLDEN CRESCENT	60.37%	56.71%	46.44%
ALAMO AREA	30.27%	33.29%	29.24%
SOUTH TEXAS	41.76%	43.68%	38.96%
COASTAL BEND	52.10%	53.37%	41.67%
LOWER RIO GRANDE VALLEY	37.13%	42.57%	39.28%
TEXOMA	59.10%	57.68%	44.86%
CENTRAL TEXAS	24.97%	26.88%	25.29%
MIDDLE RIO GRANDE	38.48%	39.93%	38.51%
TEXAS TOTAL	**42.71%**	**43.79%**	**34.94%**
Source: The Perryman Group			

INDICATORS OF OVERALL ECONOMIC ACTIVITY DIRECTLY DEPENDENT ON KEY SECTORS LOCATED IN THE TIER 1 WINDSTORM INSURANCE AREA		
AREA	**GROSS PRODUCT** (Millions of 2009$)	**PERSONAL INCOME** (Millions of 2009$)	**EMPLOYMENT** (Thousands)
PANHANDLE	$11,835.031	$7,486.547	86.346
SOUTH PLAINS	$7,253.841	$5,021.618	70.396
NORTEX	$5,288.791	$3,205.653	34.041
NORTH CENTRAL TEXAS	$164,535.636	$101,221.949	1,110.909
ARK-TEX	$4,405.502	$3,051.485	47.336
EAST TEXAS	$18,932.045	$11,746.170	146.202
WEST CENTRAL TEXAS	$7,138.345	$4,370.539	52.358
RIO GRANDE	$7,762.674	$6,024.217	96.891
PERMIAN BASIN	$26,275.802	$13,529.831	108.493
CONCHO VALLEY	$3,009.554	$1,984.535	28.004
HEART OF TEXAS	$5,608.136	$3,552.979	56.071
CAPITAL AREA	$34,756.590	$21,575.669	267.101
BRAZOS VALLEY	$5,182.180	$3,140.124	47.762
DEEP EAST TEXAS	$4,412.512	$3,122.425	50.320
SOUTH EAST TEXAS	$13,013.858	$6,434.677	77.440
HOUSTON-GALVESTON AREA	$242,711.027	$133,556.920	1,139.173
GOLDEN CRESCENT	$6,019.222	$2,959.706	40.140
ALAMO AREA	$29,777.768	$21,278.672	302.905
SOUTH TEXAS	$3,732.729	$2,657.167	49.115
COASTAL BEND	$14,459.839	$8,915.012	111.488
LOWER RIO GRANDE VALLEY	$9,460.396	$7,697.709	159.743
TEXOMA	$4,107.771	$2,401.810	32.502
CENTRAL TEXAS	$4,190.140	$3,348.864	50.031
MIDDLE RIO GRANDE	$1,706.602	$1,224.205	24.397
TEXAS TOTAL	**$635,575.993**	**$379,508.483**	**4,189.164**
Source: The Perryman Group		

Regional Vulnerability to Storms of Varying Intensities in the Tier 1 Windstorm Insurance Area

INDICATORS OF OVERALL ECONOMIC ACTIVITY DIRECTLY VULNERABLE TO SIGNIFICANT DISRUPTIONS IN THE EVENT OF A "RITA" LEVEL STORM IN THE TIER 1 WINDSTORM INSURANCE AREA ASSUMING FULL LOCAL ABSORPTION OF INCREASED COSTS		
AREA	**GROSS PRODUCT** (Millions of 2009$)	**PERSONAL INCOME** (Millions of 2009$)	**EMPLOYMENT** (Thousands)
PANHANDLE	$199.841	$126.415	1.458
SOUTH PLAINS	$122.485	$84.793	1.189
NORTEX	$89.304	$54.129	0.575
NORTH CENTRAL TEXAS	$2,778.279	$1,709.191	18.758
ARK-TEX	$74.389	$51.526	0.799
EAST TEXAS	$319.679	$198.341	2.469
WEST CENTRAL TEXAS	$120.535	$73.799	0.884
RIO GRANDE	$131.077	$101.722	1.636
PERMIAN BASIN	$443.682	$228.459	1.832
CONCHO VALLEY	$50.818	$33.510	0.473
HEART OF TEXAS	$94.697	$59.994	0.947
CAPITAL AREA	$586.885	$364.318	4.510
BRAZOS VALLEY	$87.504	$53.023	0.806
DEEP EAST TEXAS	$74.508	$52.724	0.850
SOUTH EAST TEXAS	$219.747	$108.653	1.308
HOUSTON-GALVESTON AREA	$4,098.316	$2,255.186	19.236
GOLDEN CRESCENT	$101.638	$49.976	0.678
ALAMO AREA	$502.815	$359.303	5.115
SOUTH TEXAS	$63.029	$44.868	0.829
COASTAL BEND	$244.163	$150.535	1.883
LOWER RIO GRANDE VALLEY	$159.744	$129.980	2.697
TEXOMA	$69.362	$40.556	0.549
CENTRAL TEXAS	$70.753	$56.548	0.845
MIDDLE RIO GRANDE	$28.817	$20.671	0.412
TEXAS TOTAL	**$10,732.069**	**$6,408.220**	**70.736**

Note: Assumes that damage occurs in a "typical" segment of the Tier 1 area and that all direct rate increases are being borne locally (thus increasing risks and reducing coverage).

Source: The Perryman Group

PERCENTAGE OF OVERALL ECONOMIC ACTIVITY DIRECTLY VULNERABLE TO SIGNIFICANT DISRUPTIONS IN THE EVENT OF A "RITA" LEVEL STORM IN THE TIER 1 WINDSTORM INSURANCE AREA ASSUMING FULL LOCAL ABSORPTION OF INCREASED COSTS			
AREA	**GROSS PRODUCT**	**PERSONAL INCOME**	**EMPLOYMENT**
PANHANDLE	0.97%	0.98%	0.75%
SOUTH PLAINS	0.73%	0.79%	0.62%
NORTEX	0.93%	0.91%	0.63%
NORTH CENTRAL TEXAS	0.62%	0.66%	0.55%
ARK-TEX	0.83%	0.84%	0.72%
EAST TEXAS	0.93%	0.95%	0.75%
WEST CENTRAL TEXAS	0.88%	0.88%	0.64%
RIO GRANDE	0.48%	0.54%	0.48%
PERMIAN BASIN	1.12%	1.12%	0.79%
CONCHO VALLEY	0.82%	0.84%	0.65%
HEART OF TEXAS	0.77%	0.77%	0.65%
CAPITAL AREA	0.52%	0.55%	0.46%
BRAZOS VALLEY	0.72%	0.72%	0.55%
DEEP EAST TEXAS	0.81%	0.87%	0.71%
SOUTH EAST TEXAS	1.08%	0.97%	0.78%
HOUSTON-GALVESTON AREA	0.83%	0.83%	0.63%
GOLDEN CRESCENT	1.02%	0.96%	0.78%
ALAMO AREA	0.51%	0.56%	0.49%
SOUTH TEXAS	0.71%	0.74%	0.66%
COASTAL BEND	0.88%	0.90%	0.70%
LOWER RIO GRANDE VALLEY	0.63%	0.72%	0.66%
TEXOMA	1.00%	0.97%	0.76%
CENTRAL TEXAS	0.42%	0.45%	0.43%
MIDDLE RIO GRANDE	0.65%	0.67%	0.65%
TEXAS TOTAL	**0.72%**	**0.74%**	**0.59%**
Note: Assumes that damage occurs in a "typical" segment of the Tier 1 area and that all direct rate increases are being borne locally (thus increasing risks and reducing coverage). Source: The Perryman Group			

INDICATORS OF OVERALL ECONOMIC ACTIVITY DIRECTLY VULNERABLE TO SIGNIFICANT DISRUPTIONS IN THE EVENT OF AN "IKE" LEVEL STORM IN THE TIER 1 WINDSTORM INSURANCE AREA ASSUMING FULL LOCAL ABSORPTION OF INCREASED COSTS		
AREA	**GROSS PRODUCT** (Millions of 2009$)	**PERSONAL INCOME** (Millions of 2009$)	**EMPLOYMENT** (Thousands)
PANHANDLE	$408.824	$258.612	2.983
SOUTH PLAINS	$250.573	$173.464	2.432
NORTEX	$182.694	$110.735	1.176
NORTH CENTRAL TEXAS	$5,683.642	$3,496.564	38.375
ARK-TEX	$152.182	$105.409	1.635
EAST TEXAS	$653.980	$405.754	5.050
WEST CENTRAL TEXAS	$246.584	$150.974	1.809
RIO GRANDE	$268.150	$208.098	3.347
PERMIAN BASIN	$907.659	$467.368	3.748
CONCHO VALLEY	$103.961	$68.553	0.967
HEART OF TEXAS	$193.725	$122.732	1.937
CAPITAL AREA	$1,200.615	$745.300	9.227
BRAZOS VALLEY	$179.011	$108.471	1.650
DEEP EAST TEXAS	$152.424	$107.860	1.738
SOUTH EAST TEXAS	$449.545	$222.276	2.675
HOUSTON-GALVESTON AREA	$8,384.096	$4,613.528	39.351
GOLDEN CRESCENT	$207.925	$102.239	1.387
ALAMO AREA	$1,028.629	$735.040	10.463
SOUTH TEXAS	$128.942	$91.788	1.697
COASTAL BEND	$499.494	$307.956	3.851
LOWER RIO GRANDE VALLEY	$326.795	$265.906	5.518
TEXOMA	$141.897	$82.967	1.123
CENTRAL TEXAS	$144.742	$115.682	1.728
MIDDLE RIO GRANDE	$58.952	$42.288	0.843
TEXAS TOTAL	**$21,955.039**	**$13,109.563**	**144.709**

Note: Assumes that damage occurs in a "typical" segment of the Tier 1 area and that all direct rate increases are being borne locally (thus increasing risks and reducing coverage).

Source: The Perryman Group

PERCENTAGE OF OVERALL ECONOMIC ACTIVITY DIRECTLY VULNERABLE TO SIGNIFICANT DISRUPTIONS IN THE EVENT OF AN "IKE" LEVEL STORM IN THE TIER 1 WINDSTORM INSURANCE AREA ASSUMING FULL LOCAL ABSORPTION OF INCREASED COSTS			
AREA	**GROSS PRODUCT**	**PERSONAL INCOME**	**EMPLOYMENT**
PANHANDLE	1.99%	2.01%	1.53%
SOUTH PLAINS	1.49%	1.62%	1.26%
NORTEX	1.91%	1.87%	1.28%
NORTH CENTRAL TEXAS	1.26%	1.36%	1.13%
ARK-TEX	1.69%	1.71%	1.48%
EAST TEXAS	1.91%	1.95%	1.53%
WEST CENTRAL TEXAS	1.80%	1.80%	1.30%
RIO GRANDE	0.98%	1.10%	0.98%
PERMIAN BASIN	2.29%	2.29%	1.62%
CONCHO VALLEY	1.68%	1.72%	1.34%
HEART OF TEXAS	1.57%	1.58%	1.33%
CAPITAL AREA	1.07%	1.13%	0.94%
BRAZOS VALLEY	1.47%	1.47%	1.12%
DEEP EAST TEXAS	1.66%	1.78%	1.45%
SOUTH EAST TEXAS	2.20%	1.99%	1.59%
HOUSTON-GALVESTON AREA	1.69%	1.69%	1.28%
GOLDEN CRESCENT	2.09%	1.96%	1.60%
ALAMO AREA	1.05%	1.15%	1.01%
SOUTH TEXAS	1.44%	1.51%	1.35%
COASTAL BEND	1.80%	1.84%	1.44%
LOWER RIO GRANDE VALLEY	1.28%	1.47%	1.36%
TEXOMA	2.04%	1.99%	1.55%
CENTRAL TEXAS	0.86%	0.93%	0.87%
MIDDLE RIO GRANDE	1.33%	1.38%	1.33%
TEXAS TOTAL	**1.48%**	**1.51%**	**1.21%**

Note: Assumes that damage occurs in a "typical" segment of the Tier 1 area and that all direct rate increases are being borne locally (thus increasing risks and reducing coverage).

Source: The Perryman Group

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	GROSS PRODUCT	PERSONAL INCOME	EMPLOYMENT
INDICATORS OF OVERALL ECONOMIC ACTIVITY DIRECTLY VULNERABLE TO SIGNIFICANT DISRUPTIONS IN THE EVENT OF A "KATRINA" LEVEL STORM IN THE TIER 1 WINDSTORM INSURANCE AREA ASSUMING FULL LOCAL ABSORPTION OF INCREASED COSTS			
AREA	(Millions of 2009$)	(Millions of 2009$)	(Thousands)
PANHANDLE	$1,459.614	$923.316	10.649
SOUTH PLAINS	$894.616	$619.316	8.682
NORTEX	$652.267	$395.353	4.198
NORTH CENTRAL TEXAS	$20,292.180	$12,483.703	137.008
ARK-TEX	$543.331	$376.340	5.838
EAST TEXAS	$2,334.889	$1,448.655	18.031
WEST CENTRAL TEXAS	$880.372	$539.019	6.457
RIO GRANDE	$957.371	$742.967	11.950
PERMIAN BASIN	$3,240.595	$1,668.634	13.380
CONCHO VALLEY	$371.168	$244.753	3.454
HEART OF TEXAS	$691.651	$438.189	6.915
CAPITAL AREA	$4,286.530	$2,660.927	32.942
BRAZOS VALLEY	$639.118	$387.272	5.891
DEEP EAST TEXAS	$544.195	$385.089	6.206
SOUTH EAST TEXAS	$1,604.999	$793.589	9.551
HOUSTON-GALVESTON AREA	$29,933.551	$16,471.575	140.494
GOLDEN CRESCENT	$742.351	$365.021	4.950
ALAMO AREA	$3,672.492	$2,624.299	37.357
SOUTH TEXAS	$460.357	$327.708	6.057
COASTAL BEND	$1,783.332	$1,099.488	13.750
LOWER RIO GRANDE VALLEY	$1,166.751	$949.358	19.701
TEXOMA	$506.611	$296.215	4.008
CENTRAL TEXAS	$516.770	$413.015	6.170
MIDDLE RIO GRANDE	$210.475	$150.981	3.009
TEXAS TOTAL	**$78,385.588**	**$46,804.782**	**516.650**

Note: Assumes that damage occurs in a "typical" segment of the Tier 1 area and that all direct rate increases are being borne locally (thus increasing risks and reducing coverage).

Source: The Perryman Group

PERCENTAGE OF OVERALL ECONOMIC ACTIVITY DIRECTLY VULNERABLE TO SIGNIFICANT DISRUPTIONS IN THE EVENT OF A "KATRINA" LEVEL STORM IN THE TIER 1 WINDSTORM INSURANCE AREA ASSUMING FULL LOCAL ABSORPTION OF INCREASED COSTS			
AREA	**GROSS PRODUCT**	**PERSONAL INCOME**	**EMPLOYMENT**
PANHANDLE	7.10%	7.18%	5.45%
SOUTH PLAINS	5.32%	5.78%	4.51%
NORTEX	6.80%	6.68%	4.58%
NORTH CENTRAL TEXAS	4.51%	4.84%	4.03%
ARK-TEX	6.03%	6.11%	5.28%
EAST TEXAS	6.83%	6.97%	5.47%
WEST CENTRAL TEXAS	6.42%	6.43%	4.65%
RIO GRANDE	3.49%	3.94%	3.49%
PERMIAN BASIN	8.18%	8.17%	5.78%
CONCHO VALLEY	6.00%	6.16%	4.78%
HEART OF TEXAS	5.61%	5.63%	4.74%
CAPITAL AREA	3.82%	4.02%	3.37%
BRAZOS VALLEY	5.26%	5.23%	4.00%
DEEP EAST TEXAS	5.94%	6.36%	5.16%
SOUTH EAST TEXAS	7.86%	7.10%	5.69%
HOUSTON-GALVESTON AREA	6.03%	6.04%	4.58%
GOLDEN CRESCENT	7.45%	6.99%	5.73%
ALAMO AREA	3.73%	4.11%	3.61%
SOUTH TEXAS	5.15%	5.39%	4.81%
COASTAL BEND	6.42%	6.58%	5.14%
LOWER RIO GRANDE VALLEY	4.58%	5.25%	4.84%
TEXOMA	7.29%	7.11%	5.53%
CENTRAL TEXAS	3.08%	3.32%	3.12%
MIDDLE RIO GRANDE	4.75%	4.93%	4.75%
TEXAS TOTAL	**5.27%**	**5.40%**	**4.31%**

Note: Assumes that damage occurs in a "typical" segment of the Tier 1 area and that all direct rate increases are being borne locally (thus increasing risks and reducing coverage).

Source: The Perryman Group

APPENDIX D: Economic Forecast for the Tier 1 Coverage Area

Year	Gross Area Product	Real Gross Area Product	Personal Income (residence)	Real Personal Income (residence)	Personal Income (work)	Real Personal Income (work)	Total Employment	Wage and Salary Employment	Population	Gross Product Deflator	Texas Consumer Price Index	Industrial Production Index	Labor Productivity	Retail Sales	Real Retail Sales
2001	$252,632.787	$331,322.168	$171,264.305	$201,607.995	$161,952.272	$190,646.106	3,113.514	2,616.687	5,114.138	76.25	84.95	85.75	$12,662	$65,351.630	$76,930.281
2002	$250,774.673	$335,795.618	$169,102.786	$196,254.320	$158,344.324	$183,768.454	3,129.889	2,611.513	5,203.463	74.68	86.17	86.97	$12,858	$55,189.208	$64,050.515
2003	$268,552.410	$329,956.729	$175,861.201	$200,030.111	$163,032.861	$185,438.750	3,141.406	2,589.737	5,274.300	81.39	87.92	81.86	$12,741	$58,419.068	$66,447.701
2004	$301,400.414	$350,165.612	$185,615.194	$208,127.947	$172,972.430	$193,951.777	3,176.389	2,602.596	5,343.897	86.07	89.18	92.60	$13,454	$64,998.771	$72,882.292
2005	$329,506.735	$347,881.392	$202,990.545	$220,383.747	$185,793.016	$201,712.651	3,251.460	2,638.957	5,419.321	94.72	92.11	86.99	$13,183	$72,703.250	$78,932.813
2006	$365,991.334	$371,187.278	$225,137.533	$237,545.353	$206,475.367	$217,854.674	3,377.623	2,732.778	5,564.674	98.60	94.78	95.99	$13,583	$73,185.399	$77,218.806
2007	$407,133.141	$393,879.201	$234,173.158	$242,802.942	$215,954.474	$223,912.860	3,522.597	2,834.657	5,643.581	103.37	96.45	104.13	$13,895	$79,529.289	$82,460.115
2008	$427,663.443	$388,856.290	$261,773.492	$260,292.889	$239,318.038	$237,964.444	3,608.124	2,904.053	5,744.769	109.98	100.57	96.82	$13,390	$95,889.388	$95,347.034
2009	$387,489.226	$387,489.226	$238,591.449	$238,591.449	$215,409.375	$215,409.375	3,568.804	2,826.609	5,864.175	100.00	100.00	100.00	$13,709	$84,030.974	$84,030.974
2010	$415,769.676	$392,902.238	$250,065.803	$248,657.278	$226,176.733	$224,902.766	3,558.119	2,803.640	5,958.507	105.82	100.57	99.95	$14,014	$86,020.082	$85,535.564
2011	$460,787.228	$407,720.669	$276,658.221	$266,598.508	$250,787.498	$241,668.484	3,667.961	2,870.779	6,040.266	113.02	103.77	104.42	$14,202	$96,695.556	$93,179.559
2012	$501,723.365	$441,967.214	$294,760.601	$278,487.228	$268,742.344	$253,905.408	3,782.961	2,965.805	6,139.557	113.52	105.84	119.11	$14,902	$104,743.791	$98,961.014
2013	$558,530.365	$470,292.527	$309,324.187	$288,007.595	$282,860.164	$263,367.299	3,888.418	3,061.441	6,253.180	118.76	107.40	129.49	$15,362	$110,197.754	$102,603.649
2014	$609,316.016	$497,389.420	$326,843.777	$298,778.861	$299,603.456	$273,877.570	3,994.553	3,149.088	6,365.659	122.50	109.39	139.66	$15,795	$118,047.075	$107,910.792
2015	$658,393.534	$521,812.035	$350,473.809	$312,853.659	$320,501.536	$286,098.635	4,088.582	3,224.416	6,474.339	126.17	112.02	147.95	$16,183	$126,497.957	$112,919.562
2016	$708,661.463	$545,628.970	$375,606.827	$327,013.811	$342,670.574	$298,338.589	4,179.406	3,296.455	6,584.317	129.88	114.86	155.77	$16,552	$135,480.084	$117,952.751
2017	$760,637.503	$569,114.679	$402,322.153	$341,643.706	$366,173.498	$310,947.012	4,266.999	3,365.351	6,695.717	133.65	117.76	163.36	$16,911	$145,021.052	$123,148.898
2018	$815,106.804	$592,775.607	$430,702.086	$356,749.378	$391,075.315	$323,926.630	4,353.553	3,432.970	6,807.153	137.51	120.73	170.92	$17,267	$155,149.466	$128,509.885
2019	$872,355.308	$616,738.036	$460,831.931	$372,336.401	$417,443.107	$337,279.718	4,439.362	3,499.591	6,920.091	141.45	123.77	178.59	$17,623	$165,894.941	$134,037.425
2020	$932,659.546	$641,136.408	$492,800.013	$388,409.852	$445,346.023	$351,008.073	4,525.518	3,566.202	7,033.503	145.47	126.88	186.36	$17,978	$177,288.112	$139,733.051
2021	$996,102.321	$665,955.064	$526,697.693	$404,974.286	$474,855.262	$365,112.993	4,611.919	3,632.735	7,148.419	149.58	130.06	194.25	$18,332	$189,360.630	$145,598.105
2022	$1,062,744.070	$691,167.033	$562,619.367	$422,033.697	$506,044.050	$379,595.254	4,698.459	3,699.121	7,264.853	153.76	133.31	202.24	$18,685	$202,145.164	$151,633.726
2023	$1,132,629.854	$716,740.076	$600,662.467	$439,591.490	$538,987.607	$394,455.086	4,785.033	3,765.287	7,382.814	158.03	136.64	210.31	$19,035	$215,675.395	$157,840.840
2024	$1,205,794.312	$742,640.637	$640,927.446	$457,650.448	$573,763.112	$409,692.153	4,871.536	3,831.162	7,502.315	162.37	140.05	218.44	$19,384	$229,986.009	$164,220.148
2025	$1,282,257.357	$768,831.156	$683,517.753	$476,212.701	$610,449.656	$425,305.529	4,957.859	3,896.670	7,623.366	166.78	143.53	226.64	$19,730	$245,112.686	$170,772.118
2026	$1,362,030.419	$795,274.783	$728,539.800	$495,279.964	$649,128.187	$441,293.680	5,043.896	3,961.738	7,745.977	171.27	147.10	234.86	$20,074	$261,092.086	$177,496.972
2027	$1,445,111.807	$821,932.503	$776,102.924	$514,852.157	$689,881.447	$457,654.442	5,129.538	4,026.288	7,870.160	175.82	150.74	243.10	$20,414	$277,961.831	$184,394.677
2028	$1,531,492.788	$848,767.308	$826,319.327	$534,930.075	$732,793.898	$474,385.001	5,214.676	4,090.243	7,995.925	180.44	154.47	251.35	$20,751	$295,760.482	$191,464.935
2029	$1,621,146.012	$875,737.157	$879,304.011	$555,512.657	$777,951.644	$491,481.876	5,299.200	4,153.526	8,123.283	185.12	158.29	259.57	$21,084	$314,527.514	$198,707.174
2030	$1,714,039.967	$902,804.141	$935,174.702	$576,598.311	$825,442.337	$508,940.904	5,383.001	4,216.059	8,252.243	189.86	162.19	267.77	$21,413	$334,303.287	$206,120.536
2031	$1,810,158.807	$929,937.964	$994,051.757	$598,184.612	$875,355.077	$526,757.217	5,465.968	4,277.763	8,382.816	194.65	166.18	275.93	$21,739	$355,129.007	$213,703.870
2032	$1,909,419.796	$957,086.688	$1,056,058.060	$620,268.277	$927,780.297	$544,925.234	5,547.991	4,338.560	8,515.011	199.50	170.26	284.03	$22,060	$377,046.691	$221,455.723
2033	$2,011,752.168	$984,209.957	$1,121,318.906	$642,845.141	$982,809.645	$563,438.645	5,628.961	4,398.371	8,648.839	204.40	174.43	292.05	$22,377	$400,099.121	$229,374.333
2034	$2,117,079.863	$1,011,269.801	$1,189,961.866	$665,910.133	$1,040,535.851	$582,290.397	5,708.768	4,457.117	8,784.308	209.35	178.70	299.99	$22,689	$424,329.797	$237,457.619
2035	$2,225,320.637	$1,038,230.151	$1,262,116.641	$689,457.250	$1,101,052.579	$601,472.683	5,787.302	4,514.721	8,921.429	214.34	183.06	307.83	$22,997	$449,782.879	$245,703.176
2036	$2,336,384.931	$1,065,056.876	$1,337,914.904	$713,479.539	$1,164,454.276	$620,976.938	5,864.455	4,571.105	9,060.210	219.37	187.52	315.56	$23,300	$476,503.135	$254,108.266
2037	$2,450,178.098	$1,091,717.907	$1,417,490.118	$737,969.078	$1,230,836.005	$640,793.823	5,940.119	4,626.193	9,200.664	224.43	192.08	323.18	$23,599	$504,535.867	$262,669.816
2038	$2,566,601.654	$1,118,183.430	$1,500,977.347	$762,916.957	$1,300,293.267	$660,913.227	6,014.189	4,679.910	9,342.799	229.53	196.74	330.67	$23,893	$533,926.853	$271,384.409
2039	$2,685,554.733	$1,144,426.116	$1,588,513.044	$788,313.261	$1,372,921.812	$681,324.258	6,086.559	4,732.181	9,486.625	234.66	201.51	338.03	$24,184	$564,722.260	$280,248.279
2040	$2,806,935.691	$1,170,421.346	$1,680,234.828	$814,147.058	$1,448,817.437	$702,015.239	6,157.126	4,782.934	9,632.152	239.82	206.38	345.27	$24,471	$596,968.574	$289,257.311

GROSS AREA PRODUCT - Millions of Dollars; REAL GROSS AREA PRODUCT - Millions of 2009 Dollars; PERSONAL INCOME (By place of residence and work) - Millions of Dollars; REAL PERSONAL INCOME (By place of residence and work) - Millions of 2009 Dollars; EMPLOYMENT - Thousands of Persons; TEXAS CONSUMER PRICE INDEX - 2009 = 100; GROSS PRODUCT DEFLATOR - 2009 = 100; POPULATION - Thousands of Persons; INDUSTRIAL PRODUCTION INDEX - 2009 = 100; LABOR PRODUCTIVITY - 2009 Dollars per Employee; RETAIL SALES - Millions of Dollars; REAL RETAIL SALES - Millions of 2009 Dollars

Year	Per Capita Gross Area Product	Per Capita Real Gross Area Product	Per Capita Personal Income (by residence)	Per Capita Real Personal Income (by residence)	Per Capita Retail Sales	Per Capita Real Retail Sales
2001	$49.399	$64.786	$33.488	$39.422	$12.779	$15.043
2002	$48.194	$64.533	$32.498	$37.716	$10.606	$12.309
2003	$50.917	$62.559	$33.343	$37.925	$11.076	$12.598
2004	$56.401	$65.526	$34.734	$38.947	$12.163	$13.638
2005	$60.802	$64.193	$37.457	$40.666	$13.416	$14.565
2006	$65.770	$66.704	$40.458	$42.688	$13.152	$13.877
2007	$72.141	$69.792	$41.494	$43.023	$14.092	$14.611
2008	$74.444	$67.689	$45.567	$45.310	$16.692	$16.597
2009	$66.077	$66.077	$40.686	$40.686	$14.330	$14.330
2010	$69.777	$65.940	$41.968	$41.731	$14.437	$14.355
2011	$76.286	$67.500	$45.802	$44.137	$16.008	$15.426
2012	$81.720	$71.987	$48.010	$45.359	$17.060	$16.119
2013	$89.319	$75.209	$49.467	$46.058	$17.623	$16.408
2014	$95.719	$78.136	$51.345	$46.936	$18.544	$16.952
2015	$101.693	$80.597	$54.133	$48.322	$19.538	$17.441
2016	$107.629	$82.868	$57.046	$49.666	$20.576	$17.914
2017	$113.601	$84.997	$60.086	$51.024	$21.659	$18.392
2018	$119.743	$87.081	$63.272	$52.408	$22.792	$18.879
2019	$126.061	$89.123	$66.593	$53.805	$23.973	$19.369
2020	$132.602	$91.155	$70.065	$55.223	$25.206	$19.867
2021	$139.346	$93.161	$73.680	$56.652	$26.490	$20.368
2022	$146.286	$95.138	$77.444	$58.093	$27.825	$20.872
2023	$153.414	$97.082	$81.360	$59.543	$29.213	$21.379
2024	$160.723	$98.988	$85.431	$61.001	$30.655	$21.889
2025	$168.201	$100.852	$89.661	$62.468	$32.153	$22.401
2026	$175.837	$102.669	$94.054	$63.940	$33.707	$22.915
2027	$183.619	$104.437	$98.613	$65.418	$35.318	$23.430
2028	$191.534	$106.150	$103.343	$66.900	$36.989	$23.945
2029	$199.568	$107.806	$108.245	$68.385	$38.719	$24.461
2030	$207.706	$109.401	$113.324	$69.872	$40.511	$24.978
2031	$215.937	$110.934	$118.582	$71.358	$42.364	$25.493
2032	$224.242	$112.400	$124.023	$72.844	$44.280	$26.008
2033	$232.604	$113.797	$129.650	$74.327	$46.260	$26.521
2034	$241.007	$115.122	$135.464	$75.807	$48.305	$27.032
2035	$249.435	$116.375	$141.470	$77.281	$50.416	$27.541
2036	$257.873	$117.553	$147.669	$78.749	$52.593	$28.047
2037	$266.304	$118.656	$154.064	$80.208	$54.837	$28.549
2038	$274.714	$119.684	$160.656	$81.658	$57.148	$29.047
2039	$283.089	$120.636	$167.448	$83.097	$59.528	$29.541
2040	$291.413	$121.512	$174.440	$84.524	$61.977	$30.030

PER CAPITA GROSS AREA PRODUCT - Thousands of Dollars; PER CAPITA REAL GROSS AREA PRODUCT - Thousands of 2009 Dollars; PER CAPITA PERSONAL INCOME (By place of residence and work) - Thousands of Dollars; PER CAPITA REAL PERSONAL INCOME (By place of residence and work) - Thousands of 2009 Dollars; PER CAPITA RETAIL SALES - Thousands of Dollars; PER CAPITA REAL RETAIL SALES - Thousands of 2009 Dollars