

Testimony of Dr. Kelvin K. Droegemeier
Professor of Meteorology, University of Oklahoma
Member of the National Science Board and Co-Chair, National Science Board Task Force on Hurricane
Science and Engineering
Submitted June 24, 2008 to the Subcommittee on Energy and Environment, and Subcommittee on
Research and Science Education
U.S. House of Representatives Committee on Science and Technology
Regarding the State of Hurricane Research and H.R. 2407, the National Hurricane Research Initiative Act
of 2007

I thank Chairman Lampson, Chairman Baird, Ranking Members Ehlens and Inglis, and the other Members of the two Committees for the opportunity to speak with you today. My name is Kelvin Droegemeier and I am a professor of meteorology at the University of Oklahoma. I also am a member of the National Science Board and am appearing before you today in my role as co-chair of the National Science Board's Task Force on Hurricane Science and Engineering. The final report of this Task Force was published on January 12, 2007, and I understand that it largely served as the blueprint for H.R. 2407 as introduced in the House of Representatives. Dr. Kenneth Ford, Director of the Institute for Human and Machine Cognition and fellow NSB member, served as my co-chair.

I needn't tell you that every year, hurricanes pose a threat to life, property, and the very economic vitality of our Nation. Yet impact of hurricanes extends well beyond a given storm, often for many years, as we've seen in recent storms such as Katrina and Rita. Among all weather hazards in the US, hurricanes account for over half the total damage inflicted, and annual economic losses average approximately \$10 billion in constant 2006 dollars. Of course, the 2005 hurricane season was notably destructive, with Katrina losses exceeding \$130 billion. Remarkably, 50% of the US population lives within 50 miles of a coastline and that some 80% of our population resides within 200 miles of a coast. The \$3 trillion of physical infrastructure in the Gulf and Atlantic coastal regions continues to grow at a rapid pace, and thus we as a Nation are increasingly vulnerable to hurricanes. Of particular relevance today is the immense energy infrastructure located in "hurricane alley" -- 33,000 miles of pipeline that transports some 30% of our Nation's domestically-produced oil and gas from offshore wells to onshore refineries. According to the U.S. Department of the Interior, some 3,000 of the Gulf's 4,000 platforms, and 22,000 of the 33,000 miles of the Gulf's pipelines, were in the direct paths of Hurricanes Katrina and Rita. A total of 115 offshore platforms were destroyed, 52 were damaged, and 535 pipeline segments were damaged. Considerable destruction occurred to onshore facilities -- for example, refineries and supporting infrastructures in and around Lake Charles, Louisiana. More than nine months later, 22% of Federal oil production and 13% of natural gas production remained unavailable, resulting in the loss of 150 million barrels of oil and 730 billion cubic feet of gas from domestic supplies.

Motivated in part by recent hurricanes, the National Science Board decided to undertake an intensive effort to frame the hurricane science and engineering research challenges and recommend a national imperative to address them in a holistic manner. We did so by engaging the academic, government and private sector communities in a series of workshops; by evaluating previous studies of hurricanes and other natural disasters; and by obtaining input from the public on a draft version of the report.

As you well know, we spend billions of dollars on rescue and recovery after hurricanes occur. But can we better anticipate and react to hurricanes ahead of time to avoid loss of life, property, vital infrastructures, and disruptions in our economy? The answer from our study is yes. Are we using existing knowledge effectively? The answer from our study is no. Is the research now being done adequate and properly coordinated? The answer from our study is no. In fact, research in hurricanes appears to be a modest, loosely coordinated enterprise. Although of high quality, this research is generally conducted within the boundaries of traditional disciplines -- stovepipes like meteorology, hydrology, engineering, computer science and ecology -- with insufficient integration. And the engagement of social, economic, behavioral sciences is inadequate. In short, the hurricane is perhaps one of the best examples of a problem -- vital to society -- which must be studied in a multi-disciplinary fashion if we hope to lessen our vulnerability.

H.R. 2407 reflects very closely the recommendations made in our report. This truly is a wonderful testimony of Congress responding quickly to recommendations of the broad community and using existing frameworks (such as OSTP and the National Windstorm Impact Reduction Act) to deal with a profoundly important problem. Given that you are familiar with the bill, I wish to highlight just a few key points.

First, strong collaboration between NSF and NOAA is vital to the success of this effort, as is the involvement of other agencies, as articulated in the bill. Second, it is important to note that the hurricane is not a weather problem alone but rather a weather-driven problem that must be studied in a multi-disciplinary fashion. It is for this reason that the components of the research agenda described in the bill – including, for example, hurricane intensity change, assessment and response of structures to wind and waves, ecosystem impacts, and economic and societal impacts – are important and must be performed in a coordinated manner. Third, the national infrastructure data base is important for hurricanes but also for numerous other uses, ranging from earthquakes to homeland security. Fourth, the National Hurricane Research Model – which in our report was referred to as a Test Bed and involves all relevant disciplines of the research program – is essential for bringing together the research components and moving them to operational practice.

* * * * *

On behalf of the National Science Board and our Chairman, Dr. Steven Beering, I want to thank the Committees for the important work they do for U.S. scientific research, education, and training. We appreciate your attention to the recommendations of the Board and stand ready to assist in whatever ways might be most beneficial.

Dr. Kelvin K. Droegemeier
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Kelvin K. Droegemeier earned a B.S. with Special Distinction in Meteorology in 1980 from the University of Oklahoma, and M.S. and Ph.D. degrees in atmospheric science in 1982 and 1985, respectively, from the University of Illinois at Urbana-Champaign under the direction of R. Wilhelmson. He joined the University of Oklahoma in September, 1985 as an Assistant Professor of Meteorology, and was tenured and promoted to Associate Professor in July, 1991, and promoted to Professor in July, 1998. Dr. Droegemeier was co-founder in 1989 of the NSF Science and Technology Center (STC) for Analysis and Prediction of Storms (CAPS), and served for five years as its deputy director. He then directed CAPS from 1994 until 2006, and today CAPS is recognized around the world as the pioneer of storm-scale numerical weather prediction. Dr. Droegemeier is now Director Emeritus of CAPS. In 1998, Dr. Droegemeier was named a President's Associates Presidential Professor at the University of Oklahoma, and for 2 years, beginning in summer 1999, wrote a daily weather science column for the *Daily Oklahoman* newspaper, which is Oklahoma's largest. He was awarded a Regents' Professorship at OU in fall, 2001, which is a life-long title. In 2003, Dr. Droegemeier co-founded the NSF Engineering Research Center for Collaborative Adaptive Sensing of the Atmosphere (CASA) and currently serves as its deputy director. He is the only person in the nation to have co-founded an NSF Science and Technology Center and an NSF Engineering Research Center. In 2004, he was awarded the Roger and Sherry Teigen Presidential Professorship and became the first OU professor to receive two Presidential Professorships. In 2005, he was named the Weathernews Chair in Applied Meteorology at the University of Oklahoma and also the Director of the Sasaki Institute, a non-profit organization that fosters the development and application of knowledge, policy, and advanced technology in the government, academic and private sectors. In 2004, Dr. Droegemeier was appointed by President George W. Bush to a 6-year term on the National Science Board, the governing body of the National Science Foundation that also provides science policy guidance to the Congress and President. In 2005, Dr. Droegemeier was appointed Associate Vice President for Research at the University of Oklahoma.

In 1987, Dr. Droegemeier was named a Presidential Young Investigator by the National Science Foundation. As director of the CAPS model development project for 5 years, he managed the creation of a multi-scale numerical prediction system that has helped pioneer the science of storm-scale numerical forecasting. This computer model was a finalist for the 1993 National Gordon Bell Prize in High Performance Computing. In 1997, Dr. Droegemeier received the *Discover Magazine* Award for Technology Innovation (computer software category), and also in 1997 CAPS was awarded the *Computerworld* Smithsonian Award (science category). Droegemeier also is a recipient of the NSF Pioneer Award and the Federal Aviation Administration's Excellence in Aviation Award.

Dr. Droegemeier has been a major force behind the development and application of high performance computing systems both at OU and across the US. In 1989 and 1990, he chaired the OU Computing Advisory Committee and was the lead author on a 5-year strategic plan. He has served on numerous NSF High Performance Computing and Communication panels and is a member of the NCSA User Advisory

Committee. In 1995 he created as principal investigator, and now directs, a \$1.4 million NSF/OU project known as the Environmental Computing Applications System. He served on the National Science Foundation's Blue Ribbon Panel on Cyberinfrastructure, and is a member of the Board of Directors of the OU Supercomputer Center for Education and Research (OSCER), which he helped establish. Dr. Droegemeier is now a member of the Advisory Committee for the National Center for Computational Sciences and the Computer Science and Math Division at Oak Ridge National Laboratory.

Dr. Droegemeier is a national leader in the creation of partnerships among academia, government and industry. He initiated and led a 3-year, \$1M partnership with American Airlines to customize weather prediction technology for commercial aviation, and this resulted in him founding a private company, Weather Decision Technologies, Inc., located in Norman, that is commercializing advanced weather technology developed by the University of Oklahoma and other organizations. The success with American Airlines also played a role in the establishment in Oklahoma of the Aviation Services Division of Weathernews, the world's largest private weather company. Dr. Droegemeier led a \$10.6M research alliance with Williams Energy Marketing and Trading Company in Tulsa, which is the largest such partnership between a university and a private company in the field of meteorology. He initiated and led the Collaborative Radar Acquisition Field Test (CRAFT), a national project directed toward developing strategies for the real time delivery of NEXRAD radar data via the Internet. CRAFT won two awards from the National Oceanic and Atmospheric Administration, and its success led the National Weather Service to adopt its Internet data delivery strategy. As a follow-on to CRAFT, Droegemeier established Integrated Radar Data Services (IRaDS) at OU, which is a National Weather Service-designed top-tier provider of NEXRAD radar data to private industry.

Dr. Droegemeier's research interests lie in thunderstorm dynamics and predictability, variational data assimilation, mesoscale dynamics, computational fluid dynamics, massively parallel computing, and aviation weather. He has served as an associate editor for *Monthly Weather Review* for 6 years served on the UCAR University Relations Committee, the last two as chair. Elected to the UCAR Board of Trustees in 2002 and as its Vice Chairman in 2003, he became Chairman of the Board in 2004. Dr. Droegemeier has served as a consultant to Honeywell Corporation, American Airlines, the National Transportation Safety Board, and Climatological Consulting Corp. Dr. Droegemeier has graduated 27 students and served on the committees of numerous others. He has served on the Advisory Committee for the Geosciences Directorate at the National Science Foundation and the NSF Advisory Committee for the Computer Information Science and Engineering Directorate.

In his 23 years at the University of Oklahoma, Dr. Droegemeier has generated over \$40 million in external research funding. For over a decade, he has been among the top 5 faculty at the University of Oklahoma in external research grant funding, averaging over \$2 million per year. Dr. Droegemeier has been an invited speaker at or organizer of several international conferences and symposia on meteorology, high-performance computing, and computational fluid dynamics in the U.S., England, Japan, Australia, Korea, and France, notably the series of Joint US-Korea Workshops on Storm and Mesoscale Weather Analysis and Prediction, which he initiated in the mid 1990s. He has authored and co-authored more than 60 refereed journal articles and over 200 conference publications, and is a former Vice President of the Central Oklahoma Chapters of the American Meteorological Society and National Weather Association. He is a former Member of the Board of Directors of the Norman, OK Chamber of Commerce and chaired the Weather and Climate Team for Governor Brad Henry's EDGE (Economic Development Generating Excellence) Program. He is a Fellow of the American Meteorological Society, and served as a Councilor from 2005-2008.

Personal Financial Disclosure Form

Instructions: Please complete this form to the best of your ability. Return the completed form to the Committee on Science and Technology at least 24 hours prior to the hearing at which you will testify. You need only disclose personal financial interests which are relevant to the subject matter of your testimony or the subject matter of the hearing at which you will testify. Please list all appropriate interests for the past two (2) years. If you need additional space, please continue your responses on a separate sheet of paper.

Government research grants or contracts:

- “Engineering Research Center for Collaborative Adaptive Sensing of the Atmosphere (CASA).” National Science Foundation, Co-Principal Investigator and Deputy Director, \$18,526,815 awarded to date.
- "Collaborative Research: ITR Linked Environments for Atmospheric Discovery (LEAD).” National Science Foundation, Principal Investigator, \$1,995,096 awarded to date.
- “Assimilating Doppler Radar Data for Storm-Scale Numerical Prediction Using an Ensemble-Based Variational Method.” National Science Foundation, Co-Principal Investigator, \$199,990 awarded to date.
- “Advancing Biotechnology and Climatology (ABC): Educating for Economic Growth in Oklahoma.” National Science Foundation, Co-Principal Investigator, \$598,599 awarded to date.
- “A Partnership to Develop, Conduct and Evaluate Realtime High-Resolution Ensemble and Deterministic Forecasts for Convective-Scale Hazardous Weather.” National Oceanic and Atmospheric Administration, Principal Investigator, total budget of \$374,825.

Non-Government research grants or contracts:

- “Technical Support for the WRF Ensemble Reforecast System.” Atmospheric Technology Services Company, Inc. (SBIR from DTRA), Co-Principal Investigator, total budget of \$56,290.

Government Employment or other compensation:

- Special Government Employee when serving as a Member of the National Science Board. Term runs from 2004-2010.

Non-Government Employment or other compensation:

- Professor of Meteorology, University of Oklahoma. Current annual base salary of \$205,731.
- Member, Microsoft Research Technical Computing Science Advisory Board. Compensation of \$5,000 per year
- University of Oklahoma Foundation (Presidential Professorship), \$5,000 per year

Stock or stock options in public or privately held companies:

- Retirement account at TIAA-CREF. Present value of \$442,006.26.
 - 51.6% in Retirement Annuities, SRAs, IRAs and Keoughs
 - 23.5% in CREF Equities Stock (see summary below of key holdings)
 - 24.9% in Money Market
- Brokerage Account at TIAA-CREF. Present value of \$141,254.68
 - Equities

Security Description	Quantity	Price	Market Value
ABT ABBOTT LABS COM	<u>25</u>	54.29	\$1,357.25
A AGILENT TECHNOLOGIES INC COM	<u>20</u>	37.08	\$741.60
AA ALCOA INC COM	<u>50</u>	37.71	\$1,885.50
AMZN AMAZON COM INC	<u>30</u>	80.68	\$2,420.40
AXP AMERICAN EXPRESS COMPANY	<u>20</u>	40.88	\$817.60
AIG AMERICAN INTERNATIONAL GROUP INC	<u>35</u>	30.30	\$1,060.50
AMGN AMGEN INC	<u>30</u>	45.89	\$1,376.70
APC ANADARKO PETE CORP	<u>55</u>	78.03	\$4,291.65
AMAT APPLIED MATERIALS INC	<u>35</u>	19.75	\$691.25
ADSK AUTODESK INC COM	<u>10</u>	36.09	\$360.90
BJS BJ SVCS CO COM	<u>15</u>	33.49	\$502.35
BAC BANK OF AMERICA COM	<u>15</u>	25.88	\$388.20
BBBY BED BATH & BEYOND INC	<u>20</u>	28.09	\$561.80
BRK B BERKSHIRE HATHAWAY HLDG CO CL B COM	<u>1</u>	4065.00	\$4,065.00
BIIB BIOGEN IDEC INC COM	<u>55</u>	56.53	\$3,109.15
BA BOEING CO COM	<u>5</u>	75.59	\$377.95
BRCM BROADCOM CORP CL A	<u>20</u>	26.99	\$539.80
CVC CABLEVISION SYS CORP (NEW) NY GROUP CL A COM	<u>45</u>	23.60	\$1,062.00
CAT CATERPILLAR INC	<u>15</u>	80.00	\$1,200.00
CVX CHEVRON CORP COM NEW	<u>5</u>	99.06	\$495.30
CB CHUBB CORP	<u>30</u>	50.83	\$1,524.90
CSCO CISCO SYSTEMS INC	<u>110</u>	24.55	\$2,700.50
KO COCA COLA COMPANY	<u>35</u>	53.26	\$1,864.10
CMCSK COMCAST CORP NEW CL A SPL	<u>105</u>	18.95	\$1,989.75
CREE CREE INC COM	<u>25</u>	24.10	\$602.50

DELL	DELL INC COM	45	23.41	\$1,053.45
DIS	DISNEY WALT COMPANY HOLDING CO	99	32.39	\$3,206.61
DISCA	DISCOVERY HLDG CO COM SER A	24	23.68	\$568.32
DOV	DOVER CORP	5	52.18	\$260.90
DOW	DOW CHEM CO	5	37.62	\$188.10
DD	DU PONT E I DE NEMOURS & COMPANY	10	45.47	\$454.70
EBAY	EBAY INC COM	25	27.73	\$693.25
ERTS	ELECTRONIC ARTS	10	46.04	\$460.40
EMR	EMERSON ELECTRIC CO COM	40	53.63	\$2,145.20
EXPE	EXPEDIA INC DEL COM	45	19.69	\$886.05
XOM	EXXON MOBIL CORP COM	30	87.70	\$2,631.00
FRX	FOREST LABS INC	25	32.57	\$814.25
GPS	GAP INC	40	16.90	\$676.00
DNA	GENENTECH INC COM NEW	20	74.18	\$1,483.60
GE	GENERAL ELECTRIC CO COM	60	27.40	\$1,644.00
GENZ	GENZYME CORP COM FORMERLY COM GEN DIV TO 5/27/2004	30	70.00	\$2,100.00
GSK	GLAXOSMITHKLINE PLC SPONS ADR	20	43.90	\$878.00
HD	HOME DEPOT INC COM	60	25.06	\$1,503.60
HON	HONEYWELL INTL INC COM ISIN#US4385161066	25	54.99	\$1,374.75
IACI	IAC/INTERACTIVECORP COM NEW	27	20.24	\$546.48
INTC	INTEL CORP COM	90	22.36	\$2,012.40
IBM	INTERNATIONAL BUSINESS MACHS CORP COM	5	123.46	\$617.30
IPG	INTERPUBLIC GROUP COS INC	50	9.01	\$450.50
JPM	JP MORGAN CHASE & CO COM ISIN#US46625H1005	35	36.87	\$1,290.45
JNJ	JOHNSON & JOHNSON COM	45	64.29	\$2,893.05
KMB	KIMBERLY CLARK CORP	15	61.23	\$918.45
LLL	L 3 COMMUNICATIONS HLDGS INC COM	15	94.47	\$1,417.05
LEH	LEHMAN BROTHERS HOLDINGS INC COMMON	30	22.80	\$684.00
LBTYA	LIBERTY GLOBAL INC COM SER A	6	31.63	\$189.78
LBTYK	LIBERTY GLOBAL INC COM SER C	6	30.38	\$182.28
LINTA	LIBERTY MEDIA HLDG CORP INTERACTIVE COM SER A	61	15.97	\$974.17
LCAPA	LIBERTY MEDIA HLDG CORP CAP COM SER A	12	15.00	\$180.00
LMDIA	LIBERTY MEDIA CORP NEW ENTMT COM SER A	48	26.00	\$1,248.00
LLY	LILLY ELI & CO COM	10	47.60	\$476.00
MER	MERRILL LYNCH & CO INC	40	34.54	\$1,381.60
MSFT	MICROSOFT CORP COM	105	27.97	\$2,936.85
MU	MICRON TECHNOLOGY INC	75	7.01	\$525.75
MOT	MOTOROLA INC	60	7.44	\$446.40
NOV	NATIONAL OILWELL VARCO INC	4	91.55	\$366.20
NWS	NEWS CORP CL B	70	16.53	\$1,157.10

NVS	NOVARTIS AG SPONSORED ADR	10	51.59	\$515.90
NVLS	NOVELLUS SYSTEM INC	25	21.22	\$530.50
PMI	PMI GROUP INC COM	30	3.19	\$95.70
PLL	PALL CORP	25	41.92	\$1,048.00
PEP	PEPSICO INC	25	64.63	\$1,615.75
PFE	PFIZER INC COM	115	17.38	\$1,998.70
PG	PROCTER & GAMBLE CO	20	62.93	\$1,258.60
RTN	RAYTHEON CO COM NEW	30	57.37	\$1,721.10
SNDK	SANDISK CORP	20	20.78	\$415.60
SSD	SIMPSON MANUFACTURING CO	10	24.07	\$240.70
STT	STATE STREET CORP COM	15	66.53	\$997.95
TSM	TAIWAN SEMICONDUCTOR MFG CO SPONSORED ADR ISIN#US8740391003	97	10.88	\$1,055.36
TXN	TEXAS INSTRUMENTS INC	75	29.02	\$2,176.50
TWX	TIME WARNER INC NEW COM	160	14.62	\$2,339.20
UL	UNILEVER PLC SPON ADR NEW ISIN#US9047677045	45	28.84	\$1,297.80
UNH	UNITEDHEALTH GROUP INC COM	60	26.39	\$1,583.40
VRSN	VERISIGN INC COM	15	39.07	\$586.05
VZ	VERIZON COMMUNICATIONS COM	25	35.91	\$897.75
VOD	VODAFONE GROUP PLC SPON ADR NEW	39	28.42	\$1,108.38
WMT	WAL MART STORES INC	15	56.64	\$849.60
WY	WEYERHAEUSER CO	20	53.07	\$1,061.40
WMB	WILLIAMS COS INC COM	30	39.13	\$1,173.90
WWY	WRIGLEY WM JR CO COM	25	78.26	\$1,956.50
WYE	WYETH	30	47.85	\$1,435.50
YHOO	YAHOO INC COM	55	21.45	\$1,179.75
COV	COVIDIEN LTD SHS ISIN#BMG2552X1083	16	46.84	\$749.44
STX	SEAGATE TECHNOLOGY SHS ISIN#KYG7945J1040	40	19.87	\$794.90
RIG	TRANSOCEAN INC NEW SHS ISIN#KYG900731004	7	154.77	\$1,083.38
TYC	TYCO INTERNATIONAL LTD BERMUDA SHS ISIN#BMG9143X2082	16	42.90	\$686.40
TEL	TYCO ELECTRONICS LTD SHS	20	36.26	\$725.20
WFT	WEATHERFORD INTL LTD BERMUDA COM ISIN#BMG950891017	100	46.73	\$4,673.00
VRGY	VERIGY LTD SHS	20	23.23	\$464.60

o Mutual Funds

Security Description	Quantity	Price	Market Value
SHRAX LEGG MASON PARTNERS AGGRESSIVE GROWTH FUND CLASS A	78.59	105.15	\$8,264.05
SHFVX LEGG MASON PARTNERS FUNDAMENTAL	783.93	13.89	\$10,888.84

VALUE FUND CLASS A

○ Cash and Equivalent

Security	Description	Quantity	Price	Market Value
RESERV	RESERVE INSURED DEPOSITS	<u>3882.64</u>	1.00	\$3,882.64

- True North Global, Inc (privately held company). Total of 40,956 shares of stock valued at \$2.25 per share for a total value of \$92,151.

Name: Kelvin K. Droegemeier

Signature 

Date: 24 June 2008

CREF STOCK ACCOUNT

AS OF 3/31/2008

ESTIMATED ANNUAL EXPENSES
0.55% *

NET ASSETS
\$119.42 billion

INCEPTION DATE
08/01/1952

BENCHMARK INDEX
CREF Composite Benchmark (Russell 3000® Index, MSCI EAFE® +Canada Index, MSCI EAFE® +Canada Small Cap Index, and MSCI Emerging Markets IndexSM)

INVESTMENT OBJECTIVE

This variable annuity account seeks a favorable long-term rate of return through capital appreciation and investment income by investing primarily in a broadly diversified portfolio of common stocks.

PORTFOLIO STRATEGIES

Invests at least 80% of its assets in a broadly diversified portfolio of domestic and foreign equity securities by using a combination of three strategies: active management, enhanced indexing and pure indexing. The account may invest in companies of any size and will invest a small percentage of its foreign investments in emerging-market securities.

Annuities are designed for retirement savings or for other long-term goals. They offer several payment options, including lifetime income. Payments from TIAA-CREF variable annuities are not guaranteed, and the payment amounts will rise or fall depending on investment returns.

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PERFORMANCE

	TOTAL RETURN		AVERAGE ANNUAL TOTAL RETURN		
	3 Months	YTD	1 Year	5 Years	10 Years
CREF Stock Account	-9.65%	-9.65%	-4.61%	13.76%	4.21%
CREF Composite Benchmark	-9.36	-9.36	-4.59	14.16	4.56
Russell 3000 Index	-9.52	-9.52	-6.06	12.05	3.87
MSCI EAFE + Canada Index	-8.69	-8.69	-1.29	21.78	6.56
MSCI EAFE + Canada Small Cap Index [†]	-6.45	-6.45	-9.93	25.42	-
MSCI Emerging Markets Index	-10.99	-10.99	21.33	35.49	-

[†] This index was added to the account's composite benchmark on March 17, 2008.

The performance data quoted represents past performance and is no guarantee of future results. Your returns and the principal value of your investment will fluctuate so that your accumulation units, when redeemed, may be worth more or less than their original cost. Current performance may differ from figures shown above. For performance current to the most recent month-end, visit TIAA-CREF at www.tiaa-cref.org, or call 800 842-2252.

TOP 10 HOLDINGS

Issuer	% Net Assets
General Electric Co	2.03
ExxonMobil Corp	2.00
Microsoft Corp	1.24
AT&T, Inc	1.12
Procter & Gamble Co	1.04
Johnson & Johnson	1.01
Bank of America Corp	0.81
Cisco Systems, Inc	0.78
IBM Corp	0.77
JPMorgan Chase & Co	0.76

PORTFOLIO COMPOSITION

	% Portfolio Investments
Total Domestic	73.7
Total Foreign Equity	26.2
Short-Term Investments	0.1

HOLDINGS BY COMPANY SIZE

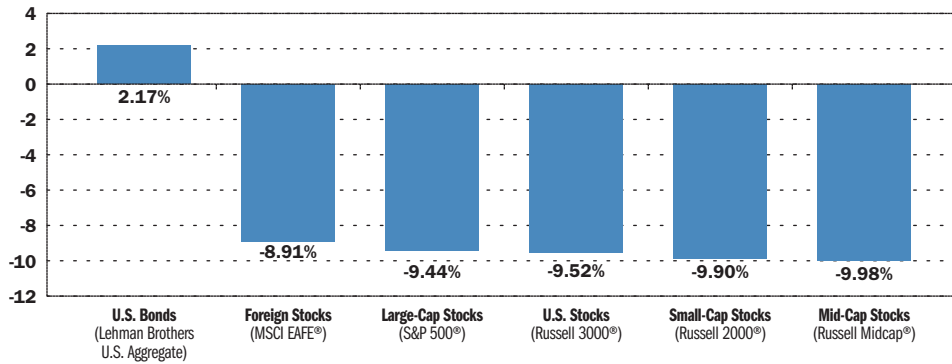
	% Portfolio Investments
Over \$15 billion	67.71
\$4 billion - \$15 billion	18.94
Under \$4 billion	13.35

* Reflects estimated annual expenses for the period from 5/1/2007 through 4/30/2008. As of 5/1/2008, estimated annual expenses for this account may differ from the figure shown above. Please see the current prospectus for details. We estimate expenses for the coming year based on projected expenses, asset levels and other relevant factors. At the end of each quarter, we compare these projections with the account's actual experience and adjust the account's expenses upward or downward to reflect any difference. These adjustments are made in equal daily installments over the remaining days of the new quarter.



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RETURNS FOR MAJOR BENCHMARKS FOR QUARTER ENDED 3/31/2008



The bar graph above shows the returns of several leading market indexes. This allows you to compare the performance of your investment with several areas of the financial marketplace during the last quarter.

STOCKS WITH LARGEST EFFECTS ON PERFORMANCE DURING THE QUARTER (Weightings are in relation to the portfolio's benchmark. Overweights may include nonbenchmark stocks.): CREF Stock Account

	POSITIVE EFFECTS	NEGATIVE EFFECTS
OVERWEIGHTS	XTO Energy Inc Apache Corp Darden Restaurants Inc	Bear Stearns Cos Merck & Co Inc Sprint Nextel Corp
UNDERWEIGHTS	Citigroup Inc Wachovia Corp American International Group Inc	ArcelorMittal SA HSBC Holdings plc Pfizer Inc

IMPORTANT INFORMATION

Investing in this account involves a number of risks. Investing in foreign securities involves special risks, including currency fluctuation and political and economic instability. These investment risks may be magnified in emerging markets. The account may invest in small- and mid-cap stocks, which are subject to more abrupt or erratic market conditions than large-cap stocks. For a detailed discussion of risk, consult the prospectus.

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CREF-2

EXPENSES

Expenses are an important aspect of investing. To pay for the operation and management of an account, each investor is charged an expense fee, which is calculated as a percentage of the amount the investor has in the account. Even if the account loses money during a period, the fee is still charged. Although an annual expense fee may seem relatively small, its effect on performance over time can be substantial. TIAA-CREF has some of the lowest expense charges in the industry.*

* Morningstar Direct (February 2008) based on Morningstar expense comparisons by category.

PORTFOLIO MANAGEMENT

The CREF Stock Account is managed by the portfolio management team of TIAA-CREF Investment Management, LLC. Team members are responsible for the day-to-day operations of the account.

ABOUT THIS ACCOUNT'S BENCHMARK(S)

The account's composite benchmark is a weighted average of four indexes: the Russell 3000 Index (representing the broad U.S. stock market); the MSCI EAFE+Canada Index (stocks in 22 foreign developed nations); the MSCI EAFE+Canada Small Cap Index, (small-cap stocks in those 22 foreign developed nations); and the MSCI Emerging Markets IndexSM (stocks in 25 emerging-market nations). You cannot invest directly in these indexes. The composite benchmark's weightings are recalculated daily: on 3/31/2008, the U.S. segment was 75.0%, the foreign developed-markets segment 22.6%, the foreign developed-markets small-cap segment 0.1% and the emerging-markets segment 2.3%.

TIAA-CREF: FINANCIAL SERVICES FOR THE GREATER GOOD[®]

Since 1918, we have helped millions of people at America's academic, medical, cultural and research institutions plan for the future.

TIAA-CREF is one of the largest financial services organizations in the world, with more than \$415 billion in combined assets under management as of March 31, 2008.