Supplementary Materials

Table 5 Results of LSA for Hurricane Katrina for 3 different queries. Words are ordered based on their cosine distance from the query vector. Includes the 100 words most similar to the query.

	Hurricane Katrina LSA													
	"climate"	Similarity	"energy"	Similarity	"climate, energy"	Similarity		"climate"	Similarity	"energy"	Similarity	"climate, energy"	Similarity
1	climate	1.000	energy	1.000	energy	0.979	51	supposedly	0.746	conocophillips	0.929	retailers	0.908
2	larger	0.866	prices	0.986	prices	0.952	52	boogie	0.746	jumped	0.928	citroen	0.907
3	destroy	0.861	exchange	0.968	deutsche	0.945	53	theories	0.746	citroen	0.927	behravesh	0.907
4	formally	0.848	consumers	0.966	price	0.943	54	nurtured	0.745	tumbling	0.926	traders	0.906
5	theory	0.844	weinberg	0.966	underinvestment	0.943	55	raw	0.745	mercantile	0.925	producers	0.905
6	sound	0.837	argus	0.964	signaling	0.941	56	topics	0.744	production	0.924	idled	0.905
7	gale	0.826	reidy	0.962	discounting	0.940	57	sounded	0.743	embargo	0.923	products	0.905
8	reinforced	0.817	splurge	0.960	java	0.940	58	cynthia	0.742	putins	0.922	tenth	0.904
9	journal	0.815	hummer	0.960	argus	0.939	59	deadly	0.742	shutdowns	0.920	export	0.904
10	sensitive	0.814	markets	0.959	hummer	0.938	60	sacrifice	0.741	reserve	0.920	commodity	0.904
11	unlikely	0.812	downers	0.958	oil	0.937	61	certain	0.740	crude	0.920	imports	0.903
12	belief	0.809	highs	0.958	consumers	0.937	62	cataclysmic	0.740	arabica	0.920	adjusting	0.903
13	phenomenon	0.809	underinvestment	0.957	shocks	0.934	63	nor	0.740	pretax	0.919	yergin	0.902
14	rail	0.800	exporting	0.954	weinberg	0.934	64	reconstructed	0.739	mobil	0.919	artificially	0.902
15	studying	0.796	price	0.954	markets	0.934	65	assessments	0.739	soaring	0.919	nariman	0.902
16	wealthy	0.795	reserves	0.954	profits	0.931	66	haunting	0.738	uncharted	0.919	cents	0.902
17	brings	0.792	signaling	0.953	reserves	0.931	67	continuing	0.737	imports	0.919	tightness	0.902
18	barge	0.792	dampening	0.950	exchange	0.931	68	transforming	0.737	chevrons	0.919	subjective	0.902
19	ancient	0.791	oil	0.950	peaks	0.931	69	william	0.737	exxon	0.917	doha	0.901
20	masters	0.786	java	0.949	highs	0.929	70	regard	0.736	manifold	0.917	spikes	0.900
21	politicians	0.785	cents	0.948	splurge	0.927	71	vicinity	0.736	trading	0.916	winter	0.898
22	professor	0.783	deutsche	0.948	exporting	0.927	72	booming	0.735	suisse	0.916	exxon	0.897
23	recommendations	0.782	gasoline	0.947	gasoline	0.923	73	audiences	0.735	automaker	0.916	uncharted	0.897
24	thick	0.782	traders	0.946	dampening	0.923	74	advocacy	0.734	tepid	0.915	chairmans	0.897
25	marked	0.780	nariman	0.946	pinch	0.922	75	mass	0.733	futures	0.915	soared	0.897
26	alter	0.779	discounting	0.945	oils	0.922	76	remarkable	0.733	geopolitical	0.915	conocophillips	0.896
27	sounds	0.776	behravesh	0.944	soaring	0.922	77	breaking	0.732	record	0.914	clamping	0.895
28	hole	0.776	retailers	0.943	exported	0.920	78	facts	0.732	yergin	0.914	exporters	0.895
29	peril	0.775	barrel	0.942	reidy	0.919	79	constituents	0.731	clamping	0.914	bps	0.895
30	extremely	0.771	heating	0.942	output	0.919	80	isolated	0.730	retail	0.914	crimp	0.895
31	avoided	0.770	oils	0.942	exporter	0.917	81	vibrant	0.703	hess	0.913	cutback	0.894
32	loose	0.770	shocks	0.941	easing	0.917	82	unequivocal	0.730	pinch	0.912	global	0.894
33	multi	0.769	idled	0.941	putins	0.917	83	recommended	0.729	chairmans	0.911	pretax	0.893
34	appear	0.767	jolted	0.941	record	0.916	84	unprotected	0.728	closings	0.911	disrupted	0.893
35	devastating	0.766	output	0.940	tumbling	0.916	85	inundated	0.727	depository	0.910	liquefied	0.892
36	draft	0.764	peaks	0.937	demand	0.915	86	ears	0.726	disrupted	0.909	premcor	0.892
37	possibility	0.764	profits	0.936	downers	0.915	87	exuberant	0.725	winter	0.909	jumped	0.891
38	roiled	0.759	soared	0.936	automaker	0.913	88	greenhouse	0.725	sunoco	0.909	mobil	0.891
39	retracted	0.758	exported	0.936	heating	0.913	89	powers	0.725	chevron	0.908	arabica	0.890
40	mismanagement	0.758	premcor	0.935	disruptions	0.913	90	alarms	0.724	doha	0.908	bros	0.890
41	plot	0.757	disruptions	0.934	atm	0.911	91	comment	0.723	bros	0.907	mercantile	0.890
42	produced	0.757	exporter	0.934	tepid	0.911	92	brokers	0.722	commodity	0.907	analyst	0.887
43	becomes	0.755	easing	0.933	chevrons	0.911	93	deny	0.722	commodities	0.906	gas	0.887
44	decades	0.753	crimp	0.932	jolted	0.911	94	pianos	0.722	wholesalers	0.905	geopolitical	0.886
45	consider	0.752	dent	0.932	embargo	0.909	95	baker	0.721	refiner	0.905	interruptions	0.886
46	wealthier	0.752	demand	0.932	pricing	0.909	96	ethnic	0.720	soar	0.903	squeeze	0.886
47	dismissed	0.751	roasters	0.930	roasters	0.908	97	cyclical	0.720	analyst	0.903	chevron	0.885
48	repeated	0.751	tightness	0.930	dent	0.908	98	relieve	0.720	products	0.903	crude	0.885
49	delays	0.750	atm	0.929	production	0.908	99	studies	0.720	bps	0.903	nations	0.884
50	unique	0.749	pricing	0.929	barrel	0.908	100	spread	0.720	thurtell	0.902	derivatives	0.884

Table 6 Results of LSA for Hurricane Sandy for 3 different queries. Words are ordered based on their cosine distance from the query vector. Includes the 100 words most similar to the query.

	"climate"	Similarity	"energy"	Similarity	"climate, energy"	Similarity		"climate"	Similarity	"energy"	Similarity	"climate, energy"	Similarity
1	climate	1.000	energy	1.000	climate	0.979	51	fuels	0.895	extracted	0.862	deniers	0.906
2	change	0.963	technologies	0.949	warmer	0.961	52	kerry	0.894	abundance	0.860	vigil	0.904
3	reduce	0.957	fuels	0.946	georgetown	0.956	53	hydroelectric	0.893	tackle	0.860	proportion	0.904
4	warming	0.957	fossil	0.943	warming	0.955	54	pollute	0.893	regulating	0.858	targets	0.902
5	reducing	0.956	hydroelectric	0.936	reduce	0.955	55	technologies	0.891	outweigh	0.858	mover	0.901
6	pressures	0.952	renewable	0.932	energy	0.952	56	altering	0.890	envisioned	0.857	scientists	0.899
7	georgetown	0.947	rogue	0.932	reducing	0.951	57	regulating	0.890	miserably	0.856	automobiles	0.899
8	lowering	0.943	employing	0.921	pressures	0.948	58	mover	0.889	subtler	0.856	devise	0.898
9	talks	0.942	warmer	0.920	fossil	0.947	59	believing	0.886	upending	0.855	controlling	0.898
10	devise	0.938	supplying	0.918	fuels	0.946	60	enhancement	0.885	pollution	0.855	modification	0.896
11	expands	0.938	firing	0.913	change	0.946	61	planets	0.885	solar	0.855	trillions	0.895
12	outweigh	0.937	efficiency	0.911	technologies	0.945	62	eco	0.883	modification	0.855	scenarios	0.893
13	warmer	0.937	streamlined	0.911	coal	0.943	63	cities	0.882	sciences	0.854	earths	0.893
14	plants	0.934	generating	0.908	global	0.942	64	automobiles	0.882	automobiles	0.853	abundance	0.891
15	drought	0.933	altering	0.906	hydroelectric	0.941	65	greenhouse	0.880	regulatory	0.852	attribute	0.890
16	manipulation	0.929	coal	0.906	emissions	0.940	66	notoriously	0.879	trapping	0.851	greenhouse	0.888
17	emissions	0.929	consumption	0.900	firing	0.937	67	strict	0.878	surprises	0.850	enhancement	0.887
18	global	0.929	adapt	0.898	outweigh	0.936	68	porous	0.878	earths	0.849	doom	0.886
19	imperative	0.927	sparked	0.895	generating	0.933	69	groundwater	0.878	measured	0.848	funneling	0.885
20	arizona	0.924	dimming	0.894	carbon	0.930	70	consumption	0.877	mover	0.847	groundwater	0.885
21	attribute	0.923	georgetown	0.892	arizona	0.930	71	modification	0.876	waterkeeper	0.846	hotter	0.884
22	scientists	0.923	carbon	0.889	editorials	0.929	72	hotter	0.876	change	0.845	copenhagen	0.884
23	planet	0.920	masonry	0.888	plants	0.927	73	earths	0.875	deniers	0.843	oceans	0.883
24	pollution	0.919	global	0.886	humanitys	0.926	74	markedly	0.875	sub	0.843	windstorms	0.883
25	curbing	0.918	erratic	0.885	altering	0.926	75	retaining	0.875	blackouts	0.843	planets	0.881
26	coal	0.917	searchable	0.884	manipulation	0.924	76	attests	0.875	manipulation	0.842	emission	0.881
27	editorials	0.915	faster	0.882	pollution	0.923	77	dimming	0.875	depleting	0.841	munich	0.881
28	targets	0.914	emissions	0.881	employing	0.923	78	employing	0.874	funneling	0.841	rogue	0.880
29	oceans	0.912	skeptics	0.880	drought	0.922	79	proportion	0.873	curbing	0.841	markedly	0.878
30	vigil	0.912	proportion	0.877	extracted	0.921	80	efficiency	0.873	plants	0.841	pollute	0.878
31	scenarios	0.911	trillions	0.876	foretaste	0.920	81	depleted	0.873	sources	0.841	ozone	0.878
32	extracted	0.911	foretaste	0.876	skeptics	0.919	82	exemplified	0.872	frequent	0.841	depleting	0.877
33	humanitys	0.911	warming	0.875	lowering	0.919	83	murky	0.872	oil	0.841	epa	0.877
34	distraction	0.910	reduce	0.875	dioxide	0.918	84	sparked	0.870	planet	0.839	overheated	0.877
35	pentagon	0.910	editorials	0.875	efficiency	0.918	85	essay	0.870	emission	0.838	contiguous	0.877
36	contiguous	0.909	humanitys	0.875	planet	0.917	86	atmospheric	0.869	ozone	0.837	frequent	0.876
37	controlling	0.908	eco	0.875	curbing	0.917	87	overheated	0.869	pentagon	0.836	sensible	0.874
38	carbon	0.907	ton	0.874	consumption	0.915	88	copenhagen	0.869	windstorms	0.836	freely	0.872
39	dioxide	0.906	efficient	0.872	expands	0.914	89	fahrenheit	0.868	acceptance	0.836	kerry	0.871
40	extremes	0.905	cities	0.872	subtler	0.913	90	energy	0.868	buildup	0.835	ton	0.870
41	munich	0.903	doom	0.870	dimming	0.912	91	adapt	0.868	copenhagen	0.835	fahrenheit	0.870
42	firing	0.902	compounding	0.869	talks	0.911	92	windstorms	0.867	focuses	0.835	exemplified	0.869
43	subtler	0.902	mentioning	0.868	sparked	0.910	93	funneling	0.867	vein	0.834	persistence	0.869
44	foretaste	0.900	climate	0.868	pentagon	0.909	94	illustrative	0.866	epa	0.834	atmospheric	0.869
45	generating	0.899	reducing	0.867	eco	0.909	95	vapor	0.866	drought	0.833	environmental	0.866
46	environmental	0.899	pressures	0.866	adapt	0.909	96	abundance	0.864	harvard	0.832	increasing	0.865
47	fossil	0.899	arizona	0.864	imperative	0.908	97	prosperity	0.864	redundant	0.832	levi	0.865
48	deniers	0.898	candlelit	0.863	trapping	0.908	98	freely	0.863	greenhouse	0.829	meaningfully	0.864
49	trapping	0.897	dioxide	0.862	cities	0.907	99	emission	0.862	temperature	0.827	porous	0.863
50	skeptics	0.896	degrees	0.862	regulating	0.906	100	scientific	0.862	iron	0.826	essay	0.862

Table 7 A 30 topic LDA model for Hurricane Katrina. Each topic contains the 20 most probable (stemmed) words in its distribution. We stem words according to a Porter stemmer Porter (1980).

				Hurricane Katrina LDA					
topic 0	topic 1	topic 2	topic 3	topic 4	topic 5	topic 6	topic 7	topic 8	topic 9
quinn	leve	job	hous	billion	polic	bush	bodi	price	school
team	corp	hous	water	tax	casino	presid	death	oil	student
season	engin	krt	home	feder	offic	democrat	offici	percent	univers
time	flood	st	street	hous	peopl	republican	state	energi	tulan
player	water	home	time	senat	street	hous	home	gas	colleg
play	canal	antoin	day	congress	day	polit	die	gasolin	educ
game	protect	back	peopl	cut	depart	white	victim	rate	back
coach	wall	school	back	republican	fire	administr	peopl	market	campus
start	system	restaur	tree	spend	citi	senat	famili	week	return
point	louisiana	peopl	live	bill	biloxi	respons	parish	product	high
open	armi	work	boat	budget	hotel	govern	st	month	district
make	offici	month	resid	govern	crime	nation	louisiana	consum	enrol
made	surg	worker	work	money	store	american	identifi	report	public
day	feet	louisiana	build	program	reddick	time	morgu	economi	class
sign	project	day	neighborhood	state	water	leader	relat	compani	warm
top	level	live	damag	propos	time	critic	coron	increas	research
week	pump	chitrib	roof	cost	back	peopl	dr	gulf	time
score	lake	rebuild	photograph	bush	gambl	iraq	dead	fuel	hurrican
world	design	end	flood	plan	mississippi	parti	found	expect	teacher
lead	environment	return	photo	million	hous	effort	remain	gallon	institut
topic 10	topic 11	topic 12	topic 13	topic 14	topic 15	topic 16	topic 17	topic 18	topic 19
peopl	leve	red	famili	gras	game	music	town	peopl	ship
black	hous	cross	home	mardi	team	jazz	plan	time	airlin
king	flood	donat	children	french	saint	band	build	american	show
time	protect	relief	day	restaur	play	musician	develop	disast	news
west	rebuild	organ	live	parad	season	art	school	news	time
mayor	home	volunt	back	street	home	cultur	hous	report	northrop
day	system	victim	school	back	footbal	museum	state	world	network
presid	feder	fund	mother	peopl	player	perform	design	stori	travel
polit	work	peopl	friend	quarter	coach	play	communiti	book	air
bloomberg	offici	million	peopl	time	state	festiv	resid	nation	nbc
democrat	peopl	chariti	im	home	time	artist	architect	thing	million
campaign	hotel	disast	call	day	leagu	song	board	public	broadcast
franklin	state	american	hous	citi	stadium	work	meet	word	report
candid	neighborhood	money	stay	make	giant	show	public	natur	abc
ferrer	engin	group	time	club	san	time	local	day	cruis
poll	corp	rais	dont	louisiana	back	concert	street	govern	program
hop	powel	effort	work	cook	bowl	includ	architectur	media	film
made	billion	food	life	krew	louisiana	orchestra	project	great	channel
hip	busi	org	son	hotel	field	event	urban	make	televis
dont	krt	shelter	left	celebr	win	record	peopl	histori	navi
topic 20	topic 21	topic 22	topic 23	topic 24	topic 25	topic 26	topic 27	topic 28	topic 29
compani	insur	peopl	hospit	guard	nagin	evacu	state	hous	fema
busi	flood	church	patient	nation	neighborhood	water	car	evacue	respons
work	damag	black	health	state	resid	peopl	charg	fema	feder
employe	billion	massachusett	medic	militari	black	offici	law	peopl	agenc
million	state	state	nurs	troop	mayor	resid	court	offici	brown
contract	compani	poverti	care	offici	citi	louisiana	vehicl	home	disast
servic	loss	work	dr	bush	rebuild	rita	investig	houston	govern
worker	mississippi	romney	center	unit	white	area	offic	feder	emerg
bank	home	poor	doctor	forc	peopl	flood	attorney	agenc	secur
custom	homeown	american	peopl	feder	elect	coast	lawyer	hotel	offici
week	pay	evacue	evacu	louisiana	home	state	louisiana	trailer	homeland
oper	claim	servic	state	equip	vote	texa	case	famili	hous
port	cost	communiti	flu	effort	hous	center	judg	state	depart
system	allstat	job	emerg	day	area	wind	report	shelter	report
execut	area	base	staff	relief	flood	emerg	fraud	emerg	manag
line	properti	day	home	presid	return	gulf	station	live	chertoff
area	louisiana	time	day	respons	plan	day	feder	month	white
damag	industri	live	die	blanco	percent	home	offici	apart	bush
small	feder	worker	diseas	disast	lower	houston	file	govern	plan
call	polici	nation	univers	rescu	landrieu	mile	system	assist	investig

Table 8 A 20 topic LDA model for Hurricane Sandy. Each topic contains the 20 most probable words in its distribution. We stem words according to a Porter stemmer Porter (1980).

					Hurricane Sandy LDA				
topic 0	topic 1	topic 2	topic 3	topic 4	topic 5	topic 6	topic 7	topic 8	topic 9
power	obama	climat	hous	school	broadway	park	train	hospit	insur
util	romney	flood	home	time	street	tree	author	home	compani
servic	presid	chang	water	fund	theater	boardwalk	station	patient	percent
compani	campaign	protect	beach	peopl	time	jersey	line	health	sale
author	elect	build	car	day	work	damag	servic	medic	month
electr	state	rise	live	student	open	fire	tunnel	nurs	market
island	republican	sea	flood	children	perform	seasid	jersey	evacu	busi
custom	vote	water	peopl	public	peopl	shore	gas	emerg	increas
state	polit	risk	point	famili	day	busi	transport	center	million
system	governor	level	fire	american	show	height	power	dr	loss
grid	voter	energi	street	red	week	summer	damag	peopl	industri
long	day	natur	rockaway	donat	power	town	subway	citi	home
verizon	poll	power	back	case	run	time	street	offici	report
nation	democrat	weather	day	work	danc	beach	manhattan	resid	expect
work	peopl	develop	insur	cross	play	work	offici	island	billion
phone	debat	make	damag	govern	light	pier	transit	day	rate
commiss	candid	cost	resid	live	night	island	long	care	week
network	presidenti	state	work	disast	cancel	stand	system	bird	retail
con	time	plan	famili	parent	halloween	back	day	mayor	consum
edison	nation	surg	neighborhood	relief	close	visit	island	mold	claim
topic 10	topic 11	topic 12	topic 13	topic 14	topic 15	topic 16	topic 17	topic 18	topic 19
museum	hous	wind	show	peopl	concert	feder	water	beach	build
art	water	power	time	home	perform	billion	system	sand	street
work	peopl	day	stewart	live	ticket	state	state	island	develop
galleri	build	close	peopl	hous	music	hous	million	park	apart
water	resid	weather	make	water	show	aid	flood	dune	properti
street	home	coast	photo	hotel	million	disast	plant	long	million
damag	volunt	expect	live	day	money	money	cost	offici	floor
flood	food	servic	twitter	polic	benefit	program	car	rockaway	estat
space	day	travel	call	work	hall	damag	occupi	corp	water
center	work	area	work	resid	rais	govern	sewag	project	manhattan
compani	power	offici	news	famili	song	republican	river	debri	flood
build	live	peopl	stori	apart	peopl	jersey	peopl	town	resid
seaport	red	state	includ	time	night	million	dutch	home	real
includ	island	damag	inform	island	work	congress	project	resid	owner
insur	apart	flood	magazin	door	relief	cuomo	build	communiti	squar
offic	week	nation	photograph	evacu	refund	senat	geotherm	sea	damag
artist	street	massachusett	design	call	springsteen	insur	work	day	tenant
aquarium	heat	center	post	worker	jersey	cost	park	boardwalk	month
site	brooklyn	report	print	staten	sale	offici	area	public	feet
research	hook	hour	page	report	band	homeown	engin	work	move

Table 9 A 100 word extension of selected topics from the Sandy and Katrina LDA models.

	Sandy Topic 0				Sandy Topic 2				Katrina Topic 8		
1	power	51	generat	1	climat	51	coastal	1	price	51	drop
2	util	52	solar	2	flood	52	bloomberg	2	oil	52	reserv
3	servic	53	spokesman	3	chang	53	public	3	percent	53	close
4	compani	54	voic	4	protect	54	barrier	4	energi	54	inflat
5	author	55	energi	5	build	55	part	5	gas	55	spend
6	electr	56	manag	6	rise	56	elev	6	gasolin	56	refin
7	island	57	emerg	7	sea	57	presid	7	rate	57	august
8	custom	58	liberti	8	water	58	system	8	market	58	depart
9	state	59	local	9	risk	59	map	9	week	59	natur
10	system	60	respons	10	level	60	gas	10	product	60	chief
11	grid	61	governor	11	energi	61	vulner	11	month	61	job
12	long	62	prepar	12	natur	62	disast	12	consum	62	end
13	verizon	63	feder	13	power	63	peopl	13	report	63	septemb
14	nation	64	copper	14	weather	64	fuel	14	economi	64	profit
15	work	65	govern	15	develop	65	event	15	compani	65	feder
16	phone	66	rate	16	make	66	polici	16	increas	66	gain
17	commiss	67	problem	17	cost	67	step	17	gulf	67	retail
18	network	68	regul	18	state	68	zone	18	fuel	68	record
19	con	69	link	19	plan	69	damag	19	expect	69	interest
20	edison	70	cost	20	surg	70	live	20	gallon	70	damag
21	day	71	percent	21	nation	71	effect	21	cent	71	share
22	restor	72	backup	22	warm	72	unit	22	barrel	72	rais
23	public	73	report	23	infrastructur	73	coast	23	higher	73	term
24	communic	74	investig	24	global	74	research	24	stock	74	demand
25	million	75	damag	25	increas	75	agenc	25	economist	75	futur
26	worker	76	chief	26	citi	76	recent	26	quarter	76	billion
27	execut	77	elli	27	reduc	77	long	27	econom	77	level
28	cuomo	78	ed	28	carbon	78	generat	28	high	78	declin
29	offici	79	wireless	29	environment	79	heat	29	cost	79	hit
30	employe	80	carrier	30	scientist	80	effort	30	suppli	80	investor
31	batteri	81	presid	31	billion	81	rais	31	day	81	survey
32	offic	82	hit	32	engin	82	pollut	32	analyst	82	state
33	oper	83	counti	33	studi	83	industri	33	refineri	83	remain
34	week	84	general	34	time	84	project	34	nation	84	effect
35	call	85	consum	35	resili	85	standard	35	industri	85	hurrican
36	time	86	consolid	36	futur	86	code	36	time	86	impact
37	charg	87	equip	37	emiss	87	hit	37	rose	87	heat
38	provid	88	director	38	area	88	issu	38	point	88	credit
39	plan	89	issu	39	govern	89	ocean	39	rise	89	labor
40	includ	90	cabl	40	feet	90	oyster	40	fell	90	servic
41	pay	91	critic	41	requir	91	design	41	fed	91	american
42	wire	92	cellphon	42	higher	92	larg	42	averag	92	continu
43	statu	93	technolog	43	mayor	93	offici	43	trade	93	unit
44	failur	94	run	44	extrem	94	warn	44	million	94	show
45	home	95	caus	45	propos	95	face	45	growth	95	produc
46	line	96	telephon	46	high	96	east	46	index	96	note
47	board	97	substat	47	plant	97	sever	47	yesterday	97	petroleum
48	panel	98	guard	48	includ	98	univers	48	sale	98	earn
49	hour	99	place	49	insur	99	decad	49	crude	99	concern
50	area	100	chairman	50	world	100	solut	50	coast	100	import