National Oceanic and Atmospheric Administration Oceanic and Atmospheric Research

CHEMICAL SCIENCES LABORATORY

Annual Operating Plans and R2X 2015 – 2020





ESRL-CSD FY16 Annual Operating Plan

DOC Strategic Plan Objective	5-Year Research Plan Goal:	NOAA Annual Guidance Memo	NGSP Goal: Objective (if applicable)	OAR Strategic Plan	Pr (NOTE: Do not report Measure	erformance • or Milestone Targets in the same row)										(NOTE: I	N Do not report	Aeasure or M Measure or	ilestone Targ Milestone Tar	ets gets in the s	ame row)							PRI	IARY RESPONS	вштү		
(if applicable)	Objective - Target	Priority					Select	any	y Cumulative re Across Years			Ac	ctuals			Target	Target	Target	Target	Target	Target	Target	Target		1	argets		Unit within LO/SO	Point of Contact	Responsible SES	NOAA Region	
Please use the pull- down menu to seled the objective	Please use the pull- down menu to select the objective	Please use the pull- down menu to select the objective	Please use the pull- down menu to select the objective	Please use the pull- down menu to select the objective	Measure (The monitoring of ongoing progress toward pre-established goals.)	Milestone (A distinct activity planned for completion on a scheduled date)	3PR.A APG	00C Strategic Plan	Quarterl Cum ulativ	10	11	12	13	14	15	16 Q1	16 Q2	16 Q3	16 Q4	17 Q1	17 Q2	17 Q3	17 Q4	18	19	20 2	1 22					
	Climate: Improve understanding - Assess Natural Variability	Resilence: Advance earth system & ecosystem models (OAR)	Climate_Scientific	Stakeholder: Communicating science	Cumulative number of ESRL-CSD articles published in the peer-reviewed literature.				×	n/a	54 :	123 2	200 :	305					470	0	0	0	505	540	575	610 64	15 680	ESRL-CSD	Eric Williams	David W. Fahey		These publications i stakeholders and de
	Weather: Improved predictive guidance Improve air quality modeling	Resilence: Advance earth system & ecosystem models (OAR)	Weather_AWQuality	Stakeholder: Communicating science	Cumulative number of reports to stakeholders and decision-makers that provide a policy-relevant scientific synthesis of results from intensive field studies, process studies, and analyses.				×	n/a	n/a	1	2	5		0	0	0	6	0	0	0	7	7	7	8 8	3 9	ESRL-CSD	Eric Williams	David W. Fahey		CSD reports provide precursors, species emission mana
	Weather: Improved predictive guidance Improve air quality modeling	Resilence: Advance earth system & ecosystem models (OAR)	Weather_AWQuality	Stakeholder: Communicating science		Provide a policy-relevant scientific synthesis of results from the first phase of the Fire Influence on Regional and Global Environments Experiment (FIREX) program: controlled studies of emissions from selected biofuels	F 2																1					ESRL-CSD	Eric Williams	David W. Fahey		Provide to the fire
	Climate: Improve understanding of atmosphere - Evaluate effects of compounds	Resilence: Advance earth system & ecosystem models (OAR)	Climate_Services	Modeling: Improve quantitative prediction	Cumulative number of substances, proposed as replacements for stratospheric azone depleting industrial compounds (e.g., solvents; refrigerants) whose azone depleting potential (ODP) and greenhouse- warming potential (GWP) have been evaluated.				×	n/a	n/a	1	2	2		0	0	0	4	0	0	0	5	6	7	7 8	3 8	ESRL-CSD	Eric Williams	David W. Fahey		Provides to indu
	Climate: Improve understanding of atmosphere - Evaluate effects of compounds	Resilence: Advance earth system & ecosystem models (DAR)	Climate_Services	Modeling: Improve quantitative prediction		Evaluation of climate-related properties of one chemical compound proposed as a replacement for ozone-depleting substances													1				1					ESRL-CSD	Eric Williams	David W. Fahey		Provides to indu
	Climate: Improve understanding of atmosphere - Quantify emissions	Resilence: Advance earth system & ecosystem models (OAR)	Climate_Scientific	Modeling: Improve quantitative prediction	Cumulative number of emission sources and source regions whose inventories have been evaluated for accuracy via top-down analyses				×	n/a	n/a N Bas	New seline	1	2		0	0	0	3	0	0	0	3	4	4	5 5	5 6	ESRL-CSD	Eric Williams	David W. Fahey		Provides verificat
	Climate: Improve understanding of atmosphere - Quantify emissions	Resilence: Advance earth system & ecosystem models (OAR)	Climate_Scientific	Modeling: Improve quantitative prediction		Top-down evaluation of greenhouse gas emissions inventories from the Shale Oil and Natural Gas NEXus (SONGNEX) mission and compare to previous data (SENEX)							Dela F	yed to Y16					1									ESRL-CSD	Eric Williams	David W. Fahey		Use SENEX and SOM
	Climate: Obs - Integrate into short and long time scale models	Resilence: Advance earth system & ecosystem models (OAR)	Climate_Scientific	Data: Environmental Data	Cumulative number of intensive field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of atmospheric chemical and physical processes				x	n/a	n/a i	n/a r	n/a N ba:	lew seline		0	0	0	1	0	0	o	2	3	3	4 4	5	ESRL-CSD	Eric Williams	David W. Fahey		Provides observa advanced scien
	Climate: Improve understanding of atmosphere - Quantify emissions	Resilence: Advance earth system & ecosystem models (OAR)	Weather_AWQuality	Data: Environmental Data		Plan and execute the first phase of the Fire Influence on Regional and Global Environment: Experiment (FIREX): measure emissions from biofuels in a controlled environment (USFS Fire Lab in Missoula, MT)	2													1								ESRL-CSD	Eric Williams	David W. Fahey		Utilize state-of-tl southea
	Climate: Key impacts - Advance activities focused on impacts of climate	Resilence: Advance earth system & ecosystem models (OAR)	Climate_Scientific	Data: Environmental Data		Participate in an additional activity of the Fire Influence on Regional and Global Environment: Experiment (FIREX): conduct field measurement of biomass burning emissions at the high- elevation Storm Peak Laboratory	: 5																1					ESRL-CSD	Eric Williams	David W. Fahey		Utilize state-of-the the
	Weather: Improved predictive guidance Improve air quality modeling	Resilence: Advance earth system & ecosystem models (OAR)	Weather_AWQuality	Data: Environmental Data	Cumulative number of studies, using field measurements and modeling, that focus on boundary-layer transport, structure, and processes that affect atmospheric composition.				x	n/a	n/a	n/a i	n/a i	n/a		New baseline	0	0	1	0	0	0	1	2	3	3 4	4	ESRL-CSD	Eric Williams	David W. Fahey		Conduct ob instrumentatio processes, includin
	Weather: Improved predictive guidance Improve air quality modeling	Resilence: Advance earth system & ecosystem models (OAR)	Weather_AWQuality	Weather: Atmospheric		Plan and execute a ground-based ozone lidar study in the San Joaquin Valley of California - California Baseline Ozone Transport Study (CaBOTS)												1										ESRL-CSD	Eric Williams	David W. Fahey		Investigate the v using the mobile
	Engagement: Improve understanding of stakeholders - Create mechanisms to collaborate	Org Excellence: People, teams, and tools (DUS-O)	OA_Workforce	Stakeholder: Communicating science	Number of Postsecondary Students in Higher Education Programs					0	0	0	5	9		0	0	0	2				2	2	2	2 2	2 2	ESRL-CSD	Eric Williams	David W. Fahey		
	Engagement: Improve understanding of stakeholders - Create mechanisms to collaborate	Org Excellence: People, teams, and tools (DUS-O)	OA_Workforce	Stakeholder: Communicating science	Number of Postsecondary Degrees in Higher Education Programs					0	0	0	1	0		0	0	0	0	0	0	0	2	0	0	0 0	0 0	ESRL-CSD	Eric Williams	David W. Fahey		

PERFORMANCE MEASURE and MILESTONE DESCRIPTIONS

inform the scientific community of CSD research results and advance scientific understanding. They provide the information needed by ecision-makers to develop effective policies and adaptation and mitigation strategies for 1) a changing climate, 2) improving air quality, and 3) stratospheric ozone layer recovery. e a distillation of key scientific findings on emissions, transport, atmospheric processing, and impacts of climate forcing agents and their related to air quality degradation, and compounds important for stratospheric ozone layer recovery to inform policy development and agement strategies for climate, air quality, and the stratosphere. Stakeholders include Federal agencies, state and local air quality managers, and industry. ffects modeling community, including the USFS, a synthesis report of emissions from selected western and southeastern U.S. biofuel stry stakeholders critical information on climate impacts of proposed replacement stratospheric ozone depleting chemicals prior to manufacture. try stakeholders critical information on climate impacts of proposed replacement stratospheric ozone depleting chemicals prior to manufacture. on of key inputs to climate and air quality models resulting in reduced uncertainty in model outputs, which provides decision-m greater confidence in establishing policies and emission management strategies. GNEX data from flights over different oil and gas plays to evaluate emissions and trends and validate/update emissio methane and other compounds. tions, analyses, and interpretations of the current state of atm ospheric composition, changes and trends of atm ospheric constituents, tific understanding of atmospheric chemical and physical processes, and improved understanding of causes and impacts of changing atmospheric composition. e-art instruments (gas phase and aerosol) to characterize and quantify the emissions from selected biomass fuels in the western and stern U.S. Measurements will be conducted under controlled conditions at the USFS (USDA) Fire Laboratory in Missoula, MT. art instruments (gas phase and aerosol) to characterize the composition, transport, and transformations of emissions from wildfires i vestern U.S. Measurements will be conducted at the high-elevation Storm Peak Laboratory near Steamboat Springs, CO. bservations, analyses, and interpretations of the structure and dynamics of the atm ospheric boundary layer using state-of-the-art ion (Doppler lidar, demical, e.g., coone, lidar, etc.). Provide advanced scientific understanding of atm cospheric chemical and physical ng profiles of composition (chemical, aerosol, physical - 3D wind) and transport of atm cospheric constituents (com plex terrain, long-range, stratospheric, etc.). Develop and deploy new techniques and instrumentation. variability of ozone in the lowest 2 km above the San Joaquin Valley (SJV) during the late spring (May-June) and summer (July-August) TOPAZ ozone lidar. Ozone profiles will be provided to CA Air Resources Board modelers to evaluate background ozone contributions to surface ozone concentrations in the SJV.

ESRL-CSD FY16 R2X

				Lifecyd Move	e Phase d from			Lifecycl Mov	e Phase ed to		Target	Target	Target	Target			Targets	;		Date Completed					A clear statement of what condition must be	דץ (Choos	/pe of R2 e all appli	A cable)	Cost of R2X Transition
Identifier (Name of Parent Project)	Brief Description	Statement of intended purpose	Research	Development	Demonstration	Operations or Applications	Research	Development	Demonstration	Operations or Applications	16 Q1	16 Q2	16 Q3	16 Q4	17	18	19	20	21	and quarter the project will transition to operations / applications	OAR Point of Contact	OAR Responsible SES	OAR Contributing Partners	Customer	The statement of what conduct makes the second statement to have been made. This should be sufficient to allow a knowledgeable observer to evaluate whether the advancement has been achieved.	Operations	Commercial	Other	Funding amount to move the project into operations/ applications (Only the profile shift and NOT the total funding amount.)
SONGNEX	Plan and execute the Shale Oil and Natural Gas NEXus (SONGNEX) mission to study emissions from energy development activities in the U.S.		x					×						1						FY16/Q4	Eric Williams	David Fahey	ESRL/GSD ESRL/GMD GFDL CIRES/CU OMAO	State/Local AQ Mgrs USEPA Industry (possibly)	The transition to Application will be made when the results presented in the scientific synthesia document are incorporated by USEPA into updated inventories of emissions of species related to oil and gas development in various regions of the U.S. This will likely be the National Emissions Inventory (NEI) 2014, with probable release date in 2016.			x	\$500K (2 FTE)

ESRL-CSD FY17 Annual Operating Plan

DOC Strateg Plan Objectio	5-Year Research Plan Goal: • Objective -	NOAA Annual Guidance Memo	NGSP Goal: Objective	OAR Strategic Plan	Per (NOTE: Do not report Measure	rformance or Milestone Targets in the same row)		2												(NO	ITE: Do not re	Messure or Milestone Targets eport Messure or Milestone Targets in the same row)								PRIM	ARY RESPONS	IBILITY
(if applicabl	E) Target	Priority	(if applicable)				Select any	y Cumulative re Across Year			Actuals			Target	Actual	Target	Actual	Target	Actual	Target	Actual	Why was the target missed? When will the target be completed? What is the risk of missing the target?	Target	Target	Target	Target		Target:	s	Unit within LO/SO	Point of Contact	Respons
Please use th pull-down me to select th objective	Please use the nu pull-down menu to select the objective	Please use the pull-down menu to select the objective	Please use the pull-down menu to select the objective	Please use the pull-down menu to select the objective	Measure (The monitoring of ongoing progress toward pre-established goals.)	Milestone (A distinct activity planned for completion on a scheduled date)	GPRA APG DOC Strategic Plan	Quarteri	10 11	12	13 14	15	16	17 Q1	17 Q1	17 Q2	17 Q2	17 Q3	17 Q3	17 Q4	17 Q4		18 Q1	18 Q2	18 Q3	18 Q4	19	20 21	22 23			
	Climate: Improv understanding Assess Natural Variability	Advance earth system & ecosystem models (DAR)	Climate_Scientific	Stakeholder: Communicating science	Cumulative number of ESRL-CSD articles published in the peer-reviewed literature.			×	n/a 54	123	200 305	436	566	0	0	0	0	0	O	610	703					650	690	730 770	810 850	ESRL-CSD	Eric Williams	David 1 Fahe
	Weather: Improved predictive guidance - Improve air quality modeling	Resilence: Advance earth system & ecosystem models (OAR)	Weather_AWQua lity	Stakeholder: Communicating science	Cumulative number of reports to stakeholders and decision-makers that provide a policy- relevant scientific synthesis of results from intensive field studies, process studies, and analyses.			×	n/a n/a	1	2 5	6	6	0	0	0	0	0	O	7	7					8	9	9 10	10 11	ESRL-CSD	Eric Williams	David Fahe
	Weather: Improved predictive guidance - Improve air quality modeling	Resilence: Advance earth system & ecosystem models (OAR)	Weather_AWQua lity	Stakeholder: Communicating science		Provide a policy-relevant scientific synthesis of results from the first phase the Fire Influence on Regional and Glob Environments Experiment (FIREX) program: controlled studies of emission from selected biofuels	of bal													1	1	Delays in data analysis prevented fulfillment of this milestone; it will be evaluated for completion during FY18. To fulfill the requirement CSD will subsitute another synthesis document - Atmospheric Impacts of Oil and Gas Development in Texas - which was delivered to the Texas Commission on Environmental Quality during Q3 of PY17		1						ESRL-CSD	Eric Williams	David Fahe
	Climate: Improv understanding c atmosphere - Evaluate effects of compounds	Resilence: Advance earth system & ecosystem models (OAR)	Climate_Services	Modeling: Improve quantitative prediction	Cumulative number of substances, proposed as replacements for stratospheric ozone depleting industrial compounds (e.g., solvents; refrigerants) whose ozone depleting potential (ODP) and greenhouse-warming potential (GWP) have been evaluated.			x	n/a n/a	1	2 2	3	4	o	0	0	0	0	0	5	5					6	7	78	89	ESRL-CSD	Eric Williams	David Fahe
	Climate: Improv understanding o atmosphere - Evaluate effects of compounds	Resilence: Advance earth system & ecosystem models (OAR)	Climate_Services	Modeling: Improve quantitative prediction		Evaluation of climate-related propertie of one chemical compound proposed as replacement for ozone-depleting substances	es ; a													1	1					1				ESRL-CSD	Eric Williams	David Fahe
	Climate: Improv understanding o atmosphere - Quantify emissions	Resilence: Advance earth system & ecosystem models (OAR)	Climate_Scientific	Modeling: Improve quantitative prediction	Cumulative number of emission sources and source regions whose inventories have been evaluated for accuracy via top-down analyses			×	n/a n/a	New Baseline	1 2	2	3	0	0	0	0	0	O	3	3		0	0	0	4	4	5 5	66	ESRL-CSD	Eric Williams	David Fahe
	Climate: Obs - Integrate into short and long time scale model	Resilence: Advance earth system & ecosystem models (OAR)	Climate_Scientific	Data: Environmental Data	Cumulative number of intensive field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of atmospheric chemical and physical processes			x	n/a n/a	n/a	n/a New baselir	ne 1	1	O	0	0	0	0	O	2	2		0	0	0	3	3	4 4	55	ESRL-CSD	Eric Williams	David Fahe
	Climate: Improv understanding o atmosphere - Quantify emissions	Resilence: Advance earth system & ecosystem models (OAR)	Weather_AWQua lity	Data: Environmental Data		Plan and execute the first phase of the Fire Influence on Regional and Global Environments Experiment (FIREX): measure emissions from biofuels in a controlled environment (USFS Fire Lab Missoula MT)	e I in							1	1															ESRL-CSD	Eric Williams	David Fahe
	Climate: Key impacts - Advance activities focuse on impacts of climate	Resilence: Advance earth system & ecosystem models (OAR)	Climate_Scientific	Data: Environmental Data		Participate in an additional activity of the Fire Influence on Regional and Glob Environments Experiment (FIREX): conduct field measurements of biomas burning emissions at the high-elevatio Storm Peak Laboratory	if bal ss on													1	0	Funding to conduct measurements at the Storm Peak Lab was not available. This activity related to the FIREX mission will not occur and has been terminated.				1				ESRL-CSD	Eric Williams	David Fahe
	Weather: Improved predictive guidance - Improve air quality modeling	Resilence: Advance earth system & ecosystem models (OAR)	Weather_AWQua lity	Data: Environmental Data	Cumulative number of studies, using field measurements and modeling, that focus on boundary-layer transport, structure, and processes that affect atmospheric composition.			x	n/a n/a	n/a	n/a n/a	n/a	1	0	0	0	0	0	0	1	1					2	3	34	4 5	ESRL-CSD	Eric Williams	David Fahe
	Engagement: Improve understanding o stakeholders - Create mechanisms to collaborate	Org Excellence: People, teams, and tools (DUS-O)	OA_Workforce	Stakeholder: Communicating science	Number of Postsecondary Students in Higher Education Programs				0 0	O	5 9	2	2	0	0	0	0	0	O	2	2					1	o	0 0	0 0	ESRL-CSD	Eric Williams	David Fahe
	Engagement: Improve understanding o stakeholders - Create mechanisms to	Org Excellence: People, teams, and tools (DUS-O)	OA_Workforce	Stakeholder: Communicating science	Number of Postsecondary Degrees in Higher Education Programs				0 0	O	1 0	0	0	0	0	0	0	0	0	1	2	A University of Colorado graduate student who conducted her research at CSD received her Ph.D. degree in Q4.	o	0	0	1	0	0 0	0 0	ESRL-CSD	Eric Williams	David Fahe

		PERFORMANCE MEASURE and MILESTONE DESCRIPTIONS
ible	NOAA Region (if applicable)	
N.		These publications inform the scientific community of CSD research results and advance scientific understanding. They provide the information needed by stakeholders and decision-makers to develop effective policies and adaptation and mitigation strategie
N.		CSD reports provide a distillation of key scientific findings on emissions, transport, atmospheric processing, and impacts of climate forcing agents and their precursors, species related to air quality degradation, and compounds important for stratospheri
N.		Provide to the fire effects modeling community, including the USFS, a synthesis report of emissions from selected western and southeastern U.S. biofuels.
N.		Provides to industry stakeholders critical information on climate impacts of proposed replacement stratospheric ozone depleting chemicals prior to manufacture.
N.		Provides to industry stakeholders critical information on climate impacts of proposed replacement stratospheric azone depleting dhemicals prior to manufacture.
N.		Provides verification of key inputs to climate and air quality models resulting in reduced uncertainty in model outputs, which provides decision-makers greater confidence in establishing policies and emission management strategies.
N.		Provides observations, analyses, and interpretations of the current state of atmospheric composition, changes and trends of atmospheric constituents, advanced scientific understanding of atmospheric chemical and physical processes, and improved understand
N.		Utilize state-of-the-art instruments (gas phase and aerosol) to characterize and quantify the emissions from selected biomass fuels in the western and southeastern U.S. Measurements will be conducted under controlled conditions at the USFS (USDA) Fire lab
N.		Utilize state-of-the-art instruments (gas phase and aerosol) to characterize the composition, transport, and transformations of emissions from wildlines in the western U.S. Measurements will be conducted at the high-elevation Storm Peak Laboratory near St
N.		Conduct observations, analyses, and interpretations of the structure and dynamics of the atmospheric boundary layer using state-of-the- art instrumentation (Doppler lidar, chemical, e.g., ozone, lidar, etc.). Provide advanced scientific understanding of
N.		
N.		

ESRL-CSD FY17 R2X

				Lifecyc Move	le Phase ed from			Lifecy Mo	de Phase ved to		Target	Target	Target	Target	Actual	Why was the target missed? When will the target be completed? What is the risk of missing the target?			Targets	5		Date Completed					A clear statement of what condition must be	T (Choo	'ype of R2 se all appl	A icable)	Cost of R2X Transition
Identifier (Name of Parent Project)	Brief Description	Statement of intended purpose	Research	Development	Demonstration	Operations or Applications	Research	Development	Demonstration	Operations or Applications	17 Q1	17 Q2	17 Q3	17 Q4	17 Q4		18	19	20	21	22	and quarter the project will transition to operations applications	OAR Point of Contact	OAR Responsible SES	OAR Contributing Partners	Customer	met for the product advancement to have been made. This should be sufficient to allow a knowledgeable observer to evaluate whether the advancement has been achieved	Operations	Commercial	Other	Funding amount to move the project into operations/ applications (Only the profile shift and NOT the total funding amount.)
SONGNEX	Plan and execute the Shale Oil and Natural Gas NEXus (SONGNEX) mission to study emissions from energy development activities in the U.S.		×					x						1	0	Delays in incorporating CSD research results into next generation national emission inventories have occurred at USEPA. Completion date for this activity is unknown. CSD will reconsider this R2A activity for FY18						FY16/Q4	Eric William	David Fahey	ESRL/GSD ESRL/GMD GFDL CIRES/CU OMAO	State/Local AQ Mgrs USEPA Industry (possibly)	The transition to Application will be made when the results presented in the scientific synthesis document are incorporated by USEPA into updated inventories of emissions of species related to oil and gas development in various regions of the U.S. This w			x	\$500K (2 FTE)

ESRL-CSD FY18 Annual Operating Plan

OAR Corporate Priorities	OAR Corporate Priorities	OAR Strategic Plan	Perfor (NOTE: Do not report Measure or I	mance Milestore Targets in the same row)	2	sues 3	other Act										(NOTE: I	Mi Io not report I	asure or Mile leasure or Mil	stone Targets lectore Targets in th	e same row)								PRIMARY RE	SPONSIBILITY				PERFORMANCE MEASURE and MILISTONE DISCONFICING
Primary	Secondary §f applicable)	1			Ormale	A gross				Actua	als		Targe	Actua	Target	Actual	Target	Actual	Target	Adual		Target	Target	Target	Target	т	rgets	Unit wit	Sin Poli	t of Respon tact SE	Ible NDAA F	Region CI Pa	artner (2	
Rease use the pull- down menu to select the objective	Please use the pull- down menu to select the objective	Please use the pull- down menu to select the objective	Measure (The monitoring of ongoing progress toward pro-established gasis.)	Milestone (A distinct activity planned for completion on a scheduled date)	Quarterly	Greekeline	asar check he box if your asare/mil stoos is TRUE	30	11 12	13	54 5	15 16	17 18 Q1	18 Q1 TRUE	18 Q2	18 Q2 TRUE	18 Q3	18 Q3 TRUE	2 H	18 Q4 FALSE	When will the target be completed? What is the risk of missing the target?	19 Q1	8 8	a G	19 Q8	20 21	22 23	24			(f sppi	icable) app	plicable)	
Environmental info	Weather forecasting & climate predictions	Stakeholder: Communicating science	Annual number of ESR-CSD articles published in the peer- reviewed literature.		THE	P.6.18		n/a :	54 123	200	305 4	16 566	Dirwtas	line O	50	24	15	63	15	129					40	40 40	40 40	40 ESRL-CS	D Eric W	illiarns Fahe	N. r	Coop Instil Reso Enviro Science	perative itute for earch in ronmental ors (CRES)	These publications inform the scientific community of CSD research results and advance scientific understanding. They provide the information meetind by stakeholders and decision-makers to develop effective publics and adaptation and mitigation strategies.
R2A	Program Mgmt	Stakeholder: Communicating science	RDA Index Annual number of GAR RBD products transitioned to a new stage() (development, demonstration, or application).		78.6	PA.18	-						NewSase	lise			2	2							2	2 2	2 2	2 ESRL-CS	D Eric W	Illiams David Fahe	N. 1	Coop Insti Rese Enviro Science	perative itute for earch in ronmental ces (CIRES)	
Environmental info	Weather forecasting & climate predictions	Stakeholder: Communicating science	Annual completion rate (percent) of stakeholder-supported scientific research activities (Le., MOAs, MOU) that require laboratory studies, field studies, modeling, and analysis to provide actionable scientific information needed by those stakeholders.		P&.12	74.18	-	n/a r	n/a 1	2	s	د د	NewSase	ine	۰	۰	٥	۰	100	50	The FAST-UVOS draft report has been delayed due to additional QA/QC on the data collected during the field experiment. The current target is Q2 F192. Clark County officials have agreed to this electrosis, so there is no risk in missing this target.				100	100 100	100 100 1	00 ESRL-CS	D Eric W	Illams David Fahe	N. Y	Coop Insti Reso Enviro Science	perative itute for earch in ronmental ces (CIRES)	30 active that balandarin § 4, it as if gaining districtly is enough agreement where is abandaries provide facing to COL gains and encours removes hardbarns with the gain of darkining is a standardistic most by active at range on emission, runnaport, atmospheric provening, and impacts of 10 instruction for the gardeness and their personance 3 gardeness and standardistic and the gardeness. The standard standardistic and the standardistic and the sciences measures tables to all excited the standardistic and the standardistic and the standardistic and the sciences environmental lastice and and the standardistic and the standardistic and the standardistic and the sciences environmental lastice and and an advect and advect and advect and advect and advect and the production environmental lastice and and and advect advect and advect and advect and advect and advect environmental lastice and and a standard advect advect advect advect advect advect advect environmental lastice and and advect adve
Environmental info	Weather forecasting & climate predictions	Stakeholder: Communicating science		MOU DELVERABLE: Provide a report of results from the URah Wetter Fine Particle Study which the URah Department of Air Quality will use to formulate measures to control writer time particulate pollution in the Salt Lake City region.			-	76.52 73	ilist Allis	PALIE	74.32 7A	ur paur	438 PA18	74.9	78.98	74.9	76.0	76.8	74.55	TRUE		raan.	78.0	78.0	ALLE	16.55 P.6.32	use pase p	A.34						Provide to the Utah Department of Air Quality scientific information they can use to formulate measures to control severe particle pollution levels during withertime is the Salt Lake City region.
Environmental info	Weather forecasting & climate predictions	Stakeholder: Communicating science		MOU DELVERABLE: Provide a report of results from the 2017 Fires, Aslan, and Stratospheric: Transport Law Vegas Doone Study (IFAST 4VDD) which the Clark County, NV, Department of Air Quality will use to formulate exerptional event represents to violations of air quality atandards.			I	76.52 73	ilist Allis	P46.38	74.32 7A	ur paur	438 PA18	74.9	78.98	74.18	78.8	78.9	74.55	FALSE		16.55	76.0	78.02	ALLE	16.55 P.6.38	use pase p	A.34						roule to the Cark, SW, Department of Air Quality useful colormation they can use to understand sources of high cases in the Las Vages region and to formalize exceptional event responses to volations of air quality standards.
Environmental info	Weather forecasting & climate predictions	Modeling: Improve quantitative prediction	Cumulative number of industrial compounds (e.g., refrigerants) that have been evaluated prior to large-scale manufacture for adverse effects on stratospheric assne and global warning.		P.6.10	76.8	PALLE	n/a r	√a 1	2	2	1 4	٥	٥	٥	٥	0	٥	6	6					7	7 8	8 9	9 ESRL-CS	D Eric W	illiarrs Fahe	N. Y	Coop Insti Reso Enviro Science	perative itute for earch in ronmental ces (CIRES)	Provides to industry stakeholders critical information on eavisonmental impacts of proposed industrial dremicals prior to manufactures.
Environmental info	Weather forecasting & climate predictions	Modeling: Improve quantitative prediction		Laboratory evaluation of adverse environmental properties (e.g., dimate-uanning) of one chemical compound proposed as a replacement air conditioning agent or refrigerant.			PALIE	74.10 N	11.12 ALL	FALLE	14.32 7.4	LIE PALIE	-	74.0	14.12	PAM	-	14.18	ŝ	TRUE		14.55	74.11	PAR	ALLE	au fau i	4.12 FA.12 F	A.17						Provides to industry stakeholders critical informations on environmental impacts of proposed industrial dhemicals prior to manufacture.
Weather forecasting & climate predictions	Environmental info	Data: Environmental Data	Cumulative number of field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of denical, physical, and dynamical percesses that influence atmospheric composition.		PAR	76.8	1	n/a r	n/a n/a	n/a b	New aselin : e		2 0	٥	٥	٥	٥	٥	4	4		٥	0	٥	s	s 6	6 7	7 ESRL-CS	D Eric W	illiarrs Fahe	N. 1	Coop Insti Reso Enviro Science	perative itute for earch in ronmental ces (CRES)	Provide deterministes, andyren, and interpretations of the current state of bismaphrics constructions, andyren, and interpretations of the construction of provide structures of a immunphric construction, advanced stretter (Construction) of physical streams, and improve parameterizations in numerical models. Provident verification of any leasts 14, of densitial constructions are salificities, and and providence, net (2) so dimite and all quality models multitige in moderal uncertainty is model streams, and many parameters, net (2) so dimite and all quality models multitige in moderal uncertainty is model separate, which provides detailormakant granters confidences in establishing policy and emissions.
Weather forecasting & climate predictions	Environmental info	Duta: Environmental Duta		Use a NDAA Twin Otter aircraft to measure with a newly- developed Doppler lidar instrument the three-dimensional wind fields near biomess burning plumes from coetrolled burns.			1	P&38 73	ant nase	P4634	*4.52 *4	LSE PALSE	4.18 P.4.18	74.0	74.5F	14.10	7964	THAT	PASE	FAISE	96.4	14.55	74.11	74.11	ALL R	16.55 P.6.58	use pase p	a.32						Social description, and/arc, and interpretations of the structure and dynamics of the attempted basedary layer asing data-di- tere at instrumentation (Dappier Line, dwniae), e.g., more, Line, e1(1). Provide advanced scattific advanceding of basedary layer transport passauss that induces making of policitants than they into the attempters.
Weather forecasting & climate predictions	Environmental info	Data: Environmental Data		Complete the fourth deployment of the Atmospheric Tomagraphy mission (pint with NASA and Harvard) which will provide an unprecedented data set of observations of the global background atmosphere in all seasons.			14.12	76.52 FI	ille Alle	P6638	**** **	.u. 74.18	4.12 P.4.12	74.0	74.18	74.12	TRUE	76.8	74.58	FAISE	964	14.55	74.0	P.8.12	ALLE	16.57 P.6.17	11.12 PA.12 P	A.34						Nowlege of the comparison of the background atmosphere is critical to understanding gobal cherical and dynamical processes that after air quarity and dimans. The Atmospheric Transgraphy (Nord (instance will use the MAA CE & aroant to by internetes to measure gas phase and amound species gibbally from the surface to the attracture in those deployments to exercise associal windows.
Weather forecasting & climate predictions	Environmental info	Data: Environmental Data		Fire influence on Regional and Global Environments Experiment (FIREQ) can the NGAK WP-3D aircraft to measure emissions and investigate devical processing of emission during downwind transport of plumes from validities in the U.S. pUOTI: this activity was deterred from F20218 to F2020 due to aircraft non- availability.]			ł	76.32 FI	ille Alle	P6.32	74.32 74	ur Paur	4.12 PA.12	74.0	TAUE	This activ is defern to FY19/ due to no availabil of NDAJ aircraft	ity nd Q4 po- FAIR ty A	74.92	74.98	FALSE		786.58	74.11	PAR	364	an fan i	11.12 PA.12 P	AU						USIse date-offee art indrummit (gas plan and seried) to duracterize the compaction, transport, not transformation of ensistent from wildless in the waters U.S. using an actioner platform
Workforce		Stakeholder: Communicating science	Number of Postsecondary Students in Higher Education Programs		P&.12	FAM	14.15	٥	0 0	5	9 :	2 2	٥	0	٥	٥	٥	۰	1	1					0	0 0	0 0	0 ESRL-CS	D Eric W	illiams David Fahe	N. Y	Coop Insti Reso Enviro Science	perative itute for earch in ronmental ces (CRES)	
Workforce		Stakeholder: Communicating science	Number of Postsecondary Degrees in Higher Education Programs		PAR	74.12	74.52	٥	• •	1	•	0 0	٥	٥	٥	٥	٥	1	1	1		٥	٥	٥	1	0 0	• •	0 ESRI-CS	D Eric W	Illiams David Fahe	N. 1	Coop Instit Reso Ensin Science	perative itute for earch in ronmental ces (CIRES)	

ESRL-CSD FY2018 R2X

				Lifecycl Move	le Phase d from			Lifecyd Mov	e Phase ed to		Target	Target	Target	Ac tual	Target			Targets				Date Completed						Ty (Choose	/pe of R2A e all applica	able)	Cost of R2A Transition
Identifier (Name of Parent Project)	Brief Description	Statement of intended purpose	Research	Development	Demonstration	Operations or Applications	Research	Development	Demonstration	Operations or Applications	18 Q1	18 Q2	18 Q3	18 Q3	18 Q4	19	20	21	22	23	Weather Act	and quarter the project will transition to operations / applications	OAR Point of Contact	OAR Responsible SES	OAR Contributing Partners	Customer	A Gear statement of what conduct must be met for the product advancement to have been made. This should be sufficient to allow a knowledgeable observer to evaluate whether the advancement has been achieved.	Operations	Commercial	Other	 unding amount to move the project into operations/ applications (Only the profile shift and NOT the total funding amount.)
UWFPS	Aircraft-based field mission to understand sources of high levels of particulate material in the Salt Lake City, UT, region in wintertime	Provide Utah Dep't of Air Quality scientific Information to remediate a major air quality concern	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	Early April Q3/FY2018	Eric Williams, ESRL/CSD	David Fahey; ESRL/CSD		Utah Department of Environment al Quality; Department of Air Quality	The final report, which is a deliverable in the contract with Utah, will be submitted to Utah DEQIn early April, 2018. Acceptance of this report will transition this research to information.	FALSE	FALSE	TRUE	\$100K (1/2 FTE)
NOy-CARDS	Commercialization of new technology developed by CSD scientists for research purposes. Patent has been issued; commercialization being pursued.	Develop smaller and lighter- weight instrumentation to measure atmospheric trace gases from aircraft.	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE		TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	Date unknown at this point, but likely early FY2019.	Eric Williams; ESRL/CSD	David Fahey; ESRL/CSD		Still under evaluation; possibly High Precision Devices in Boulder, CO	A commercial company to license this technology must be found and a CRADA or other vehide executed to take the technology to commercialization.	FALSE	TRUE	FALSE	\$100K (1/2 FTE)

ESRL-CSD FY19 Annual Operating Plan

D d'Ile et euro		IF 84	which the 2		Mappings													P	erformance	Targets and	Actuals									Primary Res	ponsibility
willestone	or weasure?	IF Measure,	which type?		Weather				Past /	Actuals				FY-19	9 Q1	FY-1	.9 Q2	FY-1	.9 Q3			FY-19 Q4		FY-20 Quart	terly Targets	5		Future Annual	argets		
Milestone	Measure	Quarterly	Cumulative	Performance Measure or Milestone	Act	FY-10	FY-11 FY	-12 FY-	-13 FY-	14 FY-1	5 FY-16	FY-17	FY-18	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Why was the target missed? When will the target be completed?	FY-20 Q1	FY-20 Q2	FY-20 Q3	FY-20 Q4	FY-21	FY-22 FY-23	FY-24 FY-25	Point of Contact	Responsible SES
		Cumulative	Across Years		TRUE									TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	What is the risk of missing the target?									
TRUE				Evaluation of dimate-related properties of one chemical compound proposed as a replacement for ozone-depleting substances	FALSE	FALSE	FALSE FA	LSE FAI	LSE FAI	SE FALSI	E FALSE	FALSE	FALSE	0	0	0	FALSE	1	1	0	FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE FALSE	FALSE FALSE	Eric Williams	David Fahey
TRUE				Analyze data from the 2017 Fires, Asian, and Stratospheric Transport Las Vegas Ozone Study and prepare a scientific synthesis for the Clark County, Nevada, Department of Air Quality	TRUE	FALSE	FALSE FA	LSE FAI	LSE FAI	SE FALSI	E FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE FALSE	FALSE FALSE	Eric Williams	David Fahey
TRUE				Fire Influence on Regional and Global Environments Experiment (FIREXAQ) joint with NASA: use the NASA DC-8 aircraft to measure emissions and investigate chemical processing of emissions during downwind transport of plumes from wildfires in the U.S. (NOTE: this activity was combined with NASA due to NOAA WP-3D aircraft non-availability.)	TRUE	FALSE	FALSE FA	LSE FAI	LSE FAI	SE FALSI	E FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE FALSE	FALSE FALSE	Eric Williams	David Fahey
TRUE				Use a NOAA Twin Otter aircraft to measure with a newly-developed Doppler lidar instrument the three-dimensional wind fields near biomass burning plumes from wildfires and controlled burns (FireWinds).	TRUE	FALSE	FALSE FA	LSE FAI	LSE FAI	SE FALSI	E FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE FALSE	FALSE FALSE	Eric Williams	David Fahey
TRUE				Use a NOAA Twin Otter aircraft to measure emissions and investigate chemical processing of emissions during downwind transport of plumes from wildfires (FireChem).	TRUE	FALSE	FALSE FA	LSE FAI	LSE FAI	.SE FALSI	E FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	TRUE		FALSE	FALSE	FALSE	FALSE	FALSE	FALSE FALSE	FALSE FALSE	Eric Williams	David Fahey
TRUE				Use a unmanned aerial system (UAS) to measure with newly-developed aerosol instruments the aerosol emissions from biomass burning plumes at night (NightFox).	FALSE	FALSE	FALSE FA	LSE FAI	LSE FAI	SE FALSI	E FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	This mission dependended on University of Colorado colleagues to provide the UAS, but they could not provide the UAS on time. The payload for the UAS was instead successfully flown on the NOAA Twin Otter aircraft along with the Doppiler lidar system (see above milestone).	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE FALSE	FALSE FALSE	Eric Williams	David Fahey
	TRUE	TRUE		Annual number of ESRL-CSD articles published in the peer-reviewed literature.	FALSE		54 1	23 20	00 30)5 436	566	New baseline	129	10	33	20	33	30	61	40	89		10	10	10	10	40	40 40	40 40	Eric Williams	David Fahey
	TRUE	TRUE		Annual completion rate (percent) of stakeholder supported scientific research activities (i.e., MOAs, MOUs, etc.) that require laboratory studies, field studies, modeling and analyses to provide actionable scientific information needed by stakeholders.	TRUE			1 2	2 5	6	6	New baseline	100	0	0	100	100	0	0	0	0		-	-	-	100	100	100 100	100 100	Eric Williams	David Fahey
	TRUE		TRUE	Cumulative number of controlled laboratory studies that evaluate industrial compounds (e.g., solvents; refrigerants) for adverse effects on stratospheric ozone and global warming prior to large-scale manufacture.	FALSE			1 2	2 2	3	4	5	6	0	0	0	0	7	7	0	0		-	-	-	8	8	9 9	10 10	Eric Williams	David Fahey
	TRUE		TRUE	Cumulative number of field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of chemical, physical, and dynamical processes that influence atmospheric composition.	TRUE				Ne Base e	w elin 1	1	2	4	0	0	0	0	0	0	8	8		-	-	-	8	9	9 10	10 11	Eric Williams	David Fahey
	TRUE	FALSE	FALSE	R2A Index	FALSE									0	0	1	1	1		0	0									Eric Williams	David Fahey

ESRL-CSD FY19 R2X

			Life	cycle Ph	ase		Lifecy	le Phas	e					FY-19 Targ	ets & Actuals	s						Fute	Tora	ata			Date					A clear statement of what condition		no of DOV		Cost of DOV Transition
Identifier			M	oving fro	m		Mo	ving to			FY-19 Q1			FY-19 Q2		F	FY-19 Q3			FY-19 Q4		Full	lie Ft laig	ets		E3	Completed			OAR		must be met for the product	- TYP	e of KZA		COST OF R2X Transition
(Name of Parent Project)	Brief Description	Statement of Intended Purpose	Research	Demonstration	Operations or	Applications Research	Development	Demonstration	Operations or Applications	Target Ad	Why was the t missed? When will the targ completed? What is the risk of m target?	rget et be tsing the	rget Acti	Why was the target missed? When will the target be completed? What is the risk of missing the target?	Target Act	tual Wł	Why was the target missed? When will the target be completed? Vhat is the risk of missing the target?	Target Ac	ctual	Why was the target missed? When will the target be completed? What is the risk of missing the target?	20	21	22	23	Wea A 24	ather (Act (c	quarter the OAR project will of Co transition to operations / applications	Point ntact e	AR onsibl SES	Contributi ng Partners	Customer	advancement to have been made. This should be sufficient to allow a knowledgeable observer to evaluate whether the advancement has been achieved.	Operations	Commercial	at an	Funding amount to move the project into operations/ pplications (Only the profile shift nd NOT the total funding amount.)
NOy-CARDS	Commercialization of new technology developed by CSD scientists for research purposes. Patent has been issued; commercialization being pursued with collaboration of TPO	Develop smaller and lightweight instrument to measure atmospheric trace gases from a ircraft platforms	FALSE FA	LSE TRI	JE FALS	ie Falsi	E FALSI	FALSE	TRUE	FALSE F	ALSE	FA	ALSE FAL	5E	TRUE C	laye in d d	lelease for sale of NOy-CARDS instrument by HPD has been delayed due to engineering problems; release date TBD	FALSE FA	FALSE		TRUE	TRUE	TRUE 1	TRUE TI	RUE FA	ALSE	Eric V	illiams Davi	l Fahey	TPO	High-Precision Devices; Boulder , CO	Customer determines market for instrument; builds and sells instruments	FALSE	TRUE FA	ILSE	\$20K
FAST-LVOS	Field mission using TOPAZ lidar to understand sources of ozone around Las Vegas, NV	MOU Deliverable: Provide atmospheric composition and boundary layer transport data to Clark County, NV, to meet national air quality standard for ozone	FALSE FA	LSE TRI	JE FALS	ie falsi	E FALSI	FALSE	TRUE	FALSE F	ALSE	т	RUE TRL	Final report submitted to Clari County. Additional analyses E requested and new agreemen under negotiation. Expected completion will be Q1/FY20	t FALSE FAI	ALSE		FALSE FA	FALSE		TRUE	TRUE	TRUE 1	TRUE TI	RUE TR	RUE	Eric V	illiams Davi	l Fahey	GFDL	Clark County, NV, Department of Air Quality	Customer will accept final report (MOU deliverable) and use information for exceptional event filings	FALSE	FALSE TF	RUE	\$100K

CSL FY20 Annual Operating Plan - Performance Measures

				Mapping			Past	Year					Cu	rrent Year R	eporting				F		1.7	•-	
Borformanco Moacuro	Description					OAR	Act	uals	FY-2	0 Q1	FY-2	0 Q2	FY-2	20 Q3			FY-20 Q4	1 /	Future	: Annual	Target	LS .	Boint of Contact
Penomance Weasure	Description	DOC SP	NOAA AOP	APPR	CI	Strategic Goal	FY-18	FY-19	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Why was the target missed? When will the target be completed? What is the risk of missing the target?	FY-21	FY-22	FY-23	FY-2	4 FY-25	Point of contact
Annual number of NOAA peer reviewed publications related to environmental understanding and prediction	The annual number of peer reviewed publications is an indicator of productivity and relevance and is tracked using on-line resources. Peer review is one of the important procedures used to ensure that the quality of published information meets the standards of the scientific and technical community.	TRUE	TRUE	TRUE	TRUE	Drive Innovative Science	129		10	37	10	32	10	39	10	33		40	40	40	40	40	Eric Williams
R2A Index: Annual number of OAR R&D products transitioned to a new stage(s) (development, demonstration, or application).	The measure captures the count of significant and discrete OAR research and development products that have transitioned to development, demonstration, or an application. Products include transitions occurring within OAR and applying group(s) outside of OAR. This includes research, development, and demonstration performed and supported by OAR as well as utilization of OAR R&D products by external parties	TRUE	TRUE	TRUE	TRUE	Drive Innovative Science			0	0	0	0	0	0	2	2							Eric Williams
Annual completion rate (percent) of stakeholder supported scientific research activities (i.e., MOAs, MOUs, etc.) that require laboratory studies, field studies, modeling and analyses to provide actionable scientific information needed by stakeholders.	CSL works with stakeholders (e.g., state air quality districts) to execute agreements wherein stakeholders provide funding for CSD to plan and execute research activities with the goal of delivering to stakeholders reports that provide a distillation of key scientific findings on emissions, transport, atmospheric processing, and impacts of 1) climate forcing agents and their precursors, 2) species and processes related to air quality degradation, 3) and compounds important for stratospheric ozone loss. Stakeholders do not have the resources to obtain the scientific information that NOAA can provide. This information is key for management of atmospheric environmental issues such as poor air quality, as well as for regulatory compliance.	FALSE	FALSE	FALSE	FALSE	Detect Changes in the Ocean and Atmosphere	100								100	100		100	100	100	100	100	Eric Williams
Cumulative number of controlled laboratory studies that evaluate industrial compounds (e.g., solvents; refrigerants) for adverse effects on stratospheric ozone and global warming prior to large-scale manufacture.	Provides to industry stakeholders critical information on environmental impacts of proposed industrial chemicals prior to manufacture.	FALSE	FALSE	FALSE	FALSE	Drive Innovative Science	6						8	8				9	10	10	10	10	Eric Williams
Cumulative number of field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of chemical, physical, and dynamical processes that influence atmospheric composition.	Provides observations, analyses, and interpretations of the current state of atmospheric composition, changes and trends of atmospheric constituents, advanced scientific understanding of atmospheric chemical and physical processes, and improved parameterizations in numerical models. Provides verification of key inputs (e.g., chemical reaction rate coefficients, emissions of pollutants and precursors, etc.) to dimate and air quality models resulting in reduced uncertainty in model outputs, which provides decision-makers greater confidence in establishing policies and emission management strategies.	FALSE	FALSE	FALSE	FALSE	Detect Changes in the Ocean and Atmosphere	4		8	7			9	9				10	11	11	12	12	Eric Williams

CSL FY20 Annual Operating Plan - Milestones

			Mapp	ing						Cu	rrent Year R	eporting			
						FY-2	0 Q1	FY-2	0 Q2	FY-2	0 Q3			FY-20 Q4	- · · · · · ·
Milestone	What performance measure does this contribute to, if any?	OAR Strategic	NOAA level AOP	O&M action	Lab / Program									Why was the target missed?	Point of Contact
		Goals			Review action	Target	Actual	Target	Actual	Target	Actual	Target	Actual	When will the target be completed?	
Fire Influence on Regional and Global Environments Experiment (FIREX-AQ) joint with NASA: use the NASA DC-8 aircraft to measure emissions and investigate chemical processing of emissions during downwind transport of plumes from wildfires in the U.S. (NOTE: this activity was combined with NASA due to NOAA WP-3D aircraft non-availability.)	Cumulative number of field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of chemical, physical, and dynamical processes that influence atmospheric composition.	Detect Changes in the Ocean and Atmosphere	FALSE	FALSE	FALSE	1	CANCELED							What is the risk of missing the target? This target was met on schedule. The last flights of the mission were scrubbed due to aircraft issues. However, all previous mission flights were completed and high quality observations collected. Data analyses and modeling are now underway.	Eric Williams
Evaluation of climate-related properties of one chemical compound proposed as a replacement for ozone-depleting substances	Cumulative number of controlled laboratory studies that evaluate industrial compounds (e.g., solvents; refrigerants) for adverse effects on stratospheric ozone and global warming prior to large-scale manufacture.	Drive Innovative Science	FALSE	FALSE	FALSE					1	1				Eric Williams
Portable Optical Particle Spectrometer Network (POPS-Net) is a long-term field study to provide detailed aerosol measurements at high spatial and time resolution.The data will be used in conjunction with DOE and Leeds University (UK) modelers to evaluate and improve model representation of atmospheric aerosols at sub-grid scales.	Cumulative number of field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of chemical, physical, and dynamical processes that influence atmospheric composition.	Make Forecasts Better	FALSE	FALSE	FALSE	1	1								Eric Williams
The Atlantic Tradewind Ocean-Atmosphere Mesoscale Interaction Campaign (ATOMIC) is a field study to investigate atmospheric shallow convection and air-sea interaction in the tropical North Atlantic east of Barbados.CSL scientists will focus on cloud microphysical measurements to improve parameterization of these critical cloud processes in models.	Cumulative number of field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of chemical, physical, and dynamical processes that influence atmospheric composition.	Explore the Marine Environment	FALSE	FALSE	FALSE					1	1				Eric Williams
As part of the UCAR CPAESS Visiting Scientist Program, CSL scientist (Dr. Amy Butler) will continue collaboration with NCEP CPC to create operational GFS and CFSv2 forecasts of the stratosphere.	Annual completion rate (percent) of stakeholder supported scientific research activities (i.e., MOAs, MOUs, etc.) that require laboratory studies, field studies, modeling and analyses to provide actionable scientific information needed by stakeholders.	Make Forecasts Better	FALSE	FALSE	FALSE							1	1	Target was met and research is ongoing. However, further research activities required a modified agreement due to change of Dr. Butler from CIRES to Federal employment.	Eric Williams
CSL is working with GSL, ARL, and NCEP/EMC to implement and evaluate aerosol chemistry in the FV3-based Global Forecasting System (GFS). CSL evaluates the FV3GFS-Aerosols model using aircraft observations collected during the Atmospheric Tomography Mission (ATom). FV3GFS-Aerosols, whose code was frozen in August 2019 and delivered to EMC for operational implementation, will become the newest member of NOAA's Global Ensemble Forecasting System in FY20.	R2A Index:Annual number of OAR R&D products transitioned to a new stage(s) (development, demonstration, or application).	Make Forecasts Better	FALSE	FALSE	FALSE							1	1		Eric Williams
CSL is working with GSL, NESDIS, and Science and Technology Corporation to improve retrievals from instruments onboard the NOAA/NASA Joint Polar Satellite System's spacecraft, including Suomi-NPP and NOAA-20. CSL uses observations from aircraft field missions, such as ATom and FIREX-AQ, to evaluate the vertical profiles and horizontal distributions of trace gases measured by the CrIS infrared sounder and aerosol optical depths measured by the VIIRS visible-infrared radiometer. CSL's evaluations are leading to improvements in the CrIS and VIIRS retrieval algorithms that will ultimately transition to the operational products from NESDIS/STAR.	R2A Index:Annual number of OAR R&D products transitioned to a new stage(s) (development, demonstration, or application).	Detect Changes in the Ocean and Atmosphere	FALSE	FALSE	FALSE							1	1		Eric Williams
CSL has recently initiated a comprehensive program at the DSRC in Boulder, CO, to examine changes in atmospheric composition related to decreased economic activity as a result of the COVID19 crisis. COVID-AQS is a research activity aimed at assessing changes in emissions and their effects on air quality and climate. This is an ongoing study taking advantage of significantly reduced emissions from vehicle traffic and other man-made sources to investigate changing chemical and physical processes in the atmosphere. CSL will continue these measurements to assess atmospheric changes as economic activity resumes and man-made emissions return to pre-COVID19 levels.	Cumulative number of field studies planned and executed that provide 1) high quality data sets with defined uncertainties and 2) interpretations and analyses used to advance scientific understanding of chemical, physical, and dynamical processes that influence atmospheric composition.	Detect Changes in the Ocean and Atmosphere	FALSE	FALSE	FALSE							1	1		Eric Williams

CSL FY20 R2X

					Lifecycl	e Phase	e		Lifecyc	le Phase	e					FY-19 Ta	argets & Ac	tuals				Euto	IN EV T	armote						Aclear	Tu	no of P	
					Movin	g from			Mov	ing to		FY-2	0 Q1	FY-2	0 Q2	FY-2	0 Q3		F	FY-20 Q4		Full	le FT la	argets				OAR		statement of what	iy	Je of K2	^
Identifier (Name of Parent Project)	Brief Description	OAR Strategic Goals	Weather Act	Research	Development	Demonstration	Operations or Applications	Research	Development	Demonstration	Operations or Applications	Target	Actual	Target	Actual	Target	Actual	Target	Actual	Why was the target missed? When will the target be completed? What is the risk of missing the target?	21	22	23	24	25	Date Complete	d OAR Point of Contact	Contributi ng Partners	Customer	condition must be met for the product advancement	Operations	Commercial	Other
Improved trace gas and aerosol satilite retrievals	CSL is working with GSL, NESDIS, and Sichen and Technology Corporation to improve retrievals from instruments onboard the NOAA/NASA Joint Polar Satellite System's spaceraft, including Suomi-NPP and NOAA-20. CSL uses observations from aircraft field missions, such as A from and FIRER AQ, to evaluate the vertical profiles and horizontal distributions of trace gases distributions of trace gases measured by the Cris Infrared Sounder and actioneter, CSV evaluations are leading to limprovements in the Cris and VIIIS retrieval algorithms that will ultimately transition to the NESDIS/STAR.	Detect Changes in the Ocean and Atmosphere	FAISE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE	FALSE	FALSE							x	x								Eric Williams	GSD	NESDIS	NESDIS uses improved retrieval algorithms for operational products from JPSS systems	TRUE	FALSE	FALSE
Improved representation of aerosols in operational forecast models	CSL Is working with GSL ARL, and NCEP/EMC to implement and evaluate aerosol demistry in the FV3-based Global Forecasting System (GFS). CSL evaluates the FV3GFS-Aerosols model using aircraft observations collected during the Atmospheric Tomography Mission (ATOm). FV3GFS-Aerosols, whose code was frozen in August 2019 and delivered to EMC for operational implementation, will become the newest member of NOAA's Global Ensemble Forecasting System in FY20.	Make Forecasts Better	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE							x	x								Eric Williams	ARL, GSD	NCEP/EMC	NCEP/EMC uses aerosol chemistry in GFS operational forecasts	TRUE	FALSE	FALSE