Climate Monitoring & Assessment and Climate Adaptation – 2021-2022

*[NOTE: make sure to edit **pre**- or **post**- in the text above, to tell the reader whether this logic and action plan is in preparation for your quarterly progress meeting or has been updated based on discussion at the quarterly progress meeting.]*

Long-term Target: (the metric for success of Outcome)
Two-year Target: (increment of metric for success)

Instructions: Before your quarterly progress meeting, provide the status of individual actions in the table below using this color key.
Action has been completed or is moving forward as planned.
Action has encountered minor obstacles.
Action has not been taken or has encountered a serious barrier.

Additional instructions for completing or updating your logic and action plan can be found on ChesapeakeDecisions.

Factor	Current Efforts	Gap	Actions	Metrics	Expected Response and Application	Learn/Adapt
What is impacting our ability to achieve our outcome?	*What current efforts are addressing this factor?*	*What further efforts or information are needed to fully address this factor?*	*What actions are essential (to help fill this gap) to achieve our outcome?*	*What will we measure or observe to determine progress in filling identified gap?*	*How and when do we expect these actions to address the identified gap? How might that affect our work going forward?*	*What did we learn from taking this action? How will this lesson impact our work?*
Outcome: Monitoring & Assessment						
Monitoring & Assessment: Scientific Capabilities. The scientific capabilities to estimate, project, model and monitor	Development of climate change indicators on Chesapeake Progress	Need scientific capability to monitor climate and other stressors simultaneously; need	1.3, 1.4, 1.6		Development of climate change indicators will depend on the quality of	

Commented [J1]: Merged non-climate related/multiple stressors factor with this factor. CRWG does not have the capacity to address the non-climate factors (other workgroups do). I recommend we collaborate with other workgroups to ensure that information is collected for both climate and non-climate stressors to be able to consider multiple stressors.

ecosystem changes and impacts as a result of climate change are complex ~~just emerging~~ and resource intensive. Additionally, impacts are exacerbated by non-climate stressors (e.g., land-subsidence, land use change, growth and development). Appropriate science and modeling of climate and non-climate related stressors are necessary for Chesapeake Bay Program partners to properly address climate impacts during policy planning and adaptation efforts.	Development of the climate change TMDL model	to ensure that long-term monitoring networks include key parameters to assess climate change impacts and multiple stressors; need to sustain and support long-term monitoring networks (e.g., CBP Monitoring Network, Sediment Elevation Table Marsh Studies); need adequate downscaled climate modeling data and data to develop and test models; need continued efforts to understand thresholds of climate stressors on water quality, fisheries, and habitats, interaction of multiple stressors, and quantification of co-benefits.			supporting data, the added value of the indicators for helping to understand and explain management successes, and the priorities and resources of the CBP Partnership. CRWG is planning to develop 1-2 new climate change indicators during 2021-2022.	
Monitoring & Assessment: Geographic Extent/Variability of the Watershed. The impacts of climate change will be varied across the Watershed. It is important to not limit the focus of the management strategy to coastal issues alone but to recognize the wide range of monitoring, assessment and adaptation needs throughout the region. However, the variability of the ecosystem within the Bay proper and the larger	Scientific data collection at DE, MD, VA NERRS sites to gain a better understanding of what is happening at the reserve level and how that can be applied to the Bay as a whole Healthy Watersheds is incorporating	Need methods aimed to improve data consistency and comparability among regions and sectors.	1.5, 1.7		Currently, the CRWG does not have adequate resources to tackle both Bay and watershed climate change assessment needs across workgroups simultaneously. Need partner support.	

watershed presents challenges in data consistency and comparability among regions and sectors.	climate metrics and vulnerability into their Healthy Watersheds Assessment					
Monitoring & Assessment: Complexity of the Monitoring Program. Developing a monitoring program to detect ecosystem change and inform program and project response is a complex undertaking. Developing an acceptable monitoring approach for the watershed will be complex, and there are clear budgetary challenges associated with such long-term monitoring.	Data collected by NOAA Chesapeake Bay Sentinel Site Cooperative (CBSSC) and satellite office, CBP Monitoring Network	Need institution capacity to develop and perform long-term monitoring to detect ecosystem change, and a steady funding source for such efforts; need to evaluate alternative monitoring strategies, such as use of satellite data.	1.1, 1.2		Outside CRWG capacity. Need to identify partners that can support monitoring needs; Monitoring Workgroup is looking into developing a STAC proposal to evaluate new technologies and new partners to enhance monitoring capacity—key climate parameters in connection with climate change indicators should be considered	
~~**Monitoring & Assessment: Non-Climate-Related and Multiple Stressors.** Overall, climate change impacts are particularly difficult to monitor and assess because they can be exacerbated by existing non-~~						

~~climate or human-induced stressors such as regional or localized land subsidence, land use change, growth and development. It is often difficult to differentiate climate impacts from the impacts of other stressors. An increased understanding of these interactions is necessary to successfully assess climate impacts, and the effectiveness of restoration and protection policies, programs and projects.~~						
Outcome: Adaptation						
Adaptation: Stakeholder Engagement. Although there is acknowledgement that climate change and adaptation need to be addressed, there is a lack of understanding or agreement from stakeholders on what it means to be resilient or what constitutes resiliency, including what kind of actions support an adaptive management approach. Lack of appropriate stakeholder engagement jeopardizes acceptance of choices made about action plans and implementation strategies, introducing additional levels of social discord in an already complex environmental-economic-social landscape. If social stability is reduced, then policy effectiveness would likely be reduced.	Worked with Local Government Advisory Committee on forum that developed recommendations for local governments on what they can do to act more deliberately in addressing flooding issues from changing climate conditions. Collaborating with CBP Local Engagement Team on identifying climate change-	Need collective agreement; need coordination and collaboration among stakeholders; need willingness to discuss managed retreat as an option; need support in following up on recommendations.	2.1, 2.4, 2.5			Outside current CRWG capacity

	related local engagement needs and resources.					
Adaptation: Capacity. Institutions and the private sector have a general lack of capacity to understand the science and incorporate meaningful change into plans, programs, processes or projects. Although building that capacity is paramount, it can be time consuming and costly, considering the resource constraints faced by governments and organizations and the variability in adaption approaches.	Development of a Chesapeake Bay climate resilience implementation progress tracker for tidal and non-tidal areas.	Knowledge of types of technical assistance/expertise needed by jurisdictions.	2.2, 2.3, 2.6			
Adaptation: Authority. Governments' and institutions' ability to respond to climate change is also limited by legislative, policy, regulatory and other authorities.	Individual jurisdictional incorporation of climate narrative (or voluntary numerical target) into WIPs III. States and communities around the Chesapeake Bay are taking steps to prepare or maintain their climate change adaptation or sustainability plans.	Need knowledge of institutional/regulatory barriers; need incorporation of climate change considerations across programs.	1.5, 2.9			Outside current CRWG staff capacity
Adaptation: Guidance. There is currently a lack of clear science (models, tools	Ongoing research and models, tools and metric	Need development of clear tools and guidance to develop	2.2, 1.5			

Commented [J2]: Build into logic item – new workgroup focus – synthesis work to support targeting of adaptation projects, provide technical assistance/expertise to develop

and metrics) and guidance for the Chesapeake Bay Program, as well as stakeholders, to use to develop plans or to measure efficacy of response. The nature of on-the-ground implementation often requires certainties (e.g., hydrology, water quality, temperature, precipitation, sea level rise, coastal erosion rates) that are not yet available for a changing climate. Additionally, there is variability in institutional responses.	development by CBP partners	plans and efficacy of response; lack of extensive information (or information dissemination) on the costs of climate change impacts in specific areas, or the cost savings and ecosystem benefits represented by specific mitigation or adaptation measures.				
Adaptation: Collaboration. The many and diverse stakeholders and organizations that make up the Bay Program are a strength, but it also causes collaboration challenges that must be addressed in order to maximize limited~~leverage~~ resources and provide strategic ~~consistent~~ adaptation approaches across the watershed.	The Climate Resiliency Workgroup meets monthly to discuss a variety of climate topics and provide a forum for information-sharing to encourage collaboration	Need to achieve strategic collaboration that maximizes limited resources; need consensus on strategic adaptation approaches that fit the impact and area of concern. ~~consensus and provide consistent approaches.~~	2.7, 2.8, 2.9			
~~**Outcome Adaptation: Variable adaptation approaches.** There is variability in institutional responses and the capacity to respond.~~						

Commented [J3]: I recommend that we incorporate variability in approaches under this factor.

Commented [J4]: Is "consistent" the right word? Approaches will vary across the watershed? I feel this should focus on best approaches for impacts that need to be addressed for that area.

Key: Rows shaded in blue have been identified as primary actions for the Climate Resiliency Workgroup (CRWG) for the next 2 years and includes a mix of Chesapeake Bay Program and CRWG member priorities. Actions with bolded text indicate activities that the core CRWG members identified that they are most interested in making progress on. Rows shaded in white are secondary actions capturing climate-related activities across the Chesapeake Bay Program. Support from CRWG for secondary actions will be considered on a case-by-case basis and dependent on the availability of staff and workgroup members.

Monitoring & Assessment Actions – 2021 - 2022					
Action #	Description	Performance Target(s)	Responsible Party (or Parties)	Geographic Location	Expected Timeline
Management Approach 1: Assess past and future trends of climate change in the Bay and watershed					
1.1	Assess utility of climate change indicators in tracking climate resilience for water quality, living resources, habitats, and public infrastructure and determine strategy for updating prioritized indicators	a. Evaluate the usefulness of existing (on Chesapeake Progress) and proposed climate change indicators with corresponding workgroups, STAR, and the Management Board to prioritize development and updates. Archive indicators that are not included in prioritization decisions. b. Develop a climate change indicator framework document that outlines implementation strategies for the prioritized indicators. Identify prospective cross-workgroup pathways connecting physical change (e.g., sea level rise, increased precipitation, warming temperatures) with ecological and community impacts to inform adaptation/resilience strategies related to the Chesapeake Bay Watershed Agreement outcomes. Include considerations for DEIJ application. Determine time periods for updating.	a. Julie Reichert-Nguyen (NOAA/CRWG), Breck Sullivan (CRC/STAR), Kathryn Barnhart (U.S. EPA/Status and Trends Workgroup), and relevant workgroups b. Climate Change Indicator Framework: Julie Reichert-Nguyen (NOAA/CRWG), Breck Sullivan (CRC/STAR), and summer intern (NOAA)	Bay/ watershed-wide or place-based	CRWG does not have the capacity to maintain all existing and proposed climate change indicators. Updating indicators will rely on available data and assistance from other workgroups/ agencies.
1.2	Coordinate the development of climate change indicators in connection with clear management objectives with corresponding	a. Coordinate the development of a Bay Water Temperature Change Indicator (previously identified as a cross-workgroup priority) in connection with fisheries management. b. Continue exploring collaboration with USGS to connect their stream temperature compilation project with updating the stream temperature	a. Bay Water Temperature Change Indicator: Julie Reichert-Nguyen (NOAA/CRWG) and Bruce Vogt (NOAA/Fisheries GIT), Peter Tango (USGS/STAR), Rebecca	Bay/ watershed-wide or place-based	CRWG plans to assist with the development 1-2 new climate change

	workgroups to inform climate resilience activities related to ecological and community impacts	indicator for use in the Healthy Watersheds Assessment involving brook trout habitat and the identification of potential resilience factors. c. Support the proposed 2021 STAC Workshop, "Rising Watershed and Bay Water Temperatures—Ecological Implications for Ecosystem Processes Influencing Stream, River, and Estuarine Health." Compile water temperature data sources and host cross-workgroup discussion on the utility of water temperature change indicators in connection to fisheries and habitats. d. Explore data needs for developing a wetland loss and/or marsh migration indicator(s) related to sea level rise (see action 1.4).	Murphy (UMCES/ITAT), Jeni Keisman (USGS/ITAT) b. Stream Temperature Change Indicator: Renee Thompson (USGS/Healthy Watersheds), John Klune (USGS), and Julie Reichert-Nguyen (NOAA/CRWG) c. Lead: Rebecca Hanmer (Forestry WG) and Rich Batiuk (CoastWise Partners) CRWG Support: Julie Reichert-Nguyen (NOAA), Breck Sullivan (CRC/STAR), Katie Brownson (USFS/CRWG) Other Workgroups: Bill Dennison (UMCES/STAR), Scott Phillips (USGS/STAR), Bruce Vogt (NOAA/Fisheries GIT), Renee Thompson (USGS/Healthy Watersheds) d. See action 1.4		indicators (2021-2022). Development of new indicators will depend on the quality of supporting data, cross-workgroup involvement, and the priorities and resources of the CBP Partnership.

Management Approach 2: Work with CBP Goal teams to fill critical data and research gaps and improve understanding of climate change impacts and implications for selected outcomes in the Chesapeake Bay Watershed Agreement					
1.3	**Increase capacity to better understand sea level rise impacts to habitats and their ecosystem services**	**a. Partnered on GIT-funding project synthesizing shoreline, sea level rise, and marsh migration data to inform wetland restoration targeting. Explore use of methodology to support development of possible wetland loss/marsh migration indicators related to sea level rise.** **b. Identify and invite subject matter experts to present information on sea level rise impacts to habitats and relevant ecosystem services research.**	**a. Technical Lead: Kevin DuBois (DOD/Wetland WG/CRWG)** **Co-lead: Julie Reichert-Nguyen (NOAA/CRWG)** **Support: Breck Sullivan (CRC/STAR), Taryn Sudol (MD Sea Grant/CRWG), Jackie Specht (TNC/CRWG), Nicole Carlozo (MDNR/CRWG), Peter Claggett (USGS/ LUWG), Labeeb Ahmed (GIS Team), Megan Ossmann (CRC/Wetland WG)** **Contractor: In process of being selected** **b. Julie Reichert-Nguyen (NOAA/CRWG), Breck Sullivan and Tom Butler (CRC/STAR)**	**Placed-based (target area – Middle Peninsula, VA)**	**2021-2022**
1.4	Coordinate with the Modeling Workgroup and the Water Quality Goal Implementation	a. Review climate model narrative language and provide suggestions on the language for easier interpretation.	CRWG: Mark Bennett (USGS), Tom Butler (CRC/STAR), Julie	Bay/ watershed-wide	a. Needed before September 2021

	Team (WQGIT) to support the application of TMDL climate change projections	b. Meet with Modeling Workgroup and WQGIT to identify where assistance from CRWG will be needed to prepare the application of the TMDL climate change model projections for 2025.	Reichert-Nguyen (NOAA) Modeling Workgroup: Dave Montali (TetraTech), Lew Linker (U.S. EPA) WQGIT: Lucinda Power (U.S. EPA), Ed Dunne (DOEE)		b. 2021-2022
1.5	Support the WQGIT on BMP climate resilience assessments needed to update Watershed Implementation Plans	a. Coordinate with WQGIT in identifying BMPs where climate change research is most needed. b. Review Virginia Tech BMP Climate Resilience Assessment Report (STAC and NOAA-funded; focuses on urban, ag, and natural BMPs) and Chesapeake Stormwater Network/Urban Stormwater Workgroup's urban stormwater BMP climate resilience assessments. c. Host cross-workgroup meeting to present and discuss findings from above assessments (b) and identify next steps related to developing a research agenda for climate change BMPs where there are information gaps and adaptation strategies for Watershed Implementation Plans where information exists. d. Work with the Management Board to identify alternative options (e.g., jurisdictional help) in supporting a BMP climate change research agenda.	CRWG: Julie Reichert-Nguyen (NOAA), Tom Butler (CRC/STAR) STAC: Kurt Stephenson (Virginia Tech) WQGIT: Ed Dunne (DOEE), Lucinda Power (U.S. EPA), David Wood (CSN/Urban Stormwater Workgroup) Modeling Workgroup: Lew Linker (U.S. EPA), Dave Montali (TetraTech) Contractor: Zach Easton and Jeremy Hanson (Virginia Tech)	All jurisdictions	2021-2022
1.6	Increase capacity to better understand increased precipitation and warming temperature	a. Support climate SAV model synthesis GIT-funding project to better understand climate change impacts on SAV populations by advising on project when needed.	Technical Lead: Becky Golden (MDNR/SAV Workgroup) Support: Brooke Landry (MDNR/SAV Workgroup), CRWG		2021-2022

	on submerged aquatic vegetation (SAV)		Contractor: In process of being selected		
1.7	Support efforts of STAR to promote use of climate science data and collaborative data partnerships (EnviroAtlas/ Ecosystem Services)	a. Explore collaborative opportunities with existing tools, such as EnviroAtlas and EJ screening, to use data from the Chesapeake Bay Data and Mapping Portal in support of Chesapeake Bay Program needs related to ecosystem services and diversity, equity, inclusion, and justice (DEIJ). Data available at: at https://data-chesbay.opendata.arcgis.com/search?tags=Climate% 20Resiliency	Bill Jenkins and Bo Williams (U.S. EPA/Ecosystem Services Team), Tom Butler (CRC/STAR)		Limited CRWG staff resources to support this action in 2-year timeframe

Adaptation Actions – 2021 - 2022					
Action #	Description	Performance Target(s)	Responsible Party (or Parties)	Geographic Location	Expected Timeline
Management Approach 1: Improve knowledge and capacity to implement and track priority adaptation actions					
2.1	**Develop a methodology to track climate resilience implementation progress**	**a. Support FY19 GIT-Funded project, "Bay-wide Climate Resilience Scorecard for Watershed Communities." Purpose of project is to identify climate resilience implementation and methodology to track progress in restoration and protection policies, programs, and projects for inland and coastal areas. Include the consideration of social equitable planning.**	**GIT-Funded Technical Lead: Julie Reichert-Nguyen (NOAA/CRWG)** **Support: Breck Sullivan (CRC/STAR) Elizabeth Andrews (William and Mary/CRWG), Jim George (MDE/CRWG), Melissa Deas (DOEE), Tuana Phillips (DEIJ Workgroup)**	**Coastal and Inland locations in Bay/ watershed**	**2021**

			Contractor: RAND Corp./MARISA		
2.2	**Assist with capacity-building activities that support the implementation of priority climate adaptation projects**	**a. Identify federal, state and nongovernmental partners who are providing technical and financial assistance for adaptation projects and connect these groups to local governments and communities pursuing climate adaptation planning and implementation.** **b. Identify and convene discussions on successful resilient designs, obstacles, gaps in information, lessons learned, and innovative solutions related to priority adaptation actions (e.g., natural infrastructure that contributes to flood mitigation).** **c. Explore funding avenue to create a citable document/decision matrix that consolidates guidance on best practices for siting, selecting, and/or constructing nature-based adaptation projects.** **d. Define goals of potential adaptation workshops/trainings and explore potential funding avenues, partner sponsorship, or leveraging existing regional/local conferences, forums, or workshops.**	**CRWG: Nicole Carlozo (MDNR), Jason Dubow (MDP), Jim George (MDE), Kevin DuBois (DOD), Jackie Specht (TNC), Katie Brownson (USFS/CRWG), Julie Reichert-Nguyen (NOAA)**	**TBD**	**2021-2022**
2.3	Identify blue carbon science needs to apply existing blue carbon crediting protocols	a. Explore opportunities (e.g., internships, STAC workshop, GIT-funding, etc.) to assess available blue carbon information and identify science gaps in applying existing blue carbon crediting protocols for wetland and SAV restoration projects in Chesapeake Bay. b. Connect blue carbon science review with groups engaging in implementing finance approaches.	a. Mentor: Molly Mitchell (VIMS/CRWG) Co-Mentor: Julie Reichert-Nguyen (NOAA/CRWG) Support: CRC C-stREAM Summer Intern		2021

			b. Kristin Saunders (Budget and Finance Workgroup)		
Management Approach 2: Undertake public and stakeholder engagement to increase understanding of climate change impacts to inform and support adaptation					
2.4	Provide climate resilience content for educational modules and local government workshops	a. Work with existing Chesapeake Bay educational network to provide data, information, and topical experts in support of targeted engagement related to climate change impacts. b. Provide information for the educational modules being developed by the Local Leadership Workgroup. c. Provide support to the GIT Funded Project "Planning for Clean Water: Local Government Workshops." Incorporate climate resilience considerations.	Local Leadership Workgroup (Lead): Laura Cattell Noll (Alliance for the Chesapeake Bay) CRWG (Review Support): Katie Matta (EPA Region 3), Julie Reichert-Nguyen (NOAA), Breck Sullivan (CRC/STAR)		2021-2022
2.5	**Coordinate with the CBP Communications and Local Engagement Team to help with the climate resiliency outcome actions related to communications/ outreach and/or local engagement**	**a. Identify CRWG communication and local engagement needs and incorporate them into the Local Engagement Needs and Resources spreadsheet.** **b. Work with Communications and Local Engagement Team on messaging needs regarding priority adaptation actions from Action 2.2 and past forums (e.g., LGAC Workforce Development and Flood forums).**	**CBP Communications: Rachel Felver (Alliance for the Chesapeake Bay) and Marisa Baldine (CRC)** **Local Engagement Team: Laura Cattell Noll (Alliance for the Chesapeake Bay)** **LGAC: Jennifer Starr (Alliance for the Chesapeake Bay)** **CRWG: Katie Matta (U.S. EPA Region 3), Breck Sullivan and**		**Limited CRWG staff resources to support local engagement needs**

			Tom Butler (CRC/STAR)		
Management Approach 3: Address the institutional capacity of the Chesapeake Bay Program to prepare for and respond to climate change					
2.6	Consult on cross-GIT climate change projects	a. Provide advisory support for the Habitat GIT's FY19 GIT-Funded project, "Targeted Local Outreach for Green Infrastructure in Vulnerable Areas." b. Fish GIT – forage fish indicator related to warming temperatures on abundance. c. Social science outcome review (GIT-funded project). d. Provide support to the Urban Stormwater Workgroup where needed from an advisory capacity involving the application of information from the Intensity, Duration, Frequency (IDF) curve GIT-funded project to address climate impacts due to precipitation changes. e. Explore opportunities to connect the change in high temperature extremes and tree canopy indicator efforts related to building resilience for underserved communities.	a. GIT-funded Lead (Habitat GIT): Chris Guy (FWS) and Julianna Greenburg Support: Julie Reichert-Nguyen (NOAA/CRWG) and Breck Sullivan (CRC/STAR) b. Mandy Bromilow (NOAA/Fisheries GIT) c. Amy Hayden (UMCES) d. Norm Goulet (VA Northern Regional Commission/USWG) Lew Linker (EPA, Modeling Workgroup) e. Sally Claggett (USFS) and Julie Mawhorter (USFS) and Katie Brownson (USFS/CRWG) a-d. CRWG subject matter experts when available	a. Cambridge, MD, West Point, VA, and Williamsport, PA b. Bay-wide c. NA d. Watershed-wide	a. 2021 b-d. 2022
2.7	Utilize the Chesapeake Bay Program's SRS process to conduct a	a. Develop a workgroup charter that describes workgroup's role, membership contributions, participation benefits, and operating principles – how best the workgroup can support climate resilience outcomes and other workgroup	Julie Reichert-Nguyen (NOAA/CRWG), Mark Bennett (USGS/CRWG), and		2021-2022

	biennial review of the Climate Resiliency Workgroup and assess priorities	outcomes and within the watershed and member organizations. b. SRS Support – Develop Climate Resiliency Workgroup work plan, logic table and update management strategies to determine the workgroup approach and actions for the next two years. c. Prepare document of high priority science needs to disseminate among groups. d. Work with the Management Board to identify opportunities with their organizations and other government agencies to support CBP climate-related activities outside the current CRWG capacity.	Breck Sullivan and Tom Butler (CRC/STAR)		
2.8	CRWG membership and meetings	a. Distribute survey to workgroup members to understand their climate related interests and expertise to identify opportunities and gaps in membership to support Monitoring and Assessment and Adaptation Outcomes and cross-workgroup climate-related projects. b. Seek to expand workgroup membership to include more federal partners where there are likely to be more funding opportunities. c. Organize and facilitate CRWG meetings. Work with members to identify the best structure for meetings to effectively make progress on CRWG actions.	Julie Reichert-Nguyen (NOAA/CRWG), Mark Bennett (USGS/CRWG), and Breck Sullivan and Tom Butler (CRC/STAR)		2021
2.9	Prepare for new federal and state climate initiatives and emerging issues related to the Chesapeake Bay	a. Support PSC Climate Action Team to draft climate activities for EC Directive. b. Federal Office Directors (FOD) communicate with CRWG on new administration climate policy and direction.	a. Mark Bennett (USGS/CRWG) and subject matter experts b. Lee McDonnell and Emily Trentacoste (U.S. EPA/CBP Office Science		2021-2022

	climate resilience needs	c. Develop process to document emerging issues provided by workgroup members.	Branch), FOD: Scott Phillips (USGS), Sean Corson (NOAA) c. Julie Reichert-Nguyen (NOAA/CRWG), Tom Butler (CRC/STAR)		