

Ocean networks Canada

Some New Ocean Observing Initiatives

Richard Dewey (ONC & DSC) | OOIFB Oct 2022

A UNIVERSITY OF VICTORIA INITIATIVE

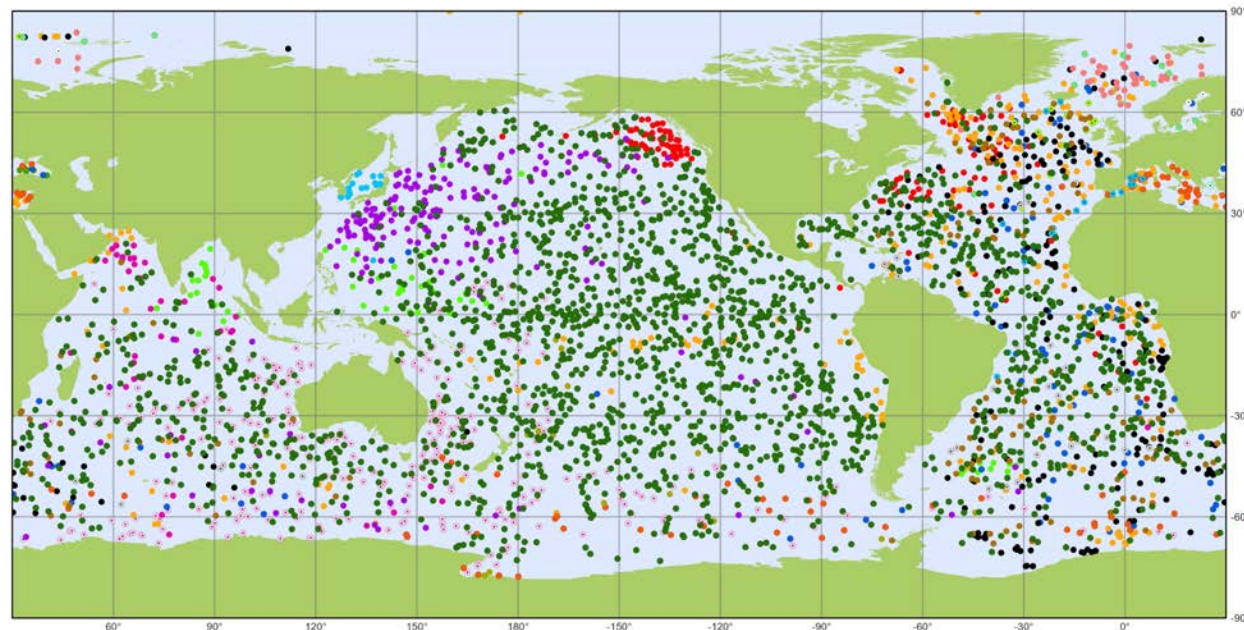
Some New ONC Ocean Observing Initiatives

- **BGC Argo Floats (on order, deployments in 2023)**
 - Microstructure BGC Argo Floats
 - Deep BGC Argo Floats
- **Geodesy/Deformation and Wave Glider Surveys (completed install)**
 - North Cascadian Subduction Zone Observatory
 - Underwater GPS
- **Ocean-Based Climate Solutions (active and planning)**
 - Marine Carbon Dioxide Removal (mCDR) and Monitoring, Reporting, and Verification (MRV)

New ONC Programs – BGC Argo Floats

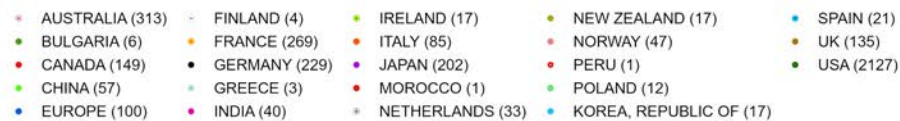
ONC has ordered a starting fleet of 20 BGC Argo floats

- DFO is the official Canadian Argo Program Operator, and has the authorization to maintain a fleet of standard Argo and BGC Argo floats.
- After consulting with DFO (Blair Greenan and Tetjana Ross), ONC decided to focus on non-standard (DFO approved) BGC Argo floats.

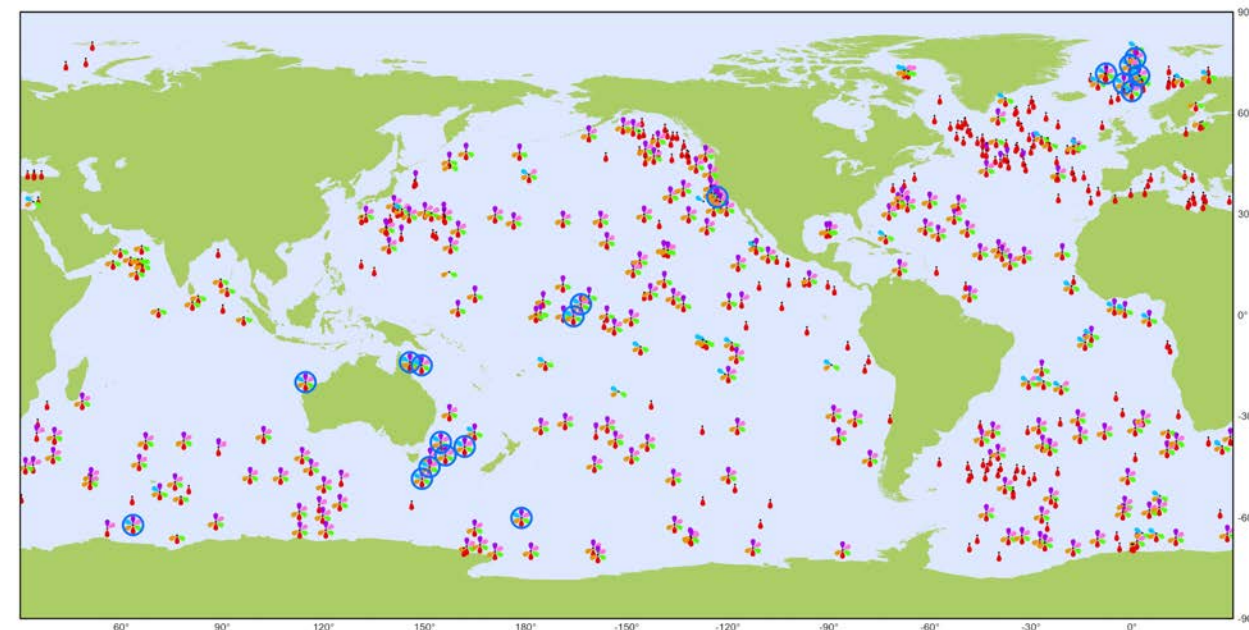


Argo National contributions - 3885 operational floats
Latest location of operational floats (data distributed within the last 30 days)

September 2022



Generated by ocean-ops.org, 2022-10-01
Projection: Plate Carree (-150,0000)

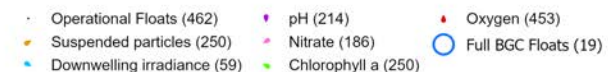


Biogeochemical Argo

Sensor Types

Latest location of operational floats (data distributed within the last 30 days)

September 2022



Generated by ocean-ops.org, 2022-10-01
Projection: Plate Carree (-150,0000)



New ONC Programs – BGC Argo Floats

MRV Microstructure BGC Argo Floats (2, plus Rockland DataHub)

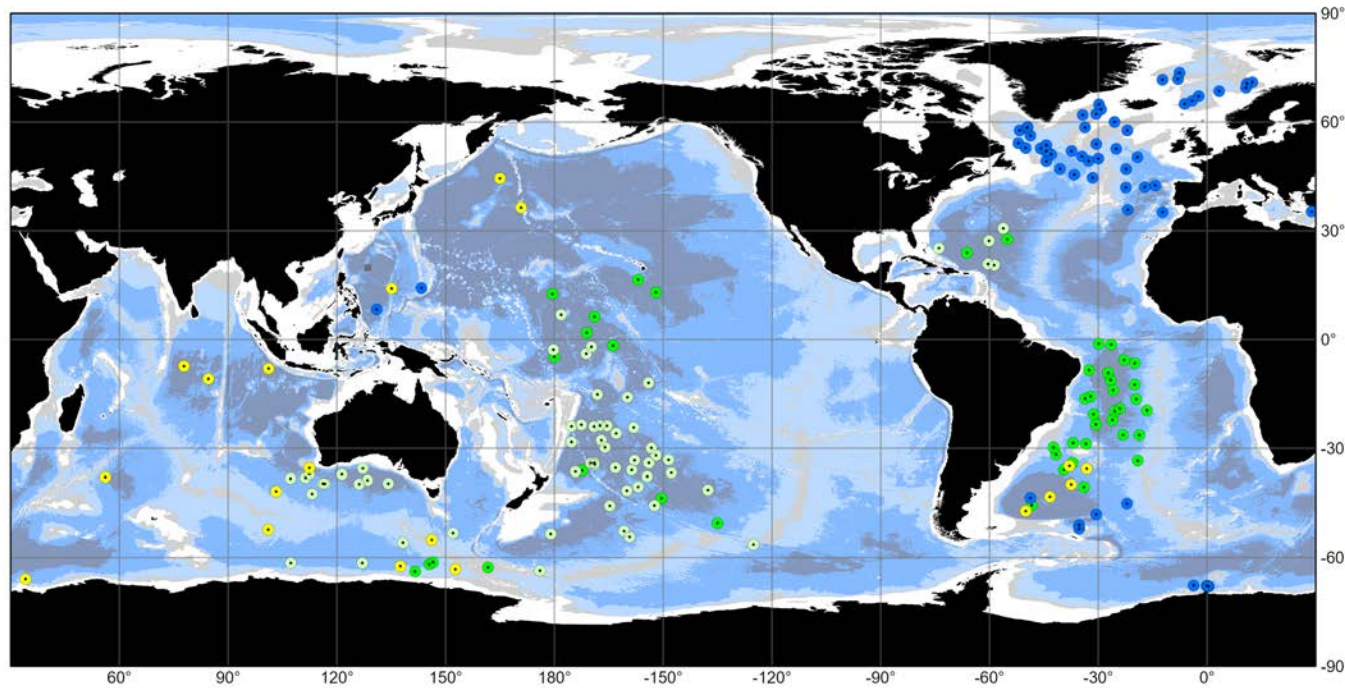
- With O₂ and Rockland Scientific Microstructure (μ T and μ Shear) sensors
- Two ordered for delivery in FY22/23 (before April 1, 2023)
- Process studies & sub-thermocline mixing assessment in NEP



New ONC Programs – BGC Argo Floats

NKE Arvor Deep BGC Argo Floats (up to 18)

- 0 - 4000m operating range (top-to-bottom in NEP)
- O₂ sensor, with surface (atmosphere) calibration check
- Up to 6 ordered for delivery in FY22/23
- Primary NEP deployment over next few years

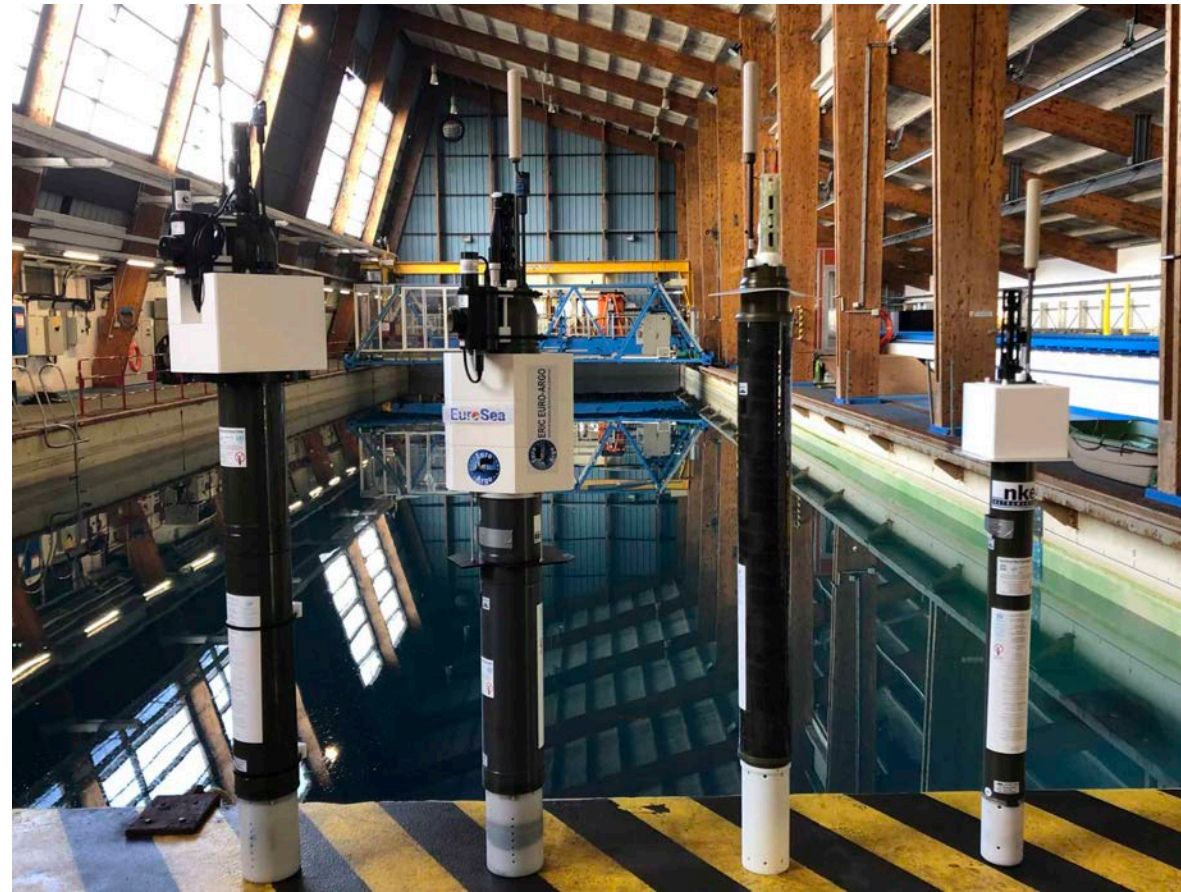


Deep Argo

Deep Float Models

September 2022

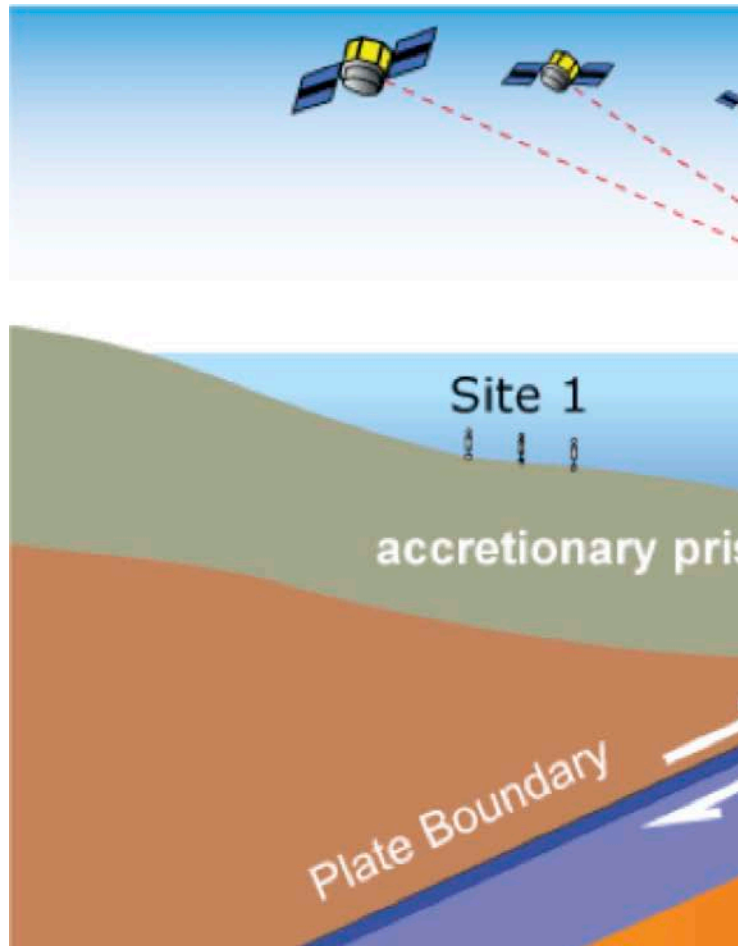
Latest location of operational floats (data distributed within the last 30 days),



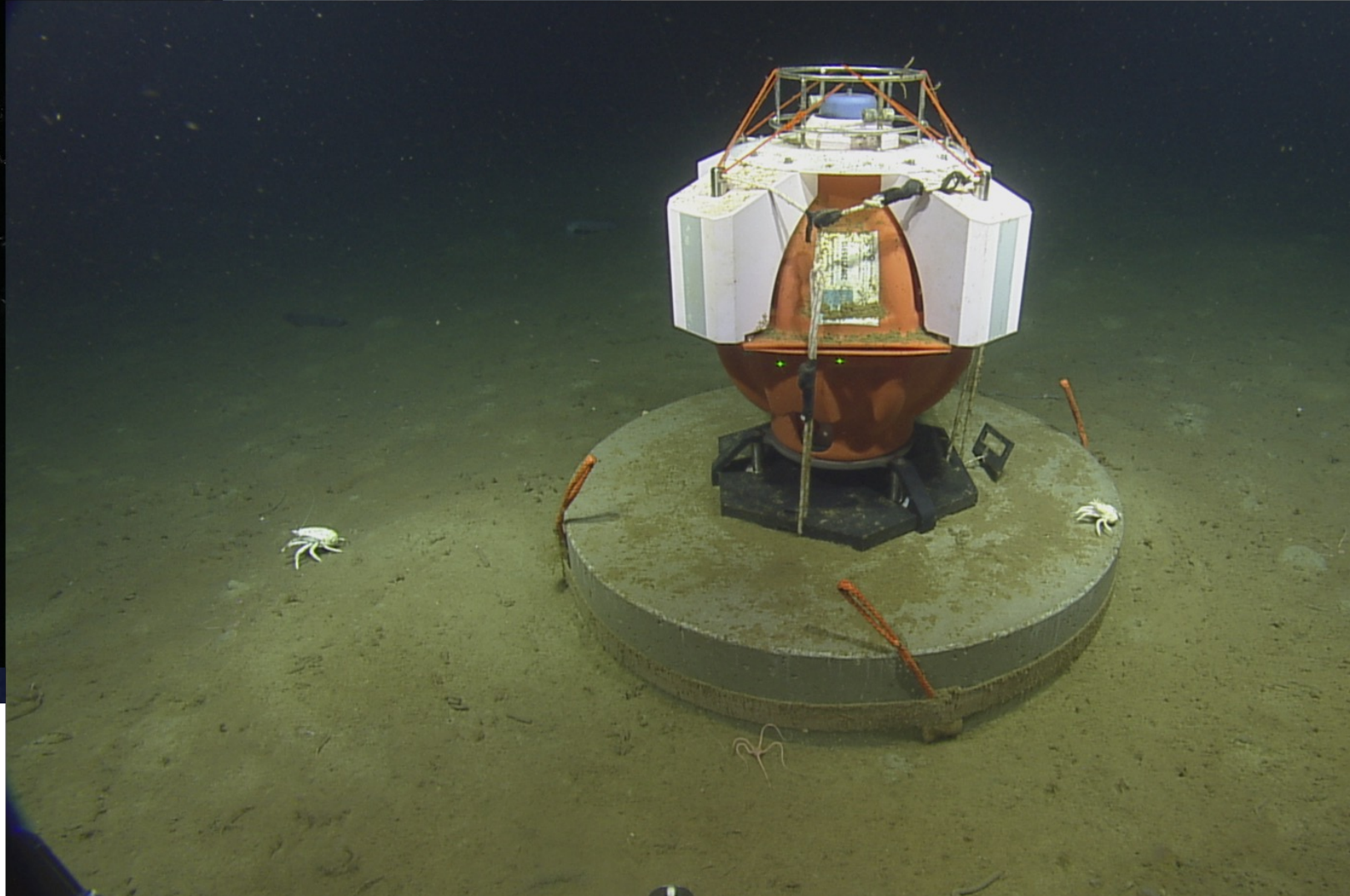
New ONC Programs – Geodesy (NCSZO)

The North Cascadia Subduction Zone Observatory (CFI)

- Establish a network of fixed transponders, and using under-water GPS, measure deformation across the NCZS, coordinate with Axial system



New ONC Programs - NCSZO



New ONC Programs - NCSZO



Mode: Follow Sequential Course
 Ave Speed(kts): 1.38
 Last Speed(kts): 1.06
 Target Waypoint: 14
 Meters to Target: 36.8
 Ave Water Speed(kts): 0

Light:

PIL1:

PIL2:

PIL3:

SV3 Commands

Follow Sequential Course

Hold Station At Waypoint

Follow Custom Course

Follow Fixed Heading

Set Parameter

Comment

More Commands...

End Mission

ONC/UMC GPS

Hide System Menus

ONC:

Martin Heesemann (Sign Out)

Health: Last refresh: Tue-Sep-14-2021 23:36:11 (UTC) Universal Time Coordinated, Casablanca, Monrovia

Now

Duration

3

day(s)

4m 16s

+ Map

Satellite

-

Google

Keyboard shortcuts

Map data ©2021

500 m

Terms of Use

SV3-271 - RO Communications

TimeStamp	Structure ID	Target	SOG (kt)	POG (deg)	Desired H...	Sub Head...	Water Sp...	Current Speed (kt)	Current Heading (...)	Lat (deg)	Lon (deg)	Command	Reason	Error Type
14/09/2021 23:35:34	Telemetry6	14	1.063	334	315	333	0.0000			48.42766	-126.17490			
14/09/2021 23:30:34	Telemetry6	14	1.484	178	314	324	0.0000			48.42712	-126.17450			
14/09/2021 23:25:34	Telemetry6	14	1.082	22	27	22	0.0000			48.42801	-126.17455			
14/09/2021 23:20:34	Telemetry6	14	1.011	278	325	342	0.0000			48.42734	-126.17496			
14/09/2021 23:15:34	Telemetry6	14	1.49	125	309	294	0.0000			48.42725	-126.17392			
14/09/2021 23:11:44	0	0	0	0						0.00000	0.00000	Comment	RUDICS call rec...	
14/09/2021 23:10:34	Telemetry6	14	0.946	347	348	5	0.0000			48.42774	-126.17495			
14/09/2021 23:05:34	Telemetry6	14	0.94	289	319	321	0.0000			48.42717	-126.17476			

SV3-271 - RO Commands

TimeStamp	Command Reason	Command	Command...	Combined Acks	Created By
14/09/2021 23:11:44	RUDICS call received from PSN008498	Comment	Created		RUDICS User
14/09/2021 23:02:57	RUDICS initiated 23:02:26 PSN008498	Comment	Created		RUDICS User
14/09/2021 22:00:45	RUDICS call received from PSN008498	Comment	Created		RUDICS User
14/09/2021 21:51:25	RUDICS initiated 21:50:54 PSN008498	Comment	Created		RUDICS User
14/09/2021 20:56:03	%G1_LuaWrapper.SendGPSACCommand(TG...	Write Console Script	Acked	>TGT:U8067EA...	Martin Heese...
14/09/2021 20:49:31	RUDICS call received from PSN008498	Comment	Created		RUDICS User
14/09/2021 20:40:56	RUDICS initiated 20:40:21 PSN008498	Comment	Created		RUDICS User
14/09/2021 19:38:25	RUDICS call received from PSN008498	Comment	Created		RUDICS User

A 2030 ONC Strategic Goal: Ocean-Based Climate Solutions

- **Solid Carbon:** Assessment and feasibility of sequestering carbon deep into ocean basalt (geological storage)
- **BC Ocean Acidification and Hypoxia Action Plan** (in press)
- Marine Carbon Dioxide Removal (**mCDR**) and the associate Measureing, Monitoring, Reporting, and Verification (**M²RV**)
 - Various technologies, from MacroAlgae to Alkaliniy Enhancement, lots of issues to sort out, field trials, and assessing impacts and efficiency will be key
 - MMRVV (Measurement, Monitoring, Reporting, Validate, and Verify)
 - Need to assess baselines and natural conditions/variations/ecosystem function
 - Need to assess impacts associated with mCDR field trial/activities
 - Need to assess “additive” contribution to long-term carbon sinks (small signal amongst large noise/natural variability)
 - M²RV Workshop (in 2023?)