



Diversity of institutions







Plateau Rosa

3480 m

45.9°N 7.7°E





NOAA standards for CO₂ and CH₄

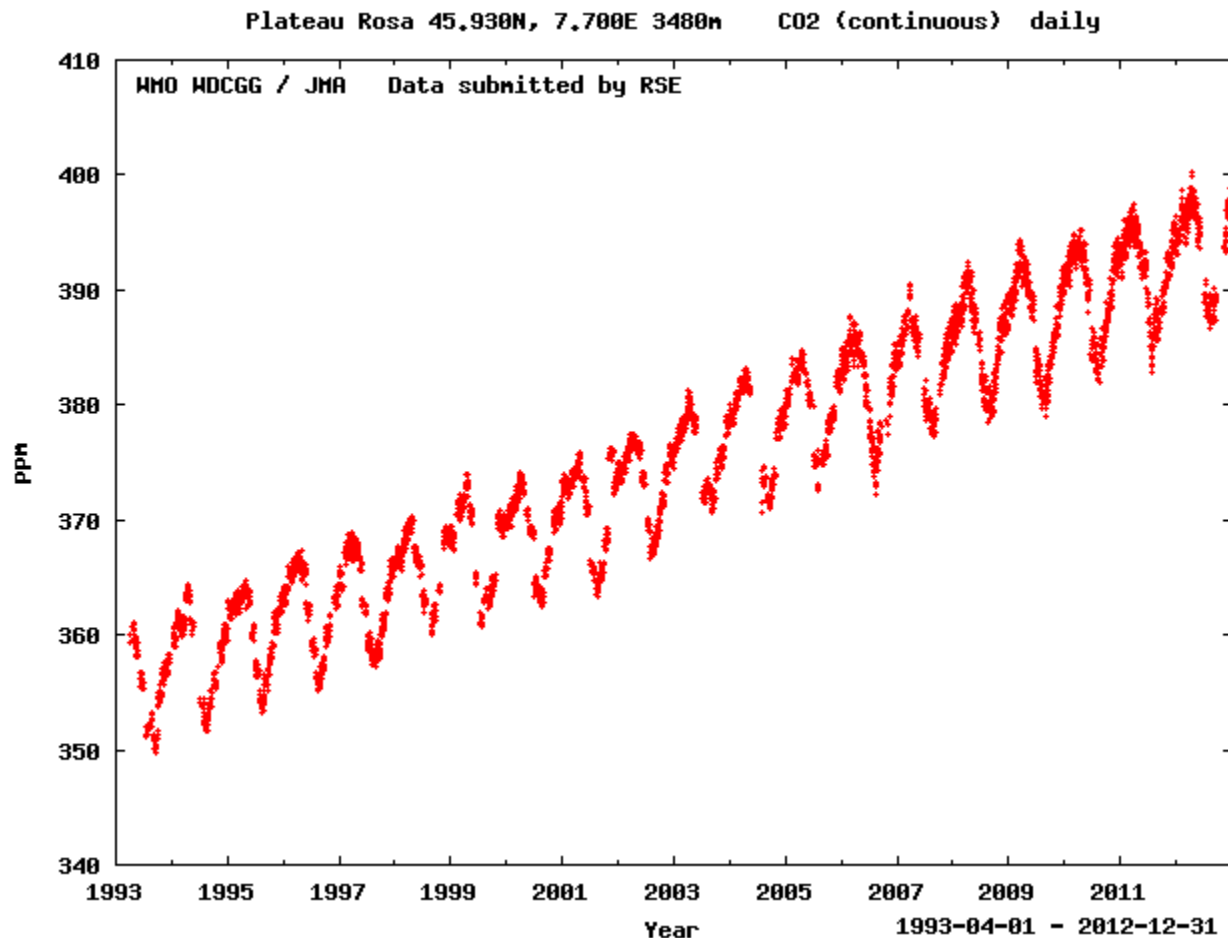


CO₂
 Ultramat 5E
 Ultramat 6E

CH₄
 NIRA

O₃
 Thermo Electron

Meteorological
 parameters





Mt. Cimone
2165 m
44.2°N 10.7°E



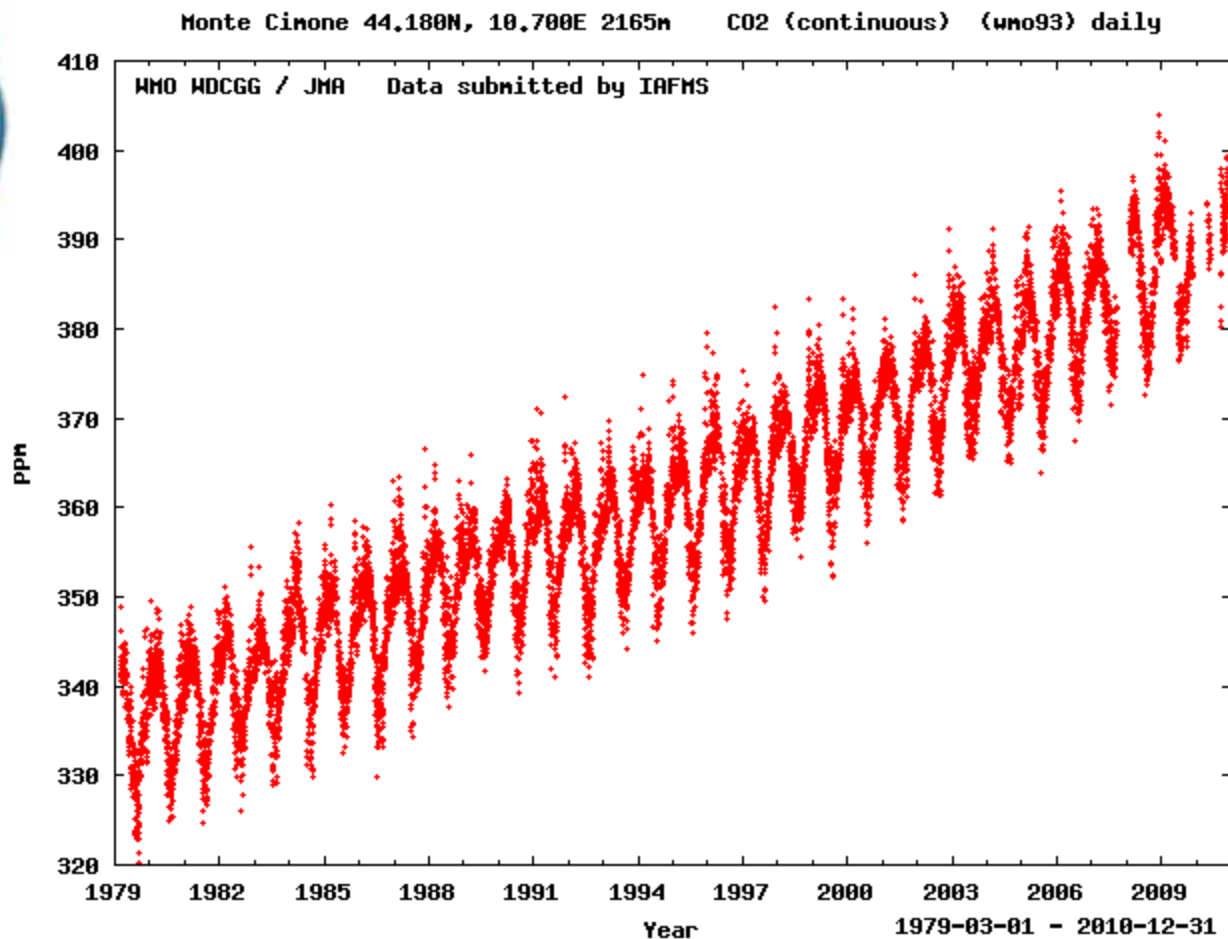
CO₂
Ultramat 5E

Tests for CH₄
FID-GC PCF 529

Meteorological
parameters

Picarro G2301
for CO₂ and CH₄

NOAA standards for CO₂



Kyoto and Montreal Gases

Methane

(GC-FID) 2008-

Sulphur hexafluoride

(GC-ECD) 2008-

Nitrous oxide

(GC-ECD) 2008-

CFCs (11, 12, 113, 114, 115)

(GC-MS) 2001-

HCFCs (22, 141b, 142b, 124)

(GC-MS) 2001-

HFCs (23, 32, 134a, 152a, 125, 143a, 365mfc)

(GC-MS) 2001-

Methyl halides (CH_3Cl , CH_3Br , CH_3I)

(GC-MS) 2001-

Reactive halogenated gases (CH_2Cl_2 , CH_2Br_2 , CHCl_3 , CHBr_3)

(GC-MS) 2001-

Chlorinated solvents (CH_3CCl_3 , CCl_4 , TCE, PCE)

(GC-MS) 2001-

PFCs (116, 218)

(GC-MS) 2008-

Other climate altering species

Surface ozone

(UV) 1996-

Carbon monoxide

(GC-FID) 2008-

Carbon monoxide

(NDIR) 2012-

Black carbon

(MAAP) 2005-

COS

(GC-MS) 2008-

Hydrocarbons (C3-C6)

(GC-MS) 2010-

Column NO_2

(GASCOD) 1993-



Aerosol

size distribution	10 nm – 500 nm	(DMPS)	2005-
size distribution	300 nm – 20 μ m	(OPC)	2002-
scattering coefficient		(nephelometer)	2007-
number concentration		(CPC)	2008-
chemistry (not continuous)			

Other parameters

Solar Radiation	2004-
Meteorological parameters (T, RH, P)	1996-

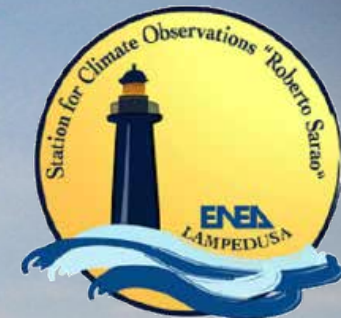


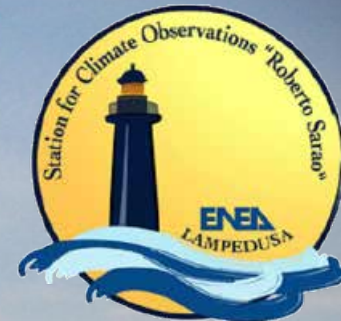


Lampedusa

45 m

35.5°N 12.6°E







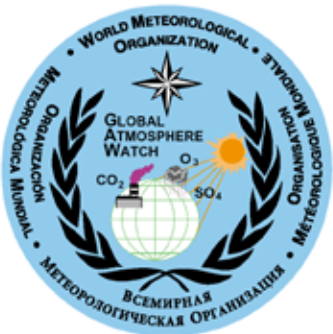






- Meteorological station [air pressure, temperature, humidity, wind direction and velocity, precipitation].
- Vaisala radiosounding [temperature, pressure, humidity, wind, ozone vertical profiles].
- Hat-Pro Microwave Radiometer [temperature and water vapor vertical profiles, integrated water vapour, liquid water content].
- (Tri-axial SODAR [wind vertical profile; **RSE**])
- Non-dispersive Infra-red (NDIR) analyzer [atmospheric CO₂].
- Gas chromatograph [atmospheric concentration of CH₄, N₂O, CFC-11 and CFC-12].
- Cavity ring-down spectroscopy analyzer (CO₂, CO, CH₄).
- Ozone UV analyzer [ozone concentration; **Agrigento Province**].
- Aerosol lidar [together with **University of Rome**; aerosol backscattering and depolarization profiles].
- Visible Multi Filter Rotating Shadowband Radiometer [MFRSR; aerosol optical depth at several wavelengths, diffuse-to-direct irradiance ratio, column water vapor, aerosol single scattering albedo].
- PM-10 aerosol sampler [daily chemical analyses performed at the **University of Florence**].
- Cimel sun photometer [aerosol optical depth and optical properties].
- Particle-Soot Absorption Probe [PSAP, aerosol absorption coefficient/soot concentration; **ISPL**].
- Aerosol total deposition [CARAGA collector; **LISA**].
- Middleton sun photometers [aerosol optical depth]

- Brewer MK III spectrophotometer [total ozone, spectral UV, aerosol optical depth].
- Precision Spectral Pyranometer/CMP21 [downward shortwave irradiance].
- Precision Infrared Pyranometer/CGR4 [downward longwave irradiance].
- Shaded Precision Spectral Pyranometer [diffuse downward shortwave irradiance].
- Photosynthetic radiation radiometer [downward photosynthetically active radiation].
- Actinic radiation spectrometer [actinic radiation spectra, photo dissociation rates].
- UV-Multi Filter Rotating Shadowband Radiometer [MFRSR; aerosol optical depth at several wavelengths, diffuse-to-direct irradiance ratio, UV irradiance].
- Total sky imager [cloud cover].
- IR camera [cloud base height].
- Water vapor Raman lidar [day/nighttime vertical profiles of water vapor, aerosol extinction (jointly with **University of Rome**)].
- ENEA gas sampling unit [weekly analyses of 15 different halogen compounds, made at ENEA, Rome].
- NOAA gas sampling unit [weekly analyses of CO₂, CH₄, SF₆, CO, ¹³C, H₂, ¹⁸O, made at **NOAA**].



WMO Global Atmosphere Watch
 NOAA Cooperative Air Sampling Network
 AERONET
 MWRNet
 Carboeurope

Continuous

CO₂, CH₄, CO
Picarro G2401
(Ultramat 6E)

Meteorological
parameters

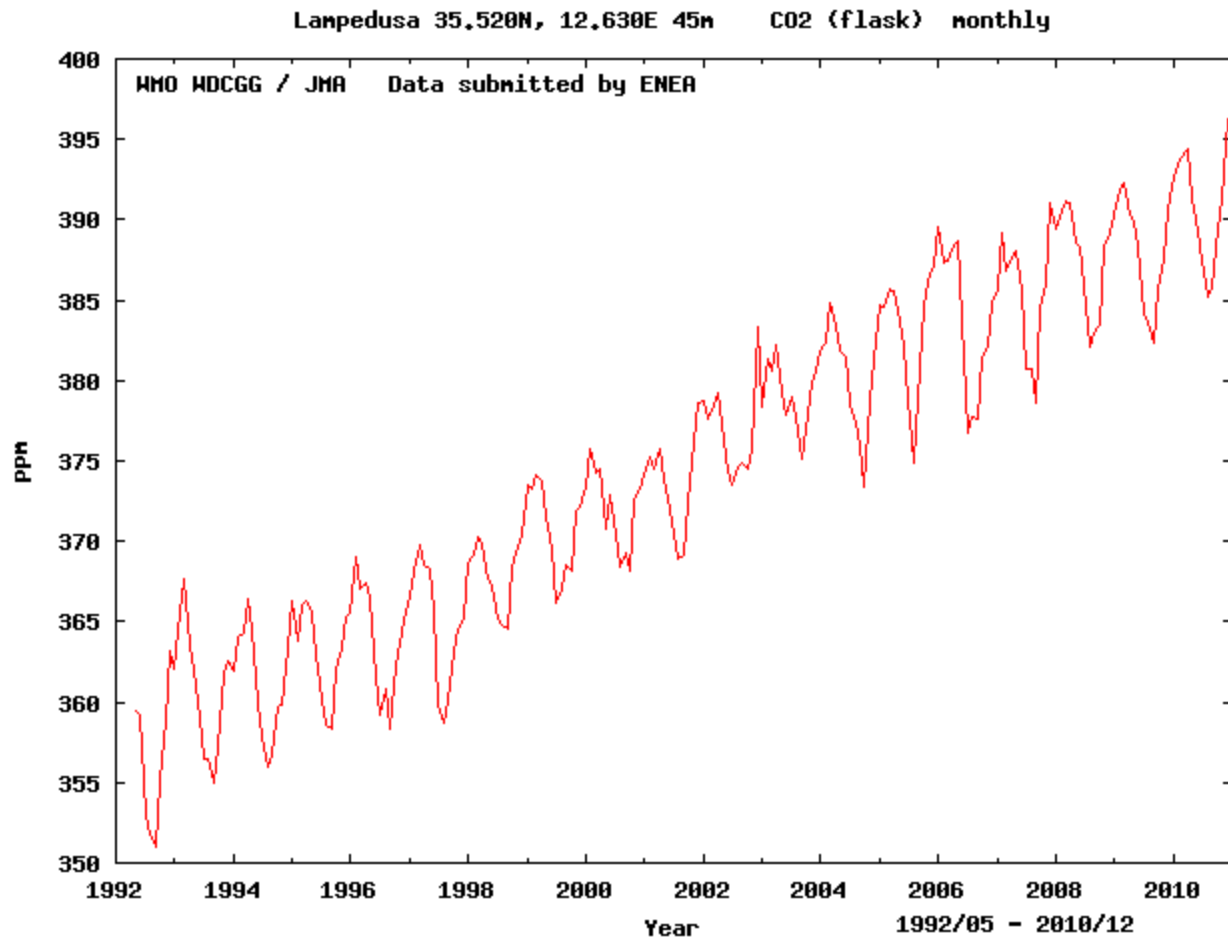
NOAA standards for CO₂
and CH₄; CO to be
acquired

Weekly

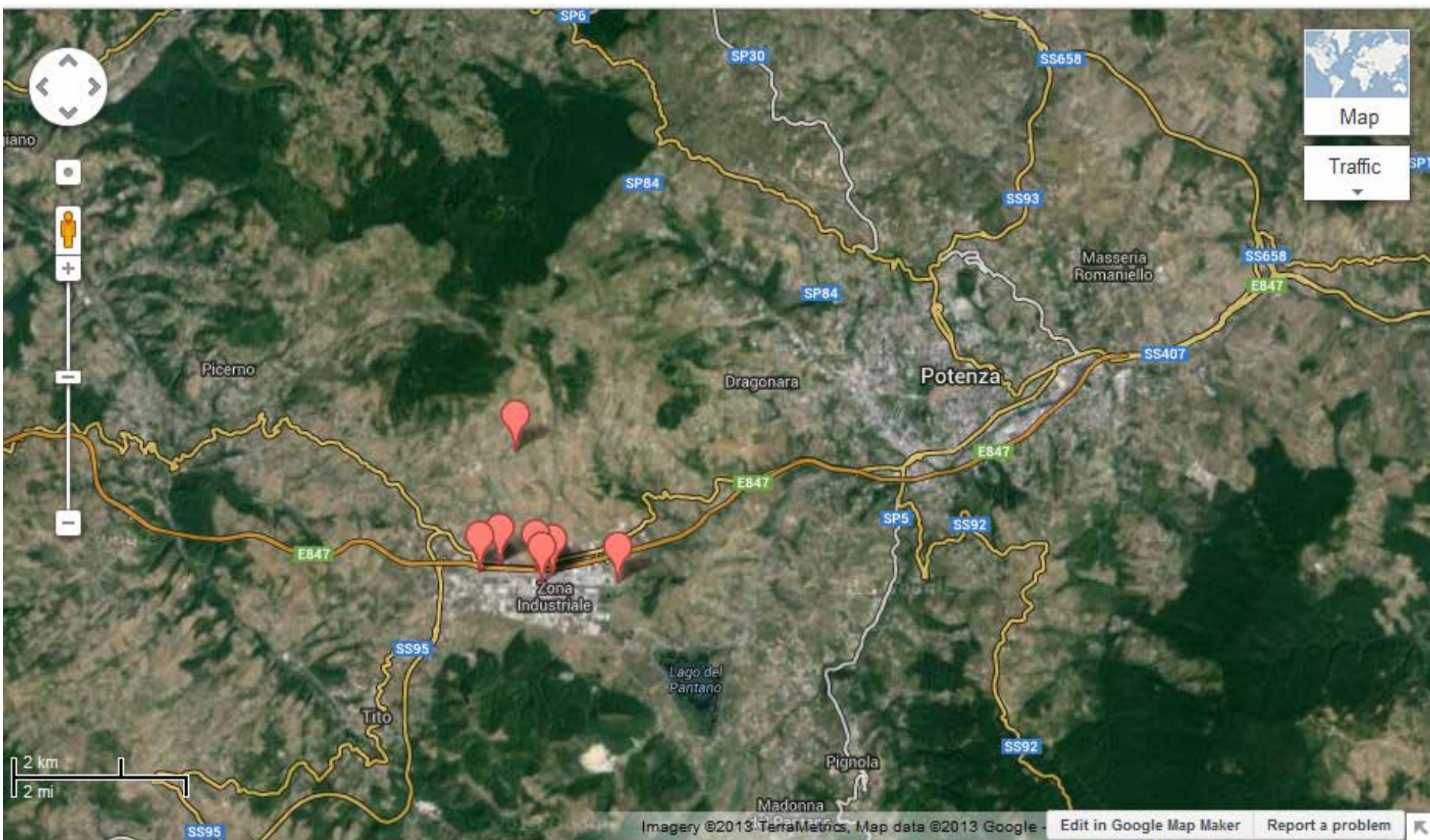
HCFC-22, HFC-134a, HCFC-141b, HCFC-142b, SF₆, CFC-113, CH₂Cl₂, CHCl₃,
CH₃Cl, CH₃I, CH₃Br, CH₂Br₂, CCl₄, CH₃CCl₃, Halon-1301, Halon-1211
GC-MS, Agilent 6890/5873N

+ NOAA analyses

NOAA standards for halogenated species



Tito Scalo, Potenza
760 m
40.6°N 15.7°E



CNR-IMAA Atmospheric Observatory (CIAO)

- Multi-wavelength Raman lidar for aerosol and water vapor
- Transportable multi-wavelength Raman lidar for aerosol
- Sun photometer
- Ka-Band Doppler radar
- Ceilometers
- Microwave profiler
- Surface radiation station
- GPS antenna/receiver
- Radiosounding systems
- Meteo station

Level 1 station

Summary

Pl. Rosa (Mountain station)	level 2
Mt. Cimone (Mountain station)	level 2
Lampedusa (Coastal? station)	level 1 * ^{14}C missing
Potenza (Continental? station)	level 1

Participation in ICOS requires a national program supporting observations, which is lacking (at least for the atmospheric sites)

National structure

Dario Papale/Riccardo Valentini Focal points
Giorgio Matteucci (Ecosystem)
Gelsomina Pappalardo (Atmosphere)
Anna Lucchetta (Ocean)