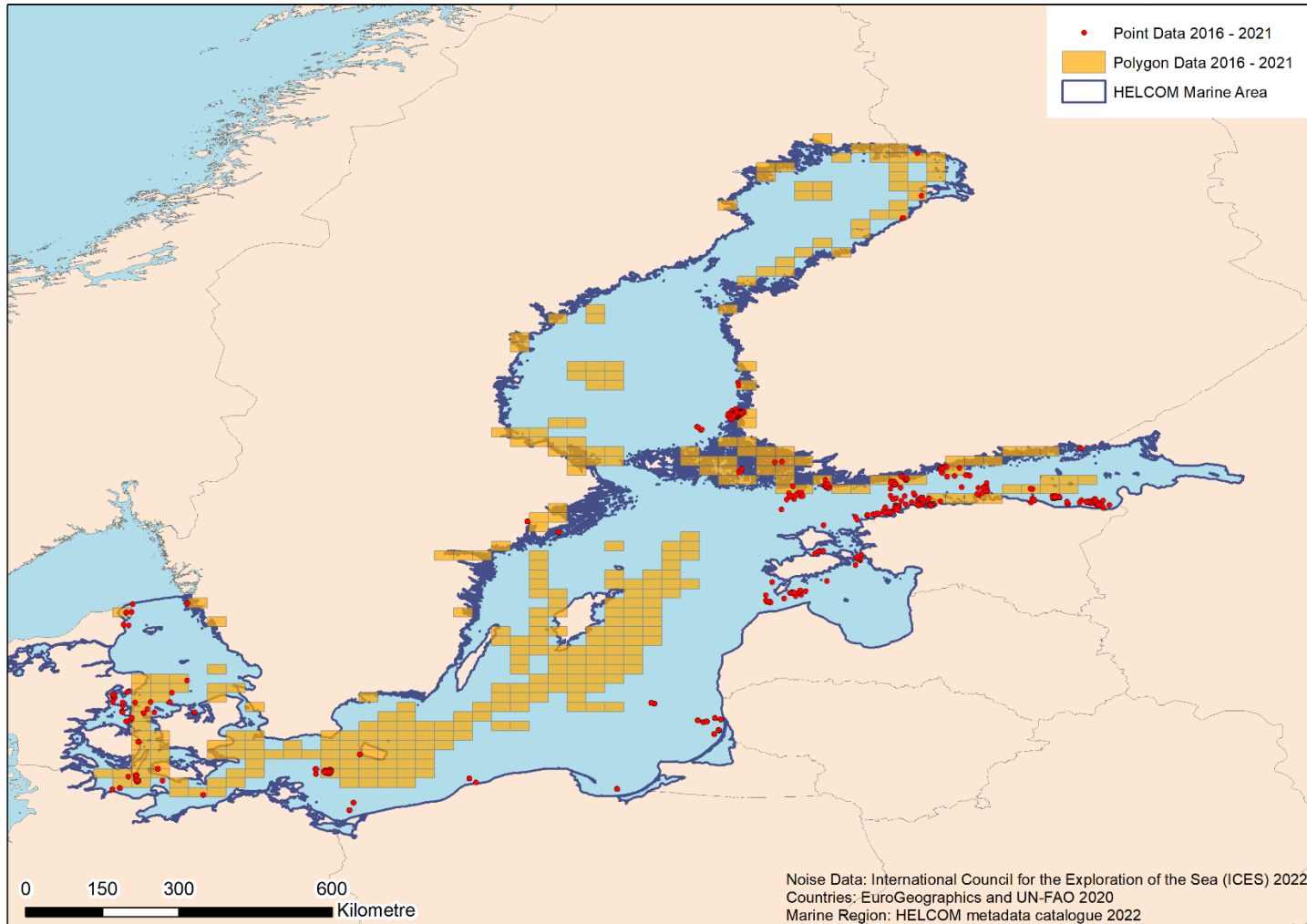


HOLAS 3 – Results and Lessons learned for Data Reporting



1st Informal Consultation Workshop on HELCOM and OSPAR Underwater Noise Data Upload

HOLAS 3: Impulsive Noise Indicator Results



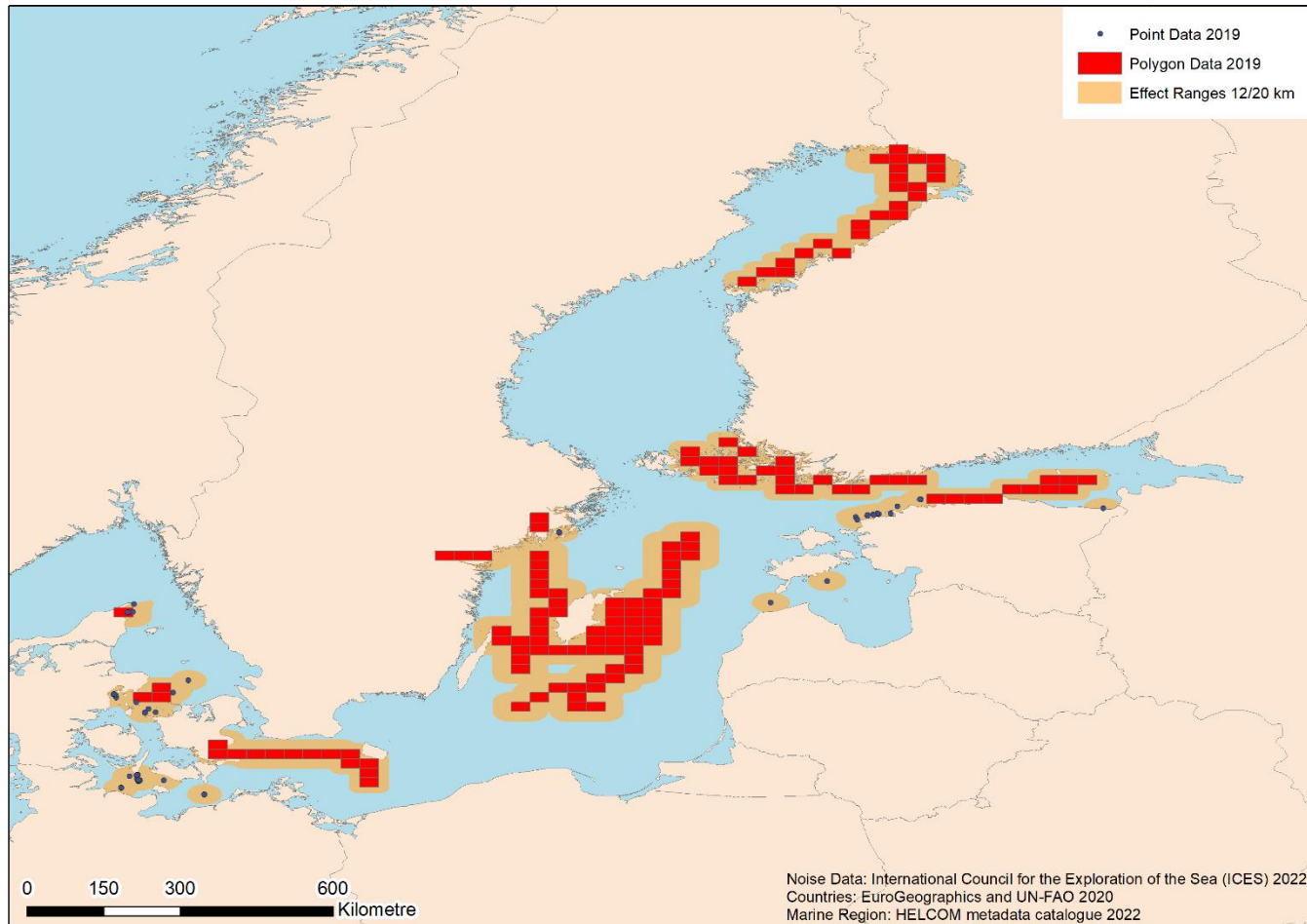
ICES-registry
reports

HOLAS 3: Impulsive Noise Indicator Results

Indicator analysis:

- Used information on: location, source type, start & end date, value code, sound mitigation Boolean
- Effect ranges applied according to source type and sound mitigation
- Events reported as ICES-rectangles: effect range applied around whole rectangle
- events reported as point coordinates: radius around point

HOLAS 3: Impulsive Noise Indicator Results



- Effect Ranges: area of disturbance of harbour porpoises around impulsive noise source
- Literature values for North Sea (none available for Baltic)

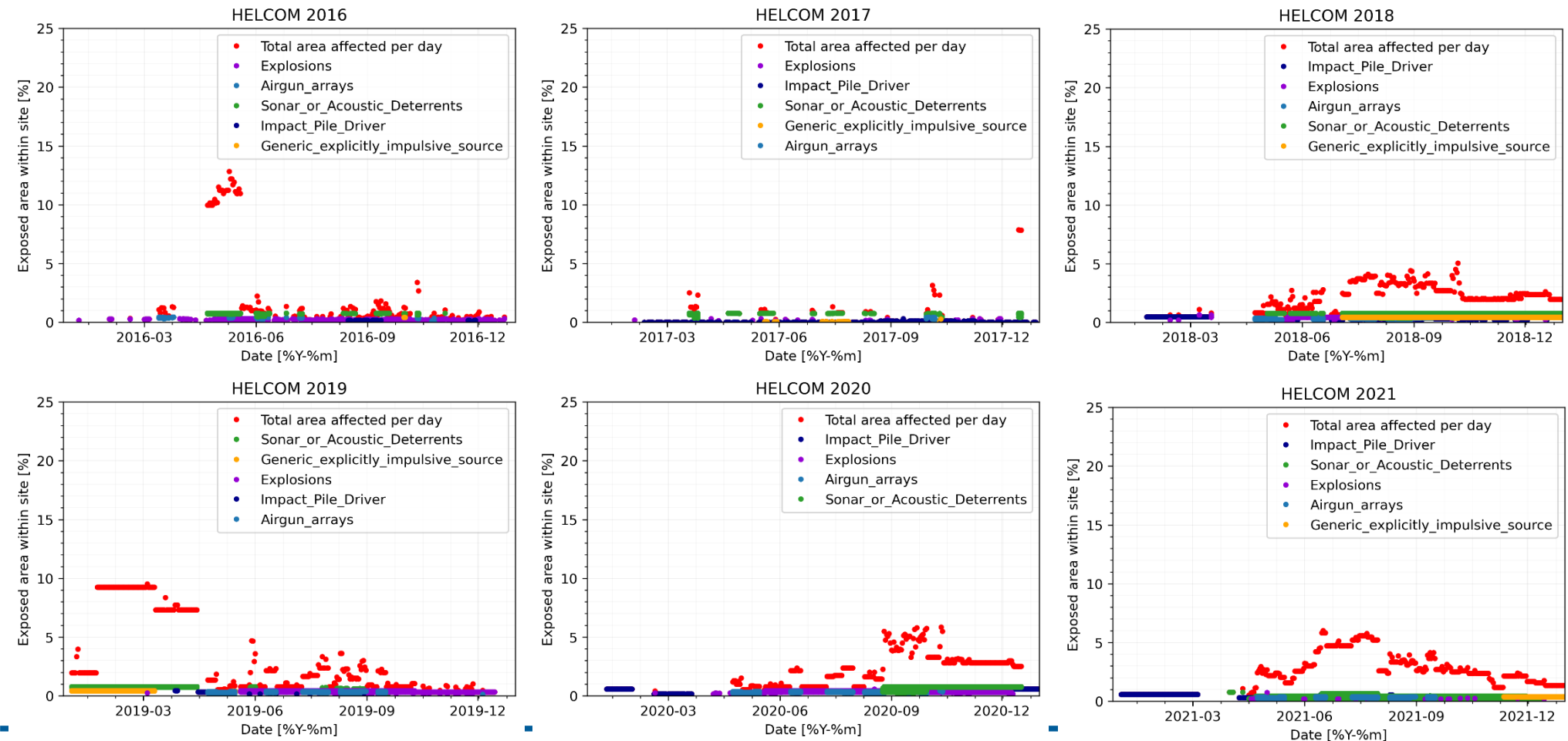
Source Event	Effect Range (km)
Airgun Arrays	12
Generic explicitly impulsive source	12
Impact Pile Driver mitigated	12
Impact Pile Driver non mitigated	20
Explosions	20
Sonar or Acoustic Deterrents	20

HOLAS 3: Impulsive Noise Indicator Results

- Sum of exposed area and fraction of HELCOM area was calculated per day
- Only mandatory information was used
- Rather rough estimate, not taking into account actual source intensities
 - may over- or underestimate exposed area

HOLAS 3: Impulsive Noise Indicator Results

spatial and temporal exposure



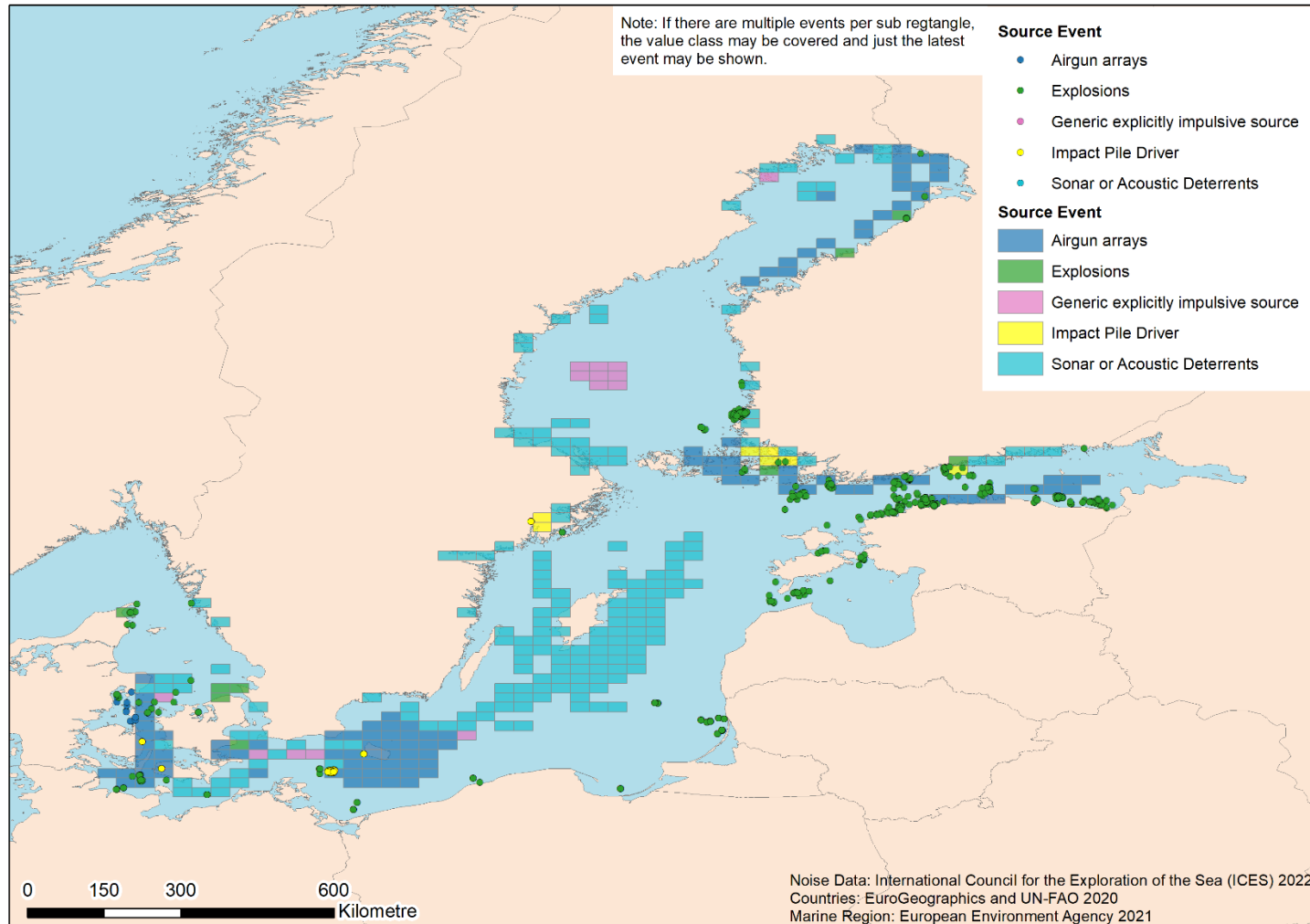
HOLAS 3: Impulsive Noise Indicator Results

Further analyses:

- Spatial (maps)
- Statistical
 - Based on events
 - Based on event days (separate each event into as many event days as event spanned)
- Analyses were by: source type, value code, sound mitigation Boolean, nr. of days per year and per month, nr. of events per year, event duration (in days), location (maps)
- Special focus analyses of some of these aspects (area south and east of Gotland, western Baltic)

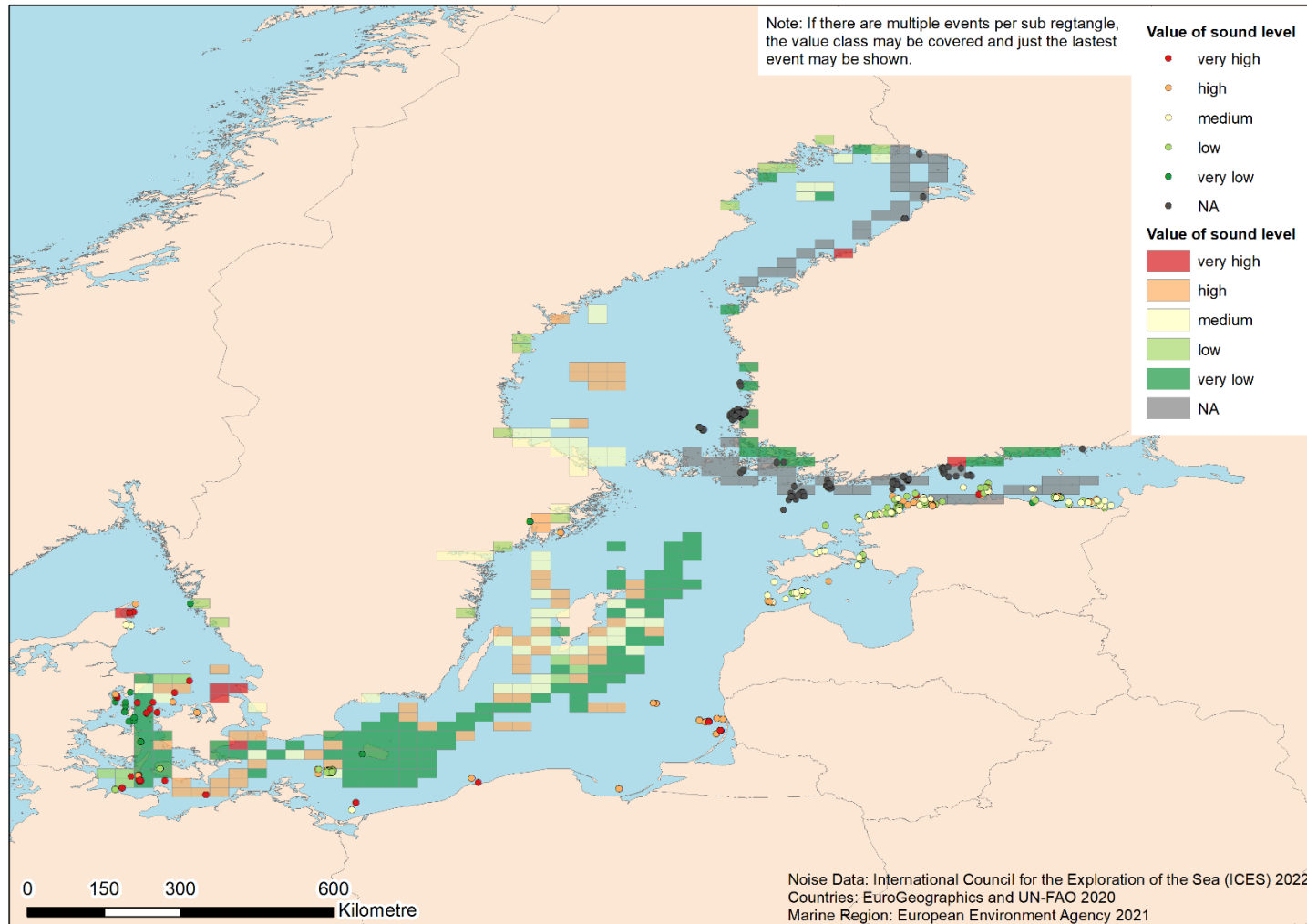
Event days: days
exposed to impulsive
noise

HOLAS 3: Impulsive Noise Indicator Results



Source type

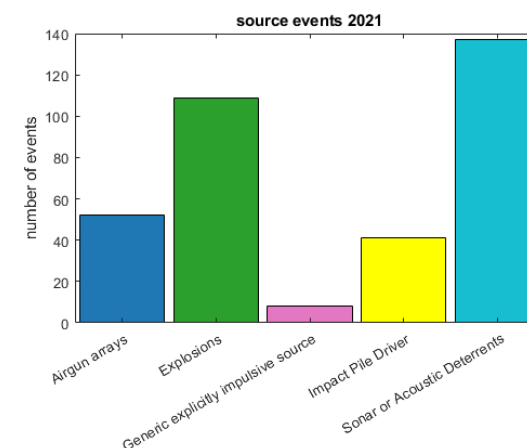
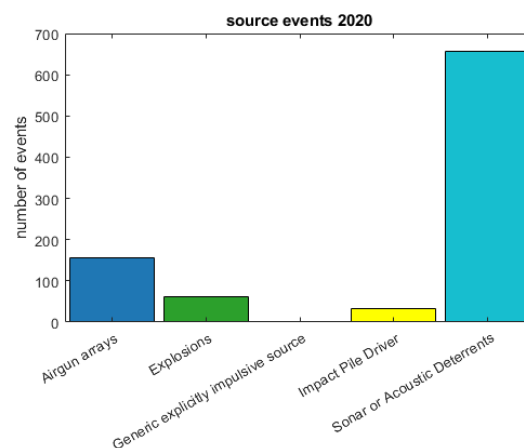
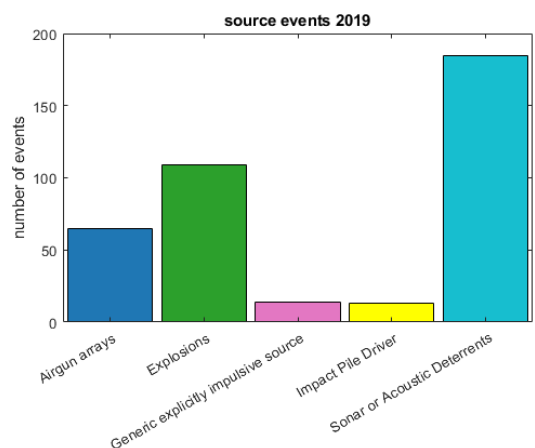
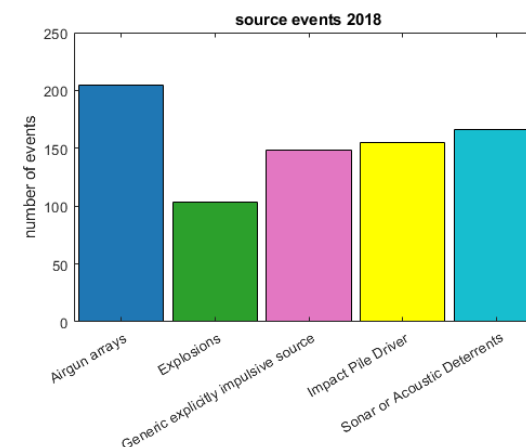
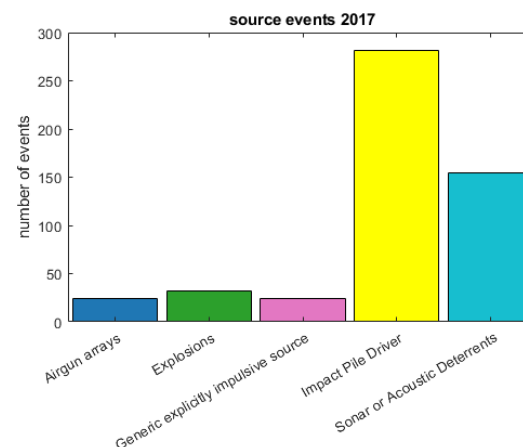
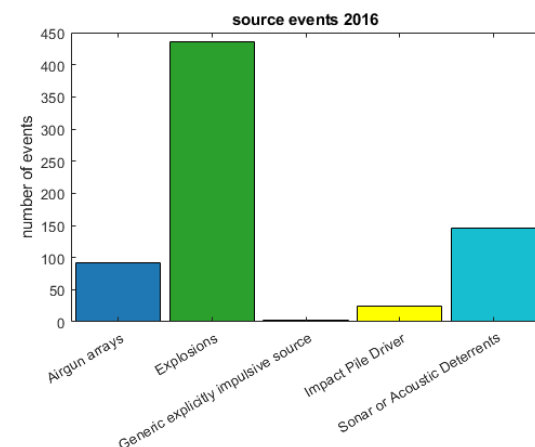
HOLAS 3: Impulsive Noise Indicator Results



Value Codes

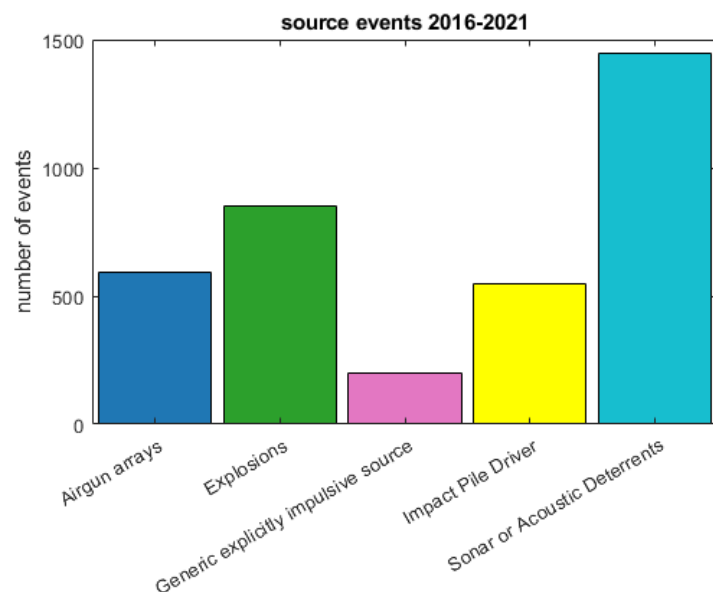
HOLAS 3: Impulsive Noise Indicator Results

Source type

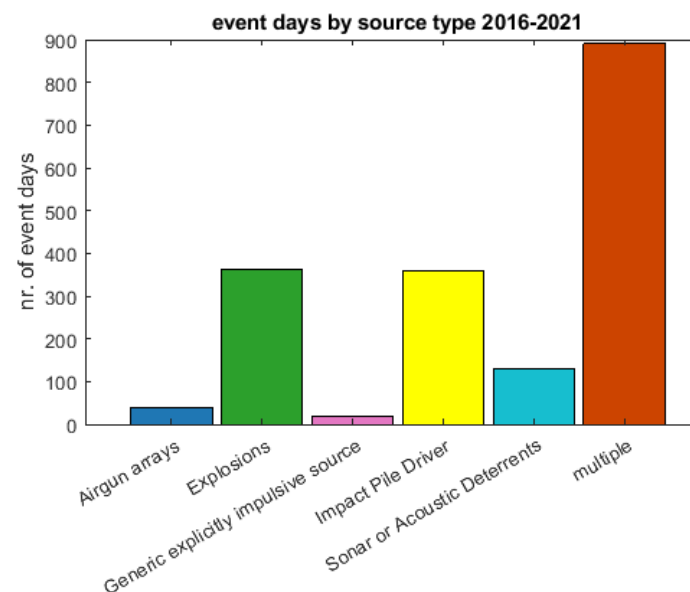


HOLAS 3: Impulsive Noise Indicator Results

Source type



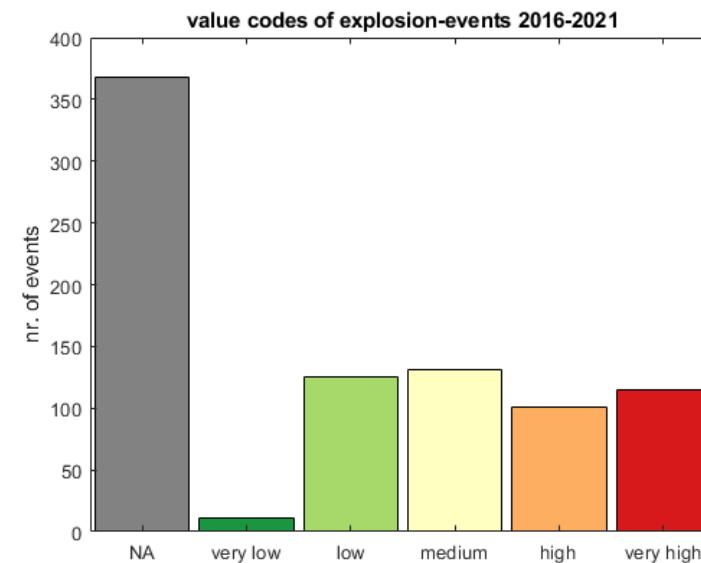
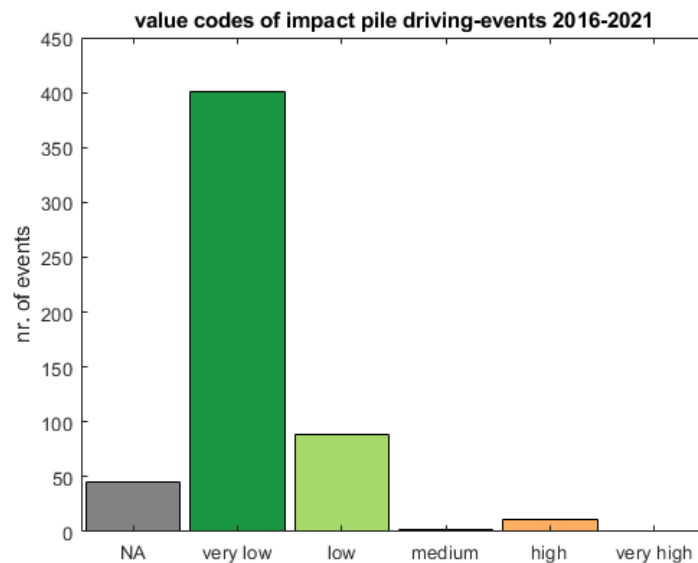
Events



Event days

HOLAS 3: Impulsive Noise Indicator Results

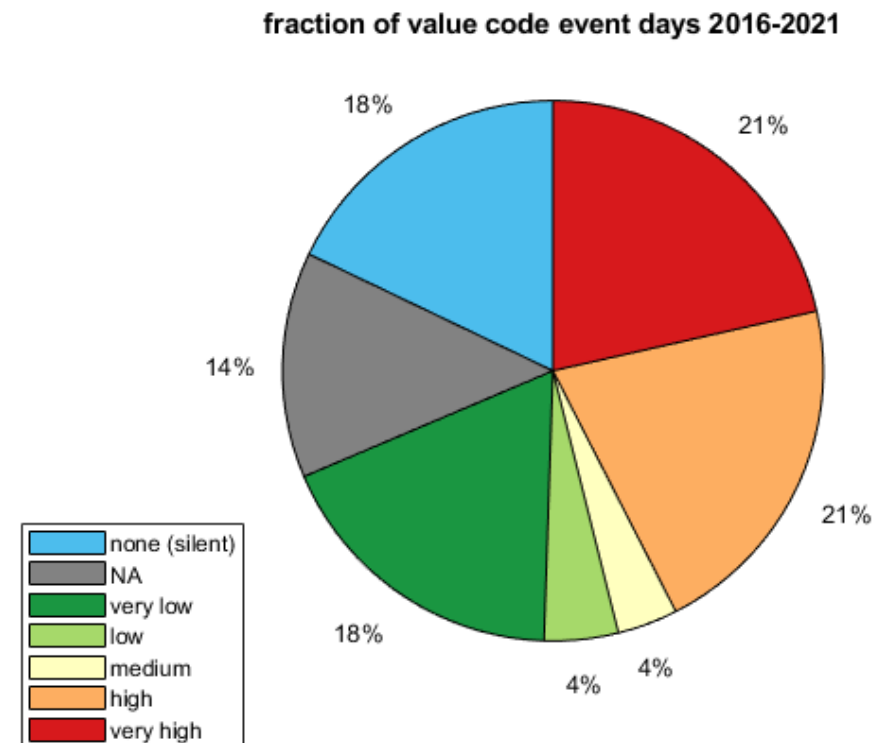
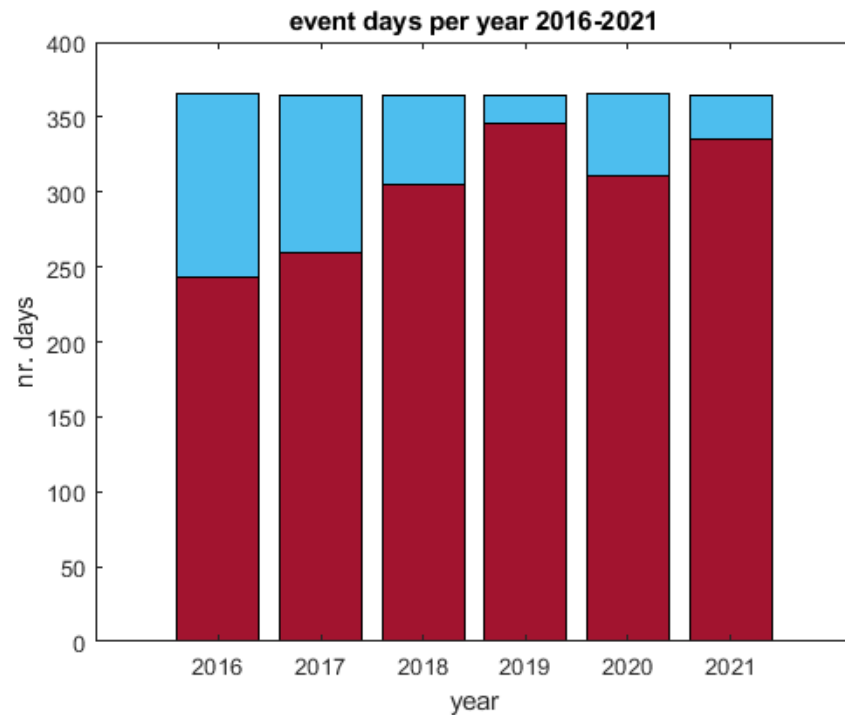
Value Codes



- many events without information on value code („NA“)
 - especially occurred for explosions

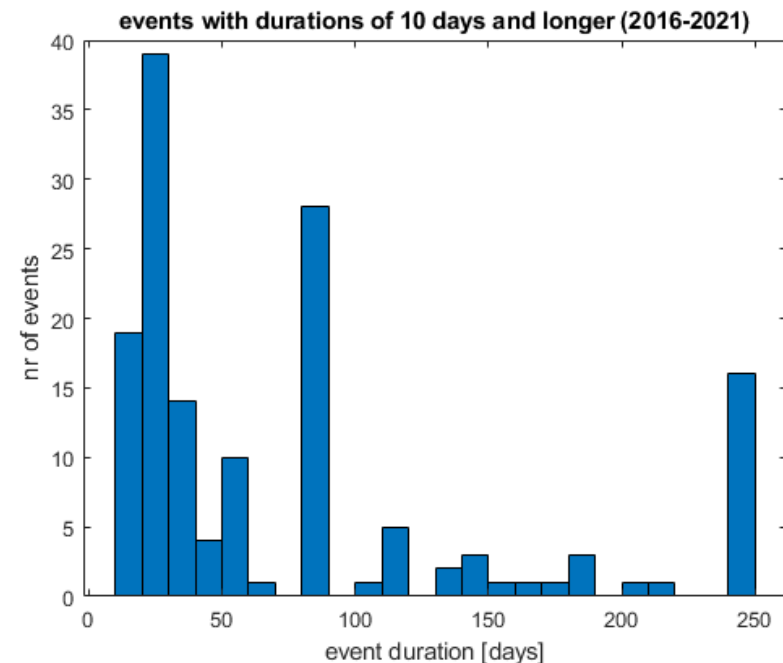
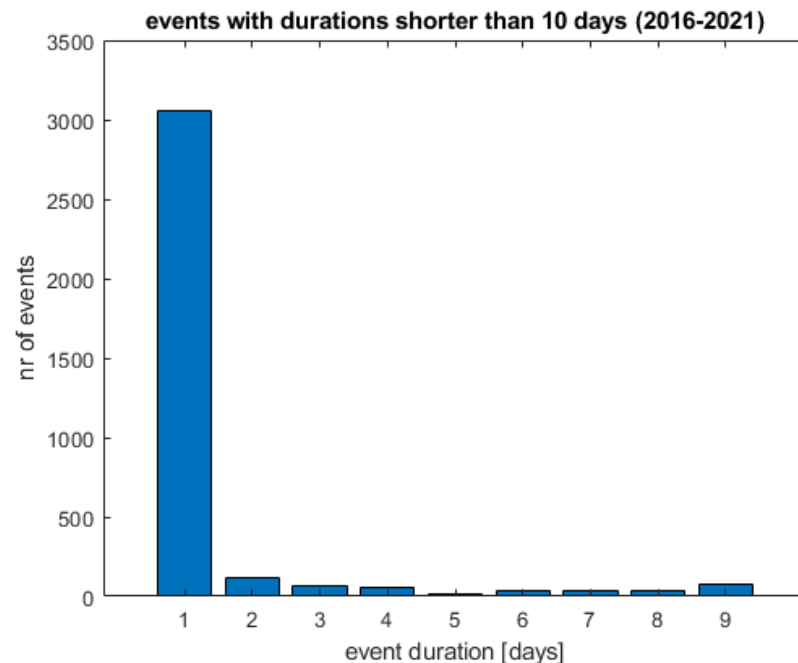
HOLAS 3: Impulsive Noise Indicator Results

temporal exposure



HOLAS 3: Impulsive Noise Indicator Results

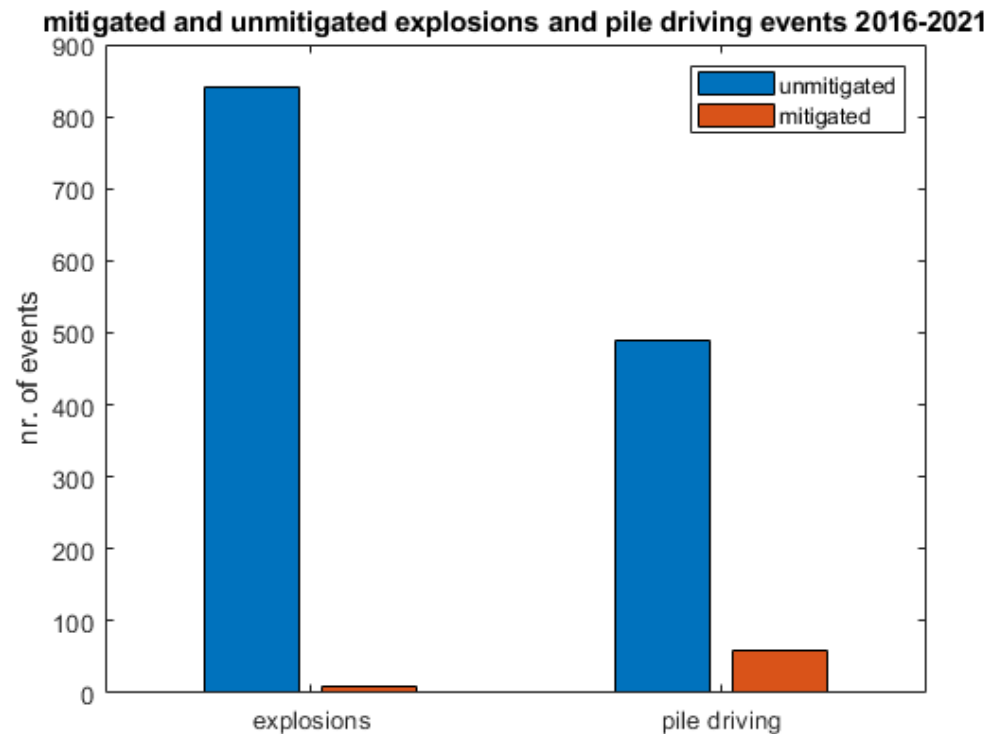
temporal exposure



Events >10 days mainly sonar or
acoustic deterrents

HOLAS 3: Impulsive Noise Indicator Results

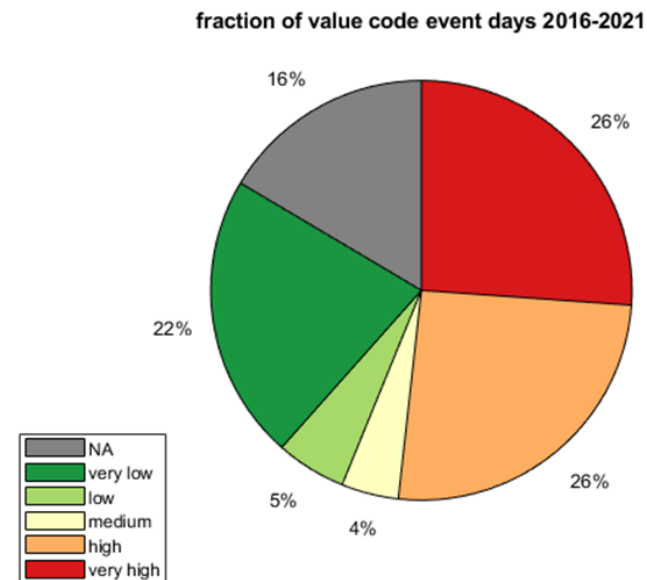
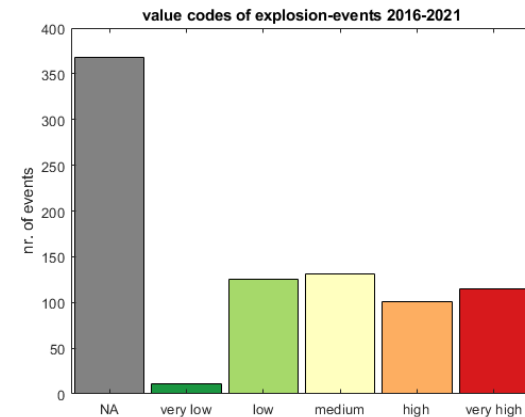
Sound mitigation



HOLAS 3: Lessons learned for Reporting

Value Code

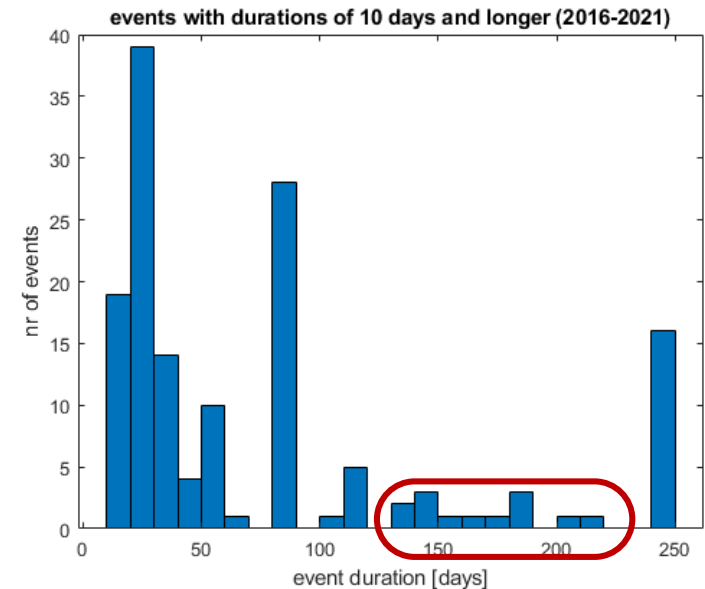
- Value code is important!
- Can e.g. be used to estimate the effect radius/exposed area in more precise analyses as using the fixed effect ranges of OSPAR
 - If the value code of an event is reported as N/A, assumptions have to be made → can lead to **strong under- or overestimation**
 - Many reported events of value code N/A made it difficult to draw conclusions regarding that parameter in statistical analysis



HOLAS 3: Lessons learned for Reporting

Date

- Important only to report dates, when an event actually took place in reported location
 - Even with long exploration campaigns that may span several ICES-rectangles it is important to only report those dates, where there was actually activity in the respective rectangle
 - In the past events with very long durations (up to several months) were reported, where it seems improbable that these would have been continuous operations over that time
 - Can otherwise lead to **overestimation of exposed days**



Some of these reported to
be pile driving and
explosions

HOLAS 3: Lessons learned for Reporting

Event

- Each event should be registered separately, even if they took place on the same day or at the same location/within the same ICES-rectangle
 - Example: pile installations with re-strikes, same pile is driven twice, several hours to a few days between → Even if same location, same pile report these as separate events (with event numbers ending on -1 and -2)

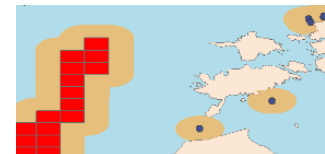
001036_003147-1	28062018	28062018	54,050835	6,484401 Point	Impact_pile_driver
001036_003147-2	28062018	28062018	54,050835	6,484401 Point	Impact_pile_driver

- Otherwise biases statistical analyses
- Otherwise can lead to **underestimation of exposure**

HOLAS 3: Lessons learned for Reporting

Location

- If possible: helpful to report stationary events (e.g. pile driving, explosions) as point coordinates, rather than ICES-rectangles
 - If reported as rectangle, whole rectangle assumed as exposed → may lead to **overestimation of exposed area**
 - Moving sources (e.g. seismic surveys) of course more sensible to report as ICES-rectangle



HOLAS 3: Lessons learned for Reporting

General remark

- The more parameters are reported, the better
- If sufficiently high number of events is reported with some of the optional parameters → becomes possible to analyze those too and draw (statistically relevant) conclusions
 - E.g. identify potential for noise reduction/mitigation, estimate relevance for animals, ...