Norway grants

Opracowanie i wdrożenie innowacyjnej usługi: Morskie badania ptaków migrujących z użyciem stabilizowanego radaru ornitologicznego

Cel i założenia projektu

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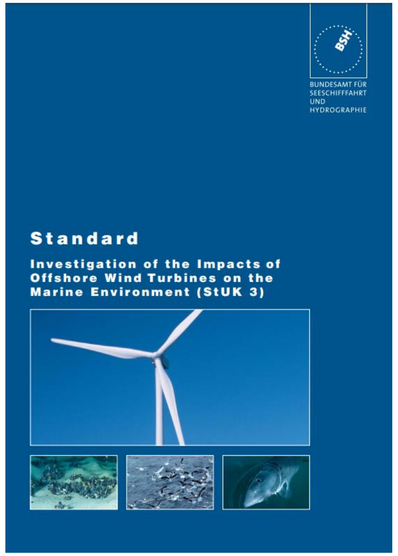
3BIRD

16.11.2021

Założenia projektu - Wymogi metodyczne

2007

https://tethys.pnnl.gov/sites/default/files/publications/Standard_Investigation_of_the_Impacts_of_Offshore_Wind_Turbines_on_the_Marine_Environment.pdf



3.2 Bird migration and other bird movements in the survey area

Table 3.2.1: Radar surveys

	Baseline survey		Monitoring	
	Preliminary investigations	Status assessment	Construction phase	Operation phase
Targets	Recording of bird movements (migration, foraging, flights between feeding and resting grounds).	Recording of status quo ante including seasonal dynamics.	Recording of effects on, and adaptive behaviour of, birds during the construction phase. Documentation of any evasive behaviour observed.	Recording of effects on, and adaptive behaviour of, birds during the construction phase. Documentation of any evasive behaviour observed.
Scope	Survey frequency in the main migration periods 7 days/month (not in a single block). *Main migration periods:* • North Sea: March to May, and mid-July to mid-November • Baltic Sea: March to May, and mid-July to the end of November • A survey day comprises 24 hours. The surveys should cover full 24-hour cycles in order to record bird migration and migration behaviour as evenly as possible in the course of a day. • At least 50 survey days are required in the North Sea, and 52 survey days in the Baltic Sea. During these periods, at least 900 survey hours in the North Sea, and 936 hours in the Baltic Sea, must be suitable for evaluation. Continuous deployment. In routine operaton, at least 12 to 15 radar images per hour. • The survey direction preferably should be perpendicular to the migration path.			
			Observation of flying birds' reaction to the turbines (changes in flight direction/altitude, collisions), to be recorded using state-of-the-art methods (representative samples).	
Timing	Once, may be used as part of the status assessment.	At least two consecutive complete annual cycles before the start of construction.	Throughout the construction phase.	At least three years, up to five years if required, after commissioning.
Method	**Radar surveys** (unless otherwise specified below, after Hüppop et al. [2002]) **Location** • Radar surveys should be made preferably at stationary locations, or alternatively on board vessels at fixed positions or moving slowly (in rough seas as they prevail in offshore sea areas, the ship will have to beat up and down in the survey area). During the construction and operation phases, the vessel or platform's location relative to the construction site should be in the direction from where most of the birds come to ensure optimal detection of the evasive movements of flying birds. **Vertical radar - mandatory use** • Quantification of flight intensities at 100-m steps up to an altitude of 1000 m, corrected. • Estimation of seasonal flight intensities. • Rough estimate of flight directions. *Survey conditions:* • Deployment also possible in stronger winds (up to min. 7 Bft or 2 m wave height) *Radar specifications:* • Vertical radar with an output of min. 25 kW, a vertical beam width of 20° to 25° and a horizontal beam width of 0.9° to 1.2°, and a transmission frequency of about 9.4 GHz (x-band radar). *Standard operating range:* • The standard operating range should be 1.5 km. Exceptions are only allowed to track, e.g., evasive behaviour of birds. **Surveillance radar - recommended use; mandatory during monitoring at fixed locations** • Recording of flight direction and intensities *Survey conditions:* • Max. 4 or 5 Bft *Radar specifications:* • Horizontally scanning radar with an output of min. 25 kW. *Standard operating range:* • The standard operating range should be 3 km. Exceptions are only allowed to track, e.g., evasive behaviour of birds.			
Presentation of results	Results of the radar observations. The altitude distribution requires a distance correction. (Comparability of results is essential in selecting equipment and making equipment settings). It takes into account the detectability and volume of the radar beam (see Annex, p. 49: distance correction for radar equipment and compare Hüppop et al. [2002] and next chapter). Results to be shown as echos per hour and kilometre.			

Table 3.2.2:

Targets
Scope
Timing
Method
Survey frequency: • As a minimum, a 15-minute recording period per hour has to be chosen, or preferably two 15-minute periods per hour.
Presentation of results
and altitudes, in tabular form.

Survey conditions

Vertical radar:
- **Wind Speed up to 7Bft**
- **or Wave height: up to 200 cm**

Survey conditions

Horizontal radar:
- **Wind Speed max 4 or 5 Bft (Wave height c.a. max 120 – 250 cm)**

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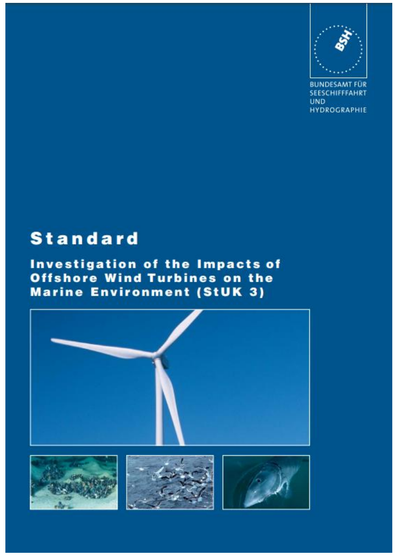
Założenia projektu - Wymogi metodyczne

2013

https://www.bsh.de/DE/PUBLIKATIONEN/_Anlagen/Downloads/Offshore/Standards/Standard-Investigation-impacts-offshore-wind-turbines-marine-environment_en.pdf?__blob=publicationFile&v=6



3.2 Migratory birds

Table 3.2.1: Radar survey.

	Baseline study	Construction phase	Operation phase
Objectives	Recording of bird movemen (migration, foraging, flights between feeding and resting grounds etc.).		play should be transferred with as little loss as possible to a pped with suitable software for the capture and evaluation of rveys, the recommended alternative is a fixed pencil beam dish aerial). Method and evaluation should be co-ordinated mann et al. 2013, Kulemeyer et al. 2011, Neumann et al.
Scope	Survey frequency in the mai Main migration periods: Ma In total, at least 50 survey d hours must be suitable for e A survey day comprises 24 24-hour cycles. The aim is t as possible in the course of	in the rotor area should be recorded using state-of-the-art methods (optical systems (e. g. p. 62), radar detection).	**Surveillance radar:** • Objective: Recording of flight direction and intensities. • Survey conditions: Depending on the ship's configuration, the surveys can be usually carried out in stronger winds of up to 3 Bft and at wave heights of up to 0.5 m. Platform based surveys can be carried out at even higher wave heights. • ~~Radar specifications: Horizontally scanning radar~~ with an output of min. 25 kW (x-band radar). Specifications see vertical radar. • Standard operating range: 3 km. Exceptions are only allowed for targeted observations (evasive behaviour). • Comparability of results is essential in selecting equipment and making equipment settings.
Timing	At least two consecutive complete seasonal cycles prior to the start of construction.	Throughout the entire construction phase.	At least three years, up to five years if required, after commissioning.
Method	Radar surveys (after Hüppop et al. 2002) to be carried out for determining migration intensity and flight altitudes. Location: If a platform is available that is suitable with regards to location and equipment (e. g. FINO, USPW), surveys should be carried out from the platform; otherwise, ship based surveys exclusively at fixed positions (e. g. anchoring buoy). A fixed position is obligatory for cluster studies. The location for ship based surveys should be chosen relative to the wind farm in the direction from where most of the birds come to ensure optimal detection of the evasive movements of flying birds. **Vertical radar:** • Objective: Estimation of seasonal phenology of flight intensities. • Quantification of flight intensities at 100-m steps up to an altitude of 1,000 m, corrected. During construction and operation phase, migration rates must be assessed ~~especially in the rotor area of wind turbines~~. • Survey conditions: Depending on the ship's configuration, the surveys can be usually carried out in stronger winds of up to 7 Bft and at wave heights of up to 2.5 m. Platform based surveys can be carried out at even higher wave heights. • ~~Radar specifications: Vertical radar with an output of min. 25 kW, a vertical beam~~ width of 20° to 25°, a horizontal beam width of 0.9° to 1.2° and a transmission frequency of about 9.4 GHz (x-band radar). The antenna's plane of rotation should preferably be aligned vertical to the assumed migratory direction. • Standard operating range: 1.5 km. • Comparability of results is essential in selecting equipment and making equipment settings. The filter for sea clutter (SEA) and rain (RAIN) should be set at 0. The GAIN filter should be determined individually for each radar device. Principally, the highest possible GAIN should be used, to avoid disturbance in the radar image. Identical radar device settings should be maintained throughout the entire assessment period.		

Survey conditions

Horizontal radar:

- **Surveys can be usually carried out in wind Speed up to 3 Bft (Wave height up to 50 cm)**

Survey conditions

Vertical radar:

- **Wind Speed up to 7Bft**
- **Wave height: up to 250 cm**

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Cel projektu:

Wdrożenie w przedsiębiorstwie i wprowadzenie na rynek innowacyjnej usługi oraz rozwiązań technologicznych dzięki wzmocnieniu współpracy z firmą Norweską oraz ograniczenie nierówności ekonomicznych i społecznych w obrębie Europejskiego Obszaru Gospodarczego.

1. Partnerstwo z Norweską firmą Stable

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2. Innowacyjna technologia

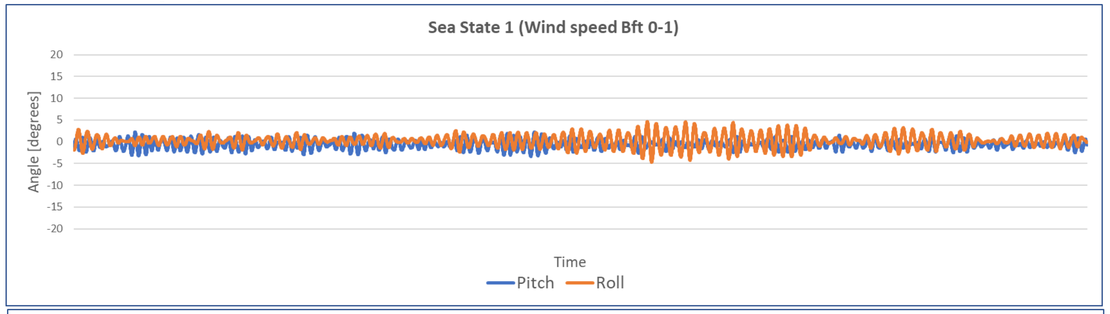
Innowacyjne zintegrowanie technologii morskich stabilizowanych platform z technologią pomiarów radarowych ptaków migrujących.

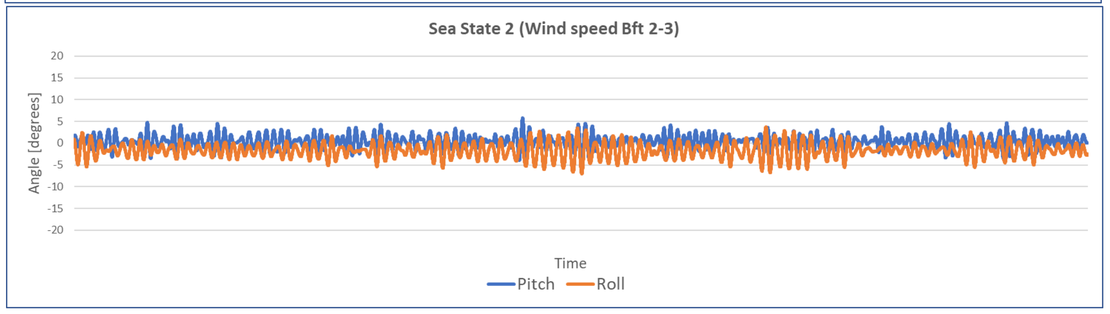
3. Innowacyjna usługa

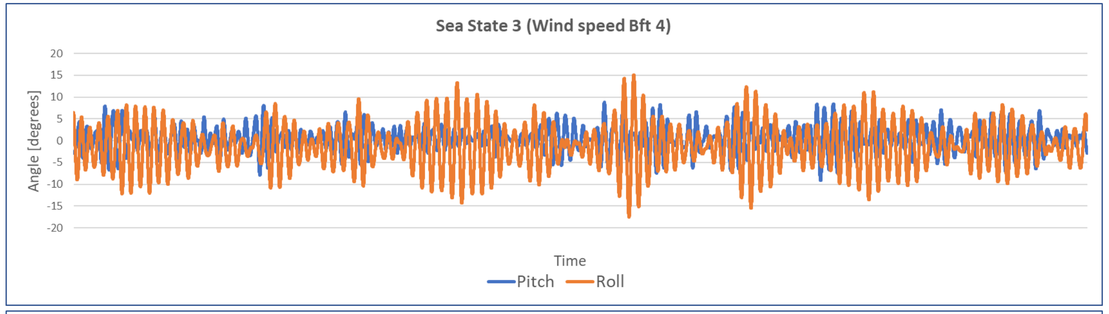
Innowacyjna usługa badania ptaków migrujących z użyciem stabilizowanego radaru ornitologicznego na statkach badawczych.

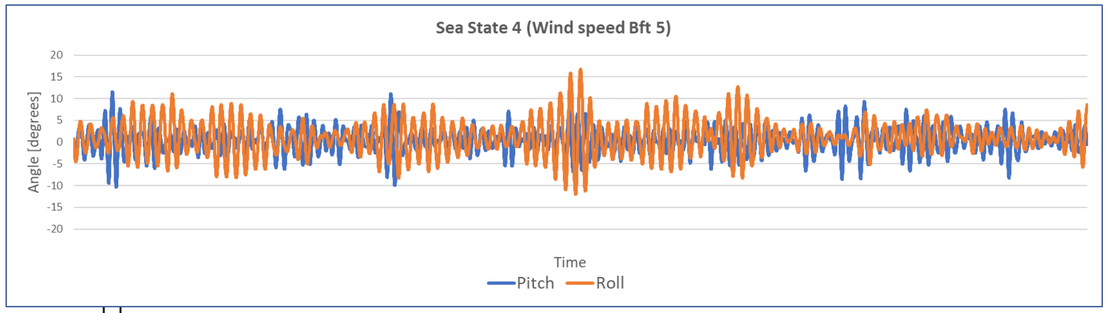
Z uwagi na to, że nie znane jest wdrożenie tego typu rozwiązania w badaniach ptaków migrujących, wnioskowana innowacja będzie miała charakter innowacji światowej.

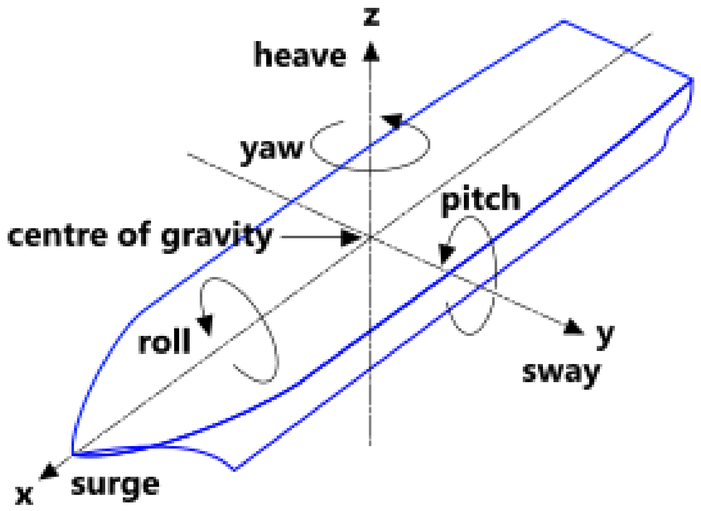
Przechyły statków badawczych w zależności od stanów morza



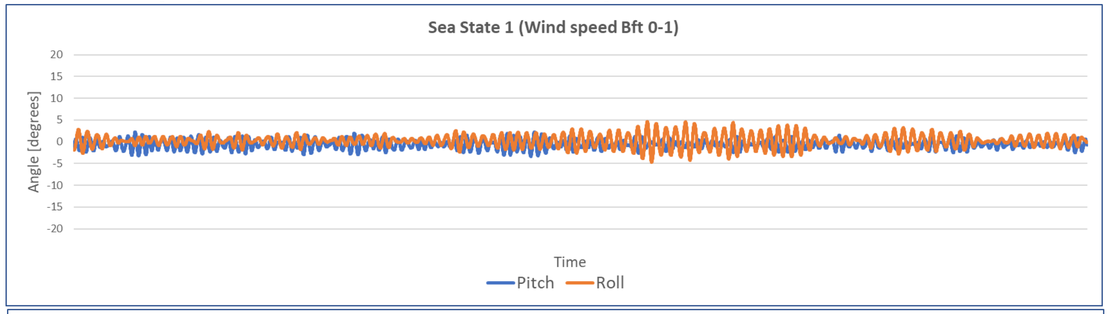


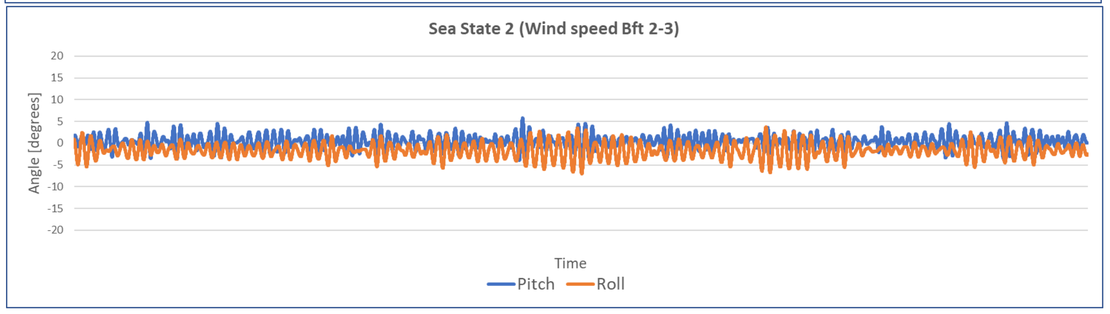


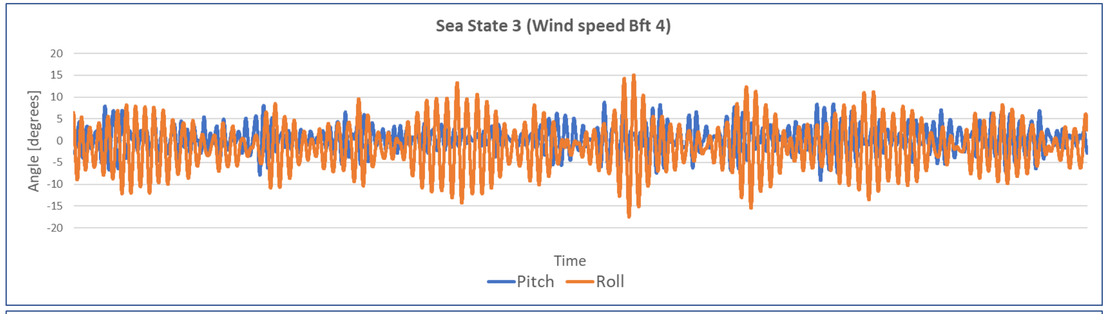


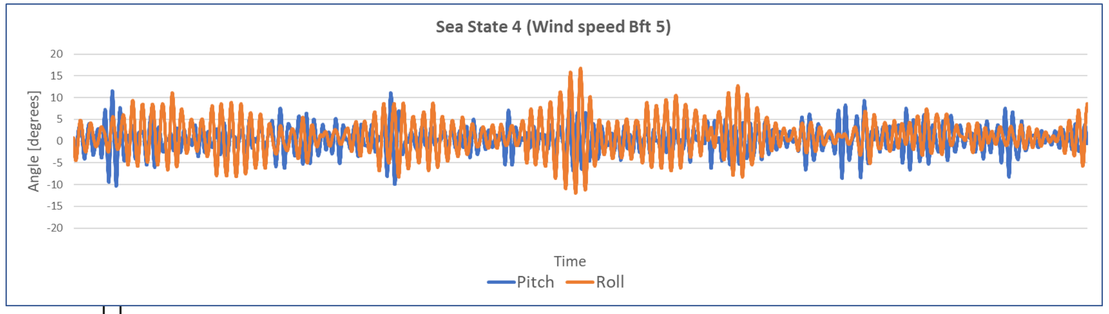


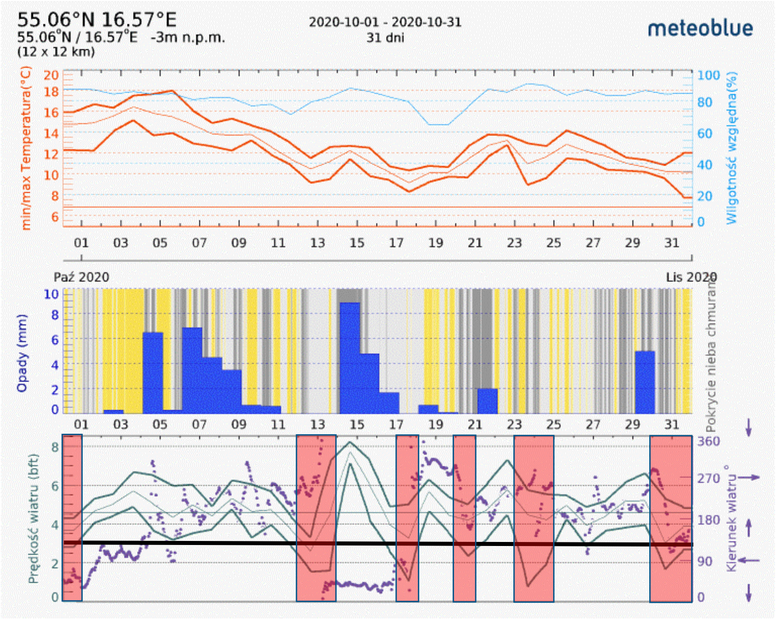
Przechyły statków badawczych w zależności od stanów morza



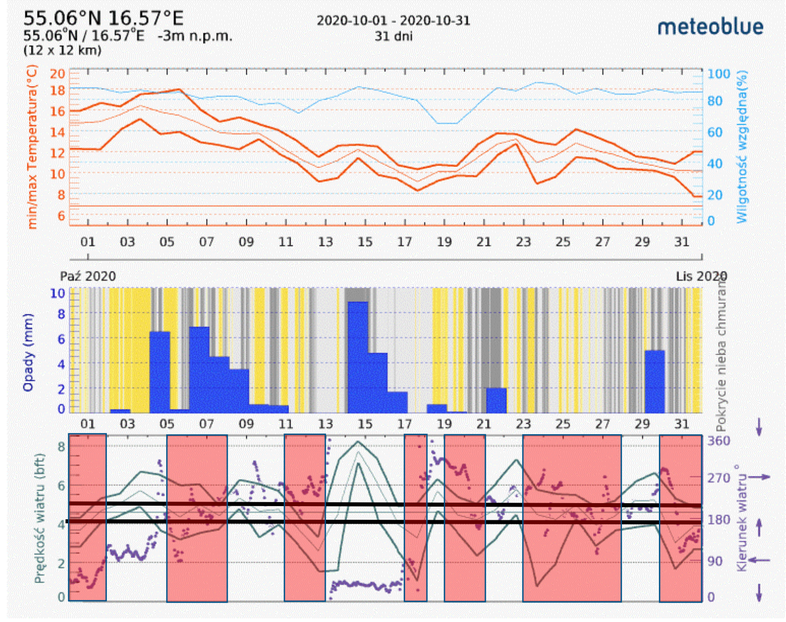








8-9
dni badawczych



16-17
dni badawczych

Cele poznawcze - podsumowanie

Zwiększenie stanu wiedzy o charakterystyce migracji ptaków w wyższych stanach morza tj. od 3 do 4 w Skali Douglasa

Poprawie jakości wyników badań ptaków migrujących w stanach morza do 4 w Skali Douglasa

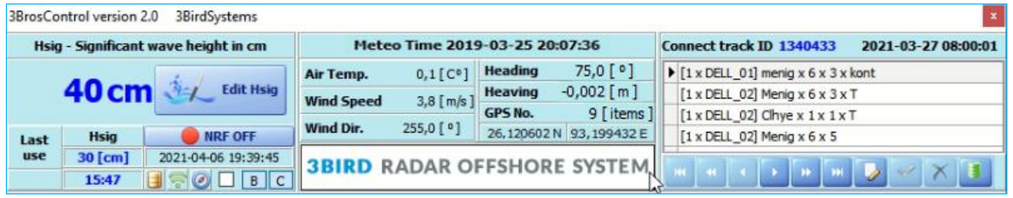
Możliwość realizacji badań z większą częstotliwością próbkowania poprzez możliwość prowadzenia badań w wyższych stanach morza

Założenia projektu

Zadania w projekcie

Zadanie A. Wydatki inwestycyjne.

Zadanie A1. Aktualizacja oprogramowania 3BROS CONTROL© do funkcjonalności użycia w innowacyjnej usłudze



Zadanie B. Opracowanie projektu i wykonanie platformy stabilizującej radary ornitologiczne oraz konstrukcji łączącej platformę z systemem radarowym.
Opracowanie projektów platformy stabilizującej i konstrukcji łączącej platformę stabilizującą z systemem radarowym zostanie wykonane w ramach współpracy Wnioskodawcy (3Bird) i partnera projektu (Stable).

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Zadanie C. Badania jednostki stabilizowanego radaru ornitologicznego przez niezależny instytut badawczy.

Integracja komponentów software i hardware

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Na każdym etapie projektu dbamy o Jakość, Zdrowie, Bezpieczeństwo i Środowisko

100%

Q H S E

Quality Health Safety Environment

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