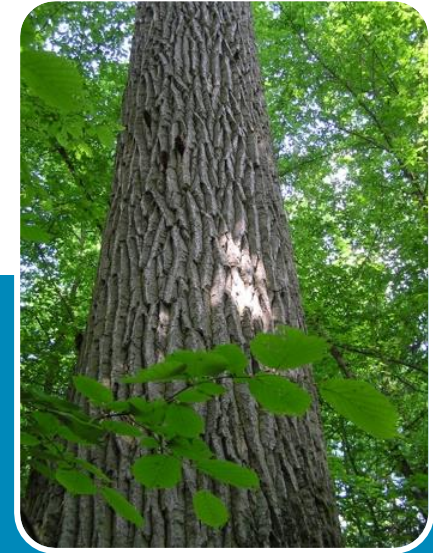




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RESEARCH PROGRESS, POTENTIAL CONTENT AND CHANNELS OF FUTURE COOPERATION FROM CEECS' PERSPECTIVES ON FOREST ECOLOGY, ENVIRONMENT AND PROTECTION

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Forest ecology, Environment and Protection

Forests are the basis for a sustainable and healthy planet as they provide many environmental services which are crucial for the well-being of living things.

Forests:

- have a positive impact on **global and local climate**,
- regulate the **water cycle** in nature
- contribute to the **prevention of floods, avalanches and landslides**,
- protect soil **against erosion** and landscape against steppisation,
- contribute to **biodiveristy conservation**





Global statistics for forest environmental services

In 2015 forests absorbed and stored **296 Gt of carbon**

1015 million ha of forests have been designated for soil and water protection

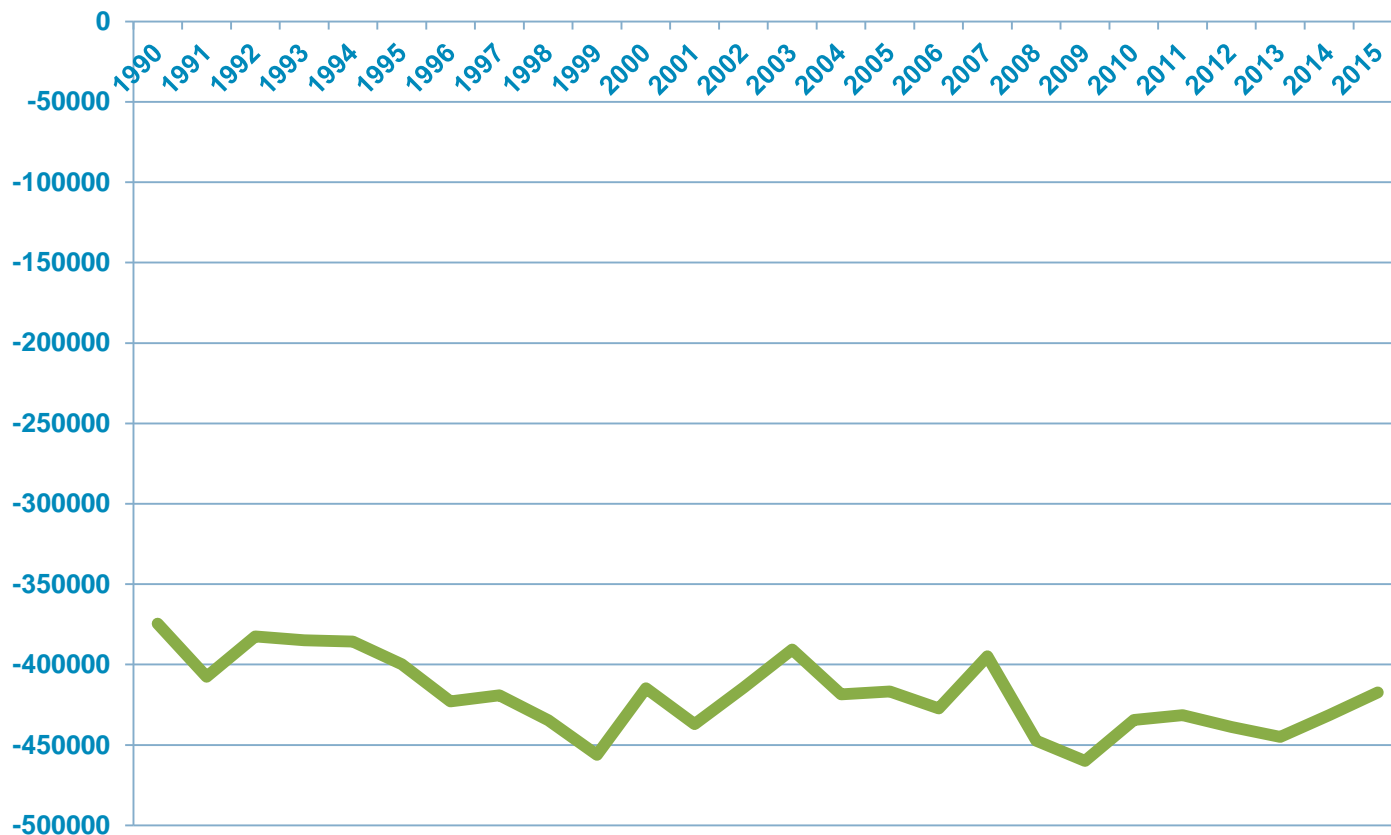
13% of forests are designated for biodiversity conservation, over **520 million ha** has been designated for biodiversity purposes. There are also **651 million ha** of forests within protected areas

93% of forests are natural, 7% are planted





Removal of carbon dioxide in the EU



Source: National Inventory Report to the UNFCCC, 2017.



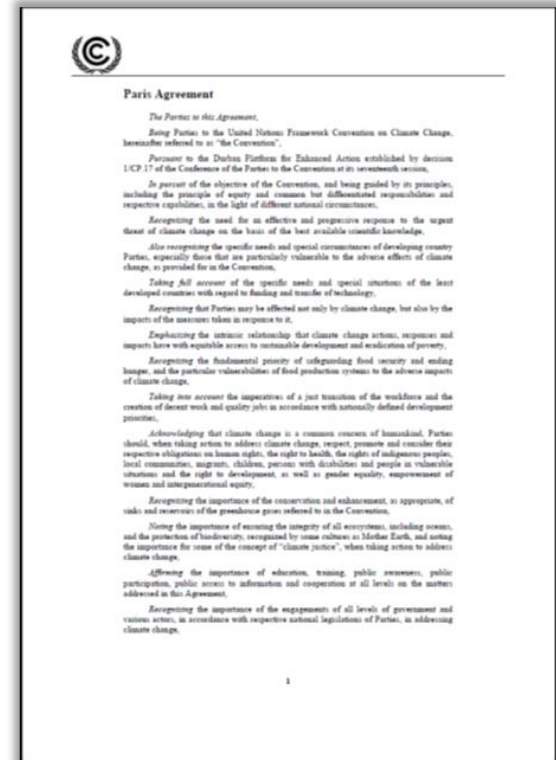
The Paris Agreement (PA) and forests

Reference to the LULUCF sector, in particular forests, in the Paris Agreement (PA) is an important sign for researchers.

The PA emphasizes emission reductions as well as the **enhancement of removals** as a way to combat climate change.

The PA also underlines the important role of forests as a climate change mitigation option.

But how to enhance the removals of forests?





Forest Carbon Farms Project (FCF Project)

Directive no 2 of the Director-General of the State Forests' dated 17th January 2017 regarding the implementation of a developmental project called Forest Carbon Farms, implemented as a joint venture of the State Forest organisational units.

Goals and directions:

- ✓ expression of the role of **forest areas** in mitigating the negative effects of climate change in the context of international agreements;
- ✓ **storage** of additional organic carbon in separated parts of the forest;
- ✓ **verification** of the effectiveness of additional measures to increase CO₂ retention;
- ✓ creating a CO₂ absorption **model** by Polish forests;
- ✓ Introduction of the **trading system** for CO₂ units to the economic practice
- ✓ **a research program** constituting an integral part of the FCF Project

• **Project implementation - the first quarter 2017**

Costs of Project – The State Forests Forest Fund.

Pilot Project, including both additional activities in forest areas and **scientific research**



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Actions in forestry in the context of climate protection

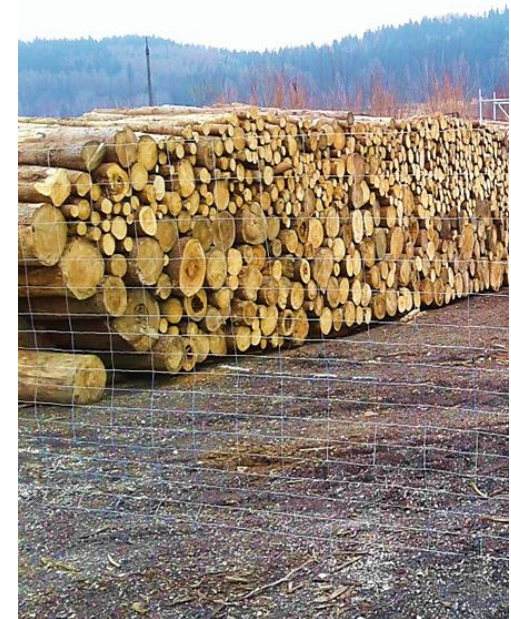
FCF Project



Additional activities
in the forest



Active protection of wetlands



Energy wood yards



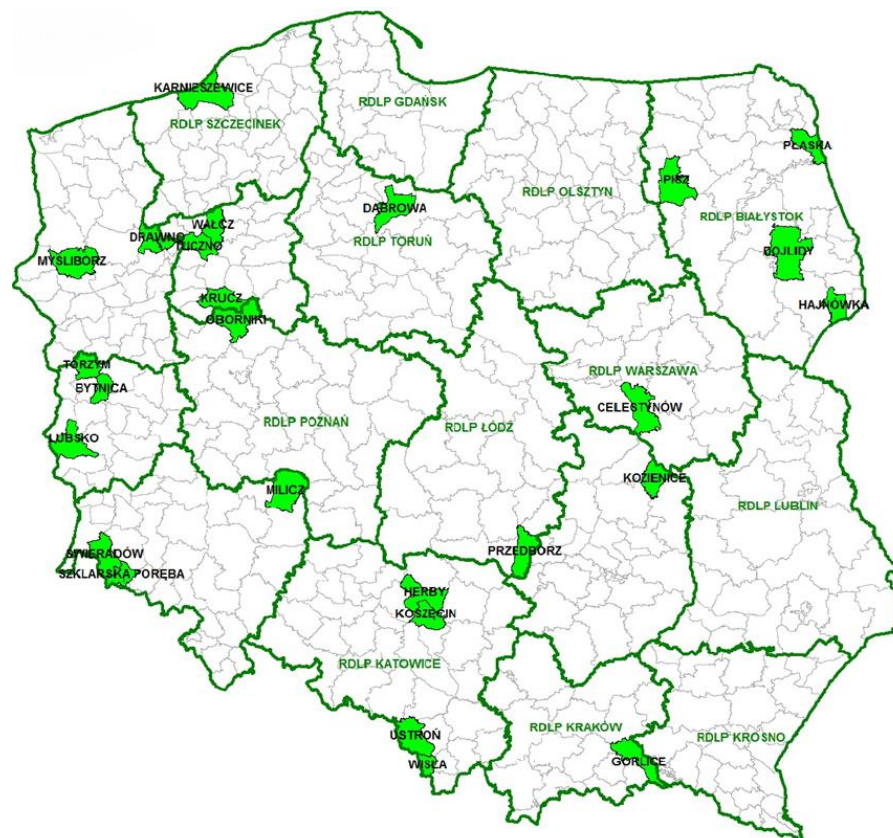
Project development 2017-2026

- preparation of list and spatial scope of activities for Forest Carbon Farms project
 - inventory of carbon in Polish forests
 - creating a carbon balance model for Polish forests,
 - assessment of effectiveness of additional activities with regard to absorption
 - granting marketing authorization for carbon dioxide units
- **after 2026:**
- establishing other areas within FCF project
 - the settlement of generation process and the sales of units of the absorbed CO².



Forest districts participating in the Project

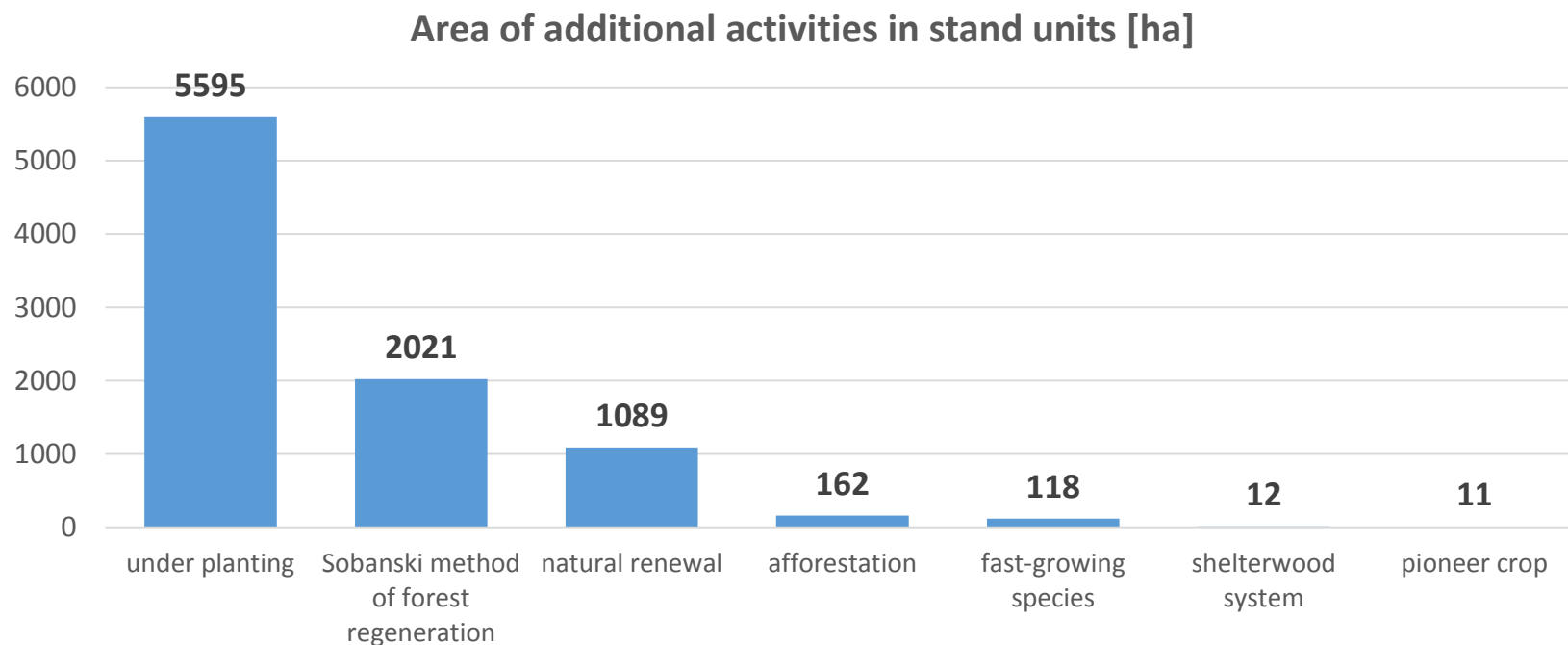
Forest district	Number of stand units	Area [ha]
Bytnica	423	1134,58
Celestynów	210	823,9
Dąbrowa	254	627,55
Dojlidy	145	517,14
Drawno	120	577,7
Gorlice	44	88,65
Herby	73	214
Karnieszewice	163	381,85
Koszęcin	107	318,75
Kozienice	82	333,38
Krucz	115	401,55
Lubsko	182	457,66
Milicz	97	356,64
Myślibórz	48	91,78
Oborniki	126	431,22
Plaska	52	230,33
Przedbórz	148	323,07
Torzym	118	231,13
Tuczno	51	242,82
Ustrón	90	369,76
Wałcz	127	588,86
Wisła	66	265,52
TOTAL	2841	9007,84





Additional activities in stand units

Aiming at the accumulation of additional amounts of carbon in strictly defined layers of the forest

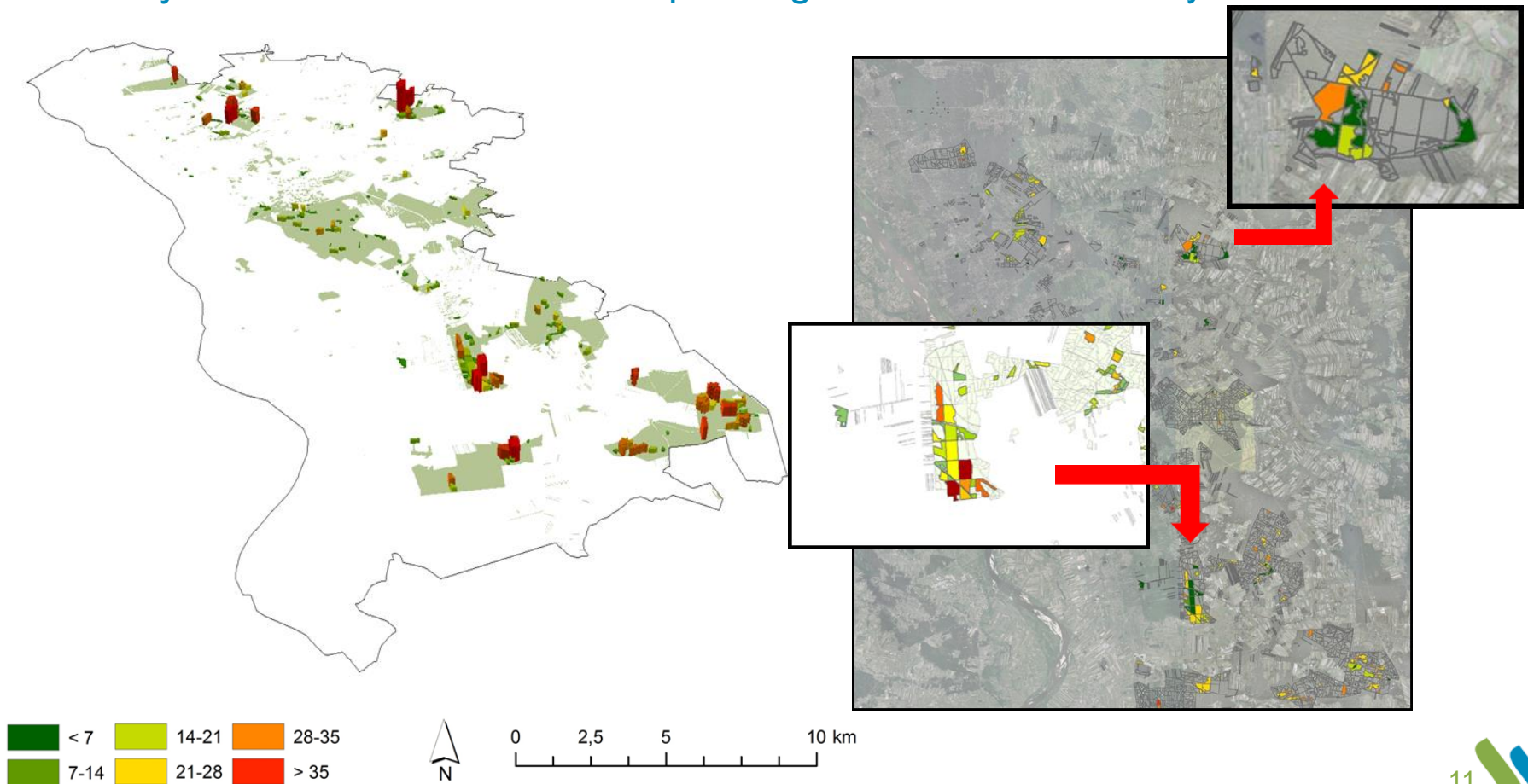


Estimation of predicted extra-carbon (LGW and REF) absorbed quantities will be carried out using appropriate tools (CBM and others).



Simulation example showing the effect of additional activities using the CBM

Celestynów Forest District – underplanting of beeches after 25 years





First stage - fieldwork

Goals:

- 1) Determination of carbon stocks at the beginning of the forecasting period for different forest ecosystem reservoirs in the FCF Project stands and in reference areas
- 2) Professionalization of the Canadian model (the research material will be used to develop equations considering Polish conditions)





Activities related to the collection of research material



Picking of thick roots



Sectional
measurement of
felled trees
Preparing trunks
for weighting
Labeling discs



Soil sampling

Basic Carbon Sample Plot (BCSP)
Sampling from forest cover and litter



Fieldwork includes , among others :

- **extended and updated stand description and inventories**
 - ✓ establishing the value of the stand characteristics which will allow the modeling of carbon stocks in different reservoirs
 - ✓ tree stands included in the FCF and reference areas
- **basic Carbon Sample Plot (BCSP) - selection of representative parts of stands for sampling of organic material**
 - ✓ soil exploration, different types of soil samples from different genetic levels
 - ✓ undergrowth - cutting and chipping
 - ✓ forest floor, litter (uniform grid of circle sample plots of 0,2 m²)
 - ✓ tree stand-sample trees (sectional measurements, determination of fresh biomass of all tree components, sampling for laboratory testing from the aboveground and underground parts of PKW, including dead roots)
 - ✓ securing and transporting the samples to the laboratory





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