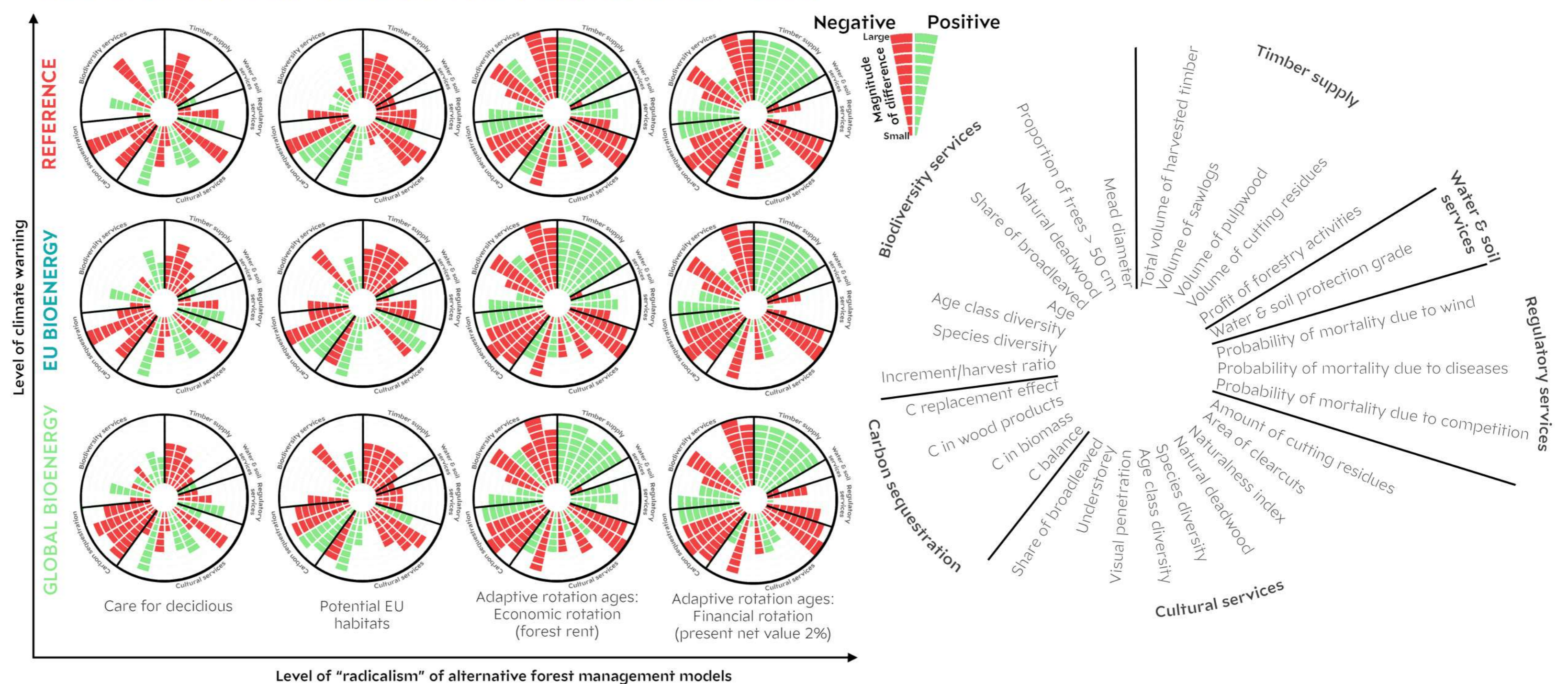




DEVELOPMENT OF A MODERN FOREST DECISION SUPPORT SYSTEM FOR LITHUANIA: SIMULATION OR OPTIMIZATION?

Forest ecosystems and forestry in Lithuania are encountering numerous challenges, including the increased use of timber and bioenergy, uncertainties stemming from climate change, the dynamics of evolving global markets, rural development, and growing public interest in the social values of forests. Effectively managing such a multifaceted system is only possible through the implementation of smart technologies, with a growing emphasis on forest decision support systems. Historically, forestry decision support in Lithuania has relied on forest growth and forestry simulators, such as Kupolis. The application of forest simulators typically involves modelling the future development of forest resources under various conditions and specifications that describe the behaviour of the forest and forest managers. This research aims to introduce a prototype of a modern forest decision support system that focuses on optimizing forest management alternatives to achieve specified long-term management objectives and constraints.

THE IMPACT OF ALTERNATIVE FOREST MANAGEMENT MODELS ON THE DELIVERY OF FOREST ECOSYSTEM SERVICES IN THE PERIOD 2020-2060



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GAYA – STAND PROJECTION SIMULATOR

GAYA is a tool for calculating the outcome of different management programs for basic forest entities. The results obtained through GAYA can be used as input to optimizers for finding solutions to forest planning problems of enterprises, landscapes or nations.

What concerns the input to GAYA, the basic forest entity in a register can be a stand, a plot or any other kind of unit whose development can be projected as a single unit under a treatment schedule.

EXAMPLES OF MANAGEMENT PROGRAMS

Stand	Treatment schedule	Treat Period	Age	Hgv	Stems	m ³ Vol	m ³ Dec	m ³ Harv	SCost	HCost	RCost
1 No01	1	1	106	23.7	194	261	261	0	0	0	0
1 No01	2	1	111	22.4	200	284	284	0	0	0	0
1 No01	3	1	116	25.1	204	307	307	0	0	0	0
1 No01	4	1	121	25.7	208	331	331	0	0	0	0
1 No02	1	1	106	23.7	194	261	261	0	0	0	0
1 No02	2	1	111	22.4	200	284	284	0	0	0	0
1 No02	3	1	116	25.1	204	307	307	0	0	0	0
1 No02	4	6	121	25.7	208	331	331	331	15726	30140	164

FUTURE PLANS

We are currently developing Decision Support Tools (DSTs) to assess forest management practice by modernizing the forestry modeling software GAYA. We plan to create an interface using Lithuanian data, to identify, create and integrate missing models, necessary for Lithuanian forestry.

ACKNOWLEDGMENTS

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THE SEQUENCE OF OPERATIONS REQUIRED FOR GAYA TO PRODUCE MANAGEMENT PROGRAMS

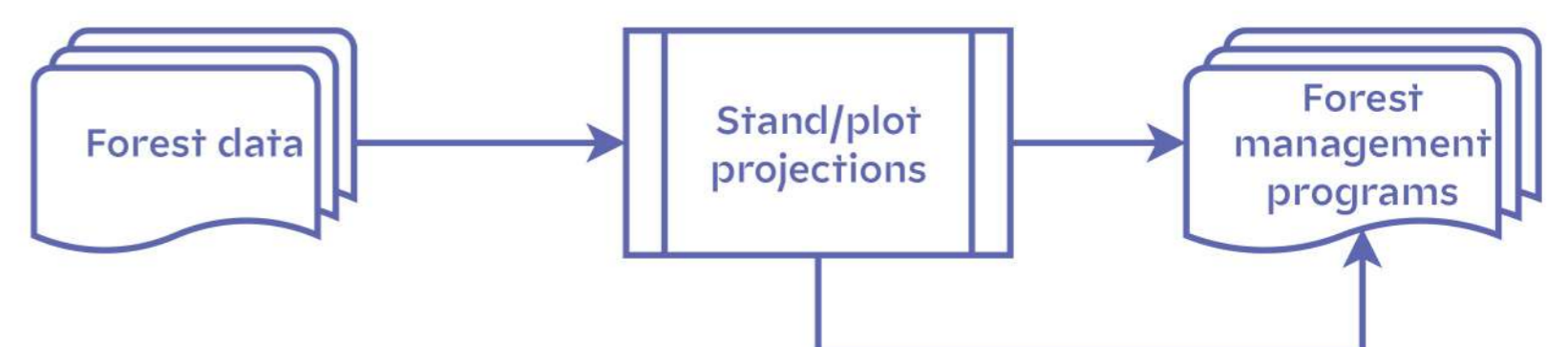


DIAGRAM OF HOW GAYA CREATES A PROJECTION FOR A SINGLE UNIT FOR ONE PERIOD

