IMWEBs Online Tool Design Document

By Shawn Prepared on July 8, 2019

# Statement of goals

The main goal is to develop an online GIS-based tool to 1) specify conservation program objectives and constraints, execute optimization model, and display prioritized BMP type and location; and 2) display current state results of a watershed.

# Functional description

* Transferrable to different watershed
* Support BMP extension (adding new BMP in the future for optimization)
* Display watershed related maps, e.g., watershed boundary, stream network, field (or Alberta Legal Subdivision, LSD) boundary
* Specify conservation program optimization objectives and constraints
* Support customizing available BMPs in one watershed
* Support multiple constraints (e.g., reduce TP more than 20% AND budget within $50,000)
* Execute optimization model
* Display multiple optimization results in a trade-off curve
* Support trade-off curve selection and updating BMP type in each farm field or LSD
* Display baseline watershed results
* Annual average outlet flow, sediment, DN, PN, TN, DP, PP, TP
* Annual average stream flow, sediment, DN, PN, TN, DP, PP, TP
* Annual average field or LSD surface runoff, erosion, soil moisture, groundwater recharge, DN, PN, TN, DP, PP, TP, carbon sequestration, and biodiversity
* Annual average watershed (raster) surface runoff, erosion, soil moisture, groundwater recharge, DN, PN, TN, DP, PP, TP

# Interface design

See appendix-1 for interface design.

# Milestones

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| Milestone | Description | Due date |
| 1 | Finish and agree on software design | Jul 19 (2 weeks) |
| 2 | Finish prototype for optimization | Aug 30 (6 weeks) |
| 3 | Finish local testing and debugging | Oct 11 (6 weeks) |
| 4 | Online testing | Oct 18 (1 week) |
| 5 | Development documents and system online (demo version) | Oct 31 (2 weeks) |
| 6 | Finish prototype for baseline watershed result display | Nov 29 (4 weeks) |