Quantification and Mapping of Satellite Driven Surface Energy Balance Fluxes in Semi-arid to Arid Inter-Mountain Region

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Supplement Material:

Table S1. Average seasonal crop evapotranspiration ETc, seasonal precipitation (P) and Irrigation contribution to ETc (ETc-P) for four major crops i.e. Sugar beet, Dry bean, Alfalfa, and Maize within Cody Canal Irrigation District for 2017 and 2018.

| Crop Type      | Year | Seasonal ETc (mm) | Seasonal P (mm) | ETc-P (mm) | % of irrigation contributing to ETc |
|----------------|------|-------------------|-----------------|------------|-----------------------------------|
| Cody Canal Irrigation District |      |                   |                 |            |                                   |
| Sugar beet     | 2017 | 657               | 158             | 499        | 76                                 |
|                | 2018 | 651               | 204             | 447        | 69                                 |
| Dry bean       | 2017 | 566               | 158             | 408        | 72                                 |
|                | 2018 | 529               | 204             | 325        | 61                                 |
| Alfalfa        | 2017 | 726               | 158             | 568        | 78                                 |
|                | 2018 | 683               | 204             | 479        | 70                                 |
| Maize          | 2017 | 675               | 158             | 517        | 77                                 |
|                | 2018 | 632               | 204             | 428        | 68                                 |

Table S2. Average seasonal crop evapotranspiration ETc, seasonal precipitation (P) and Irrigation contribution to ETc (ETc-P) for four major crops i.e. Sugar beet, Dry bean, Alfalfa, and Maize within Deaver Irrigation District for 2017 and 2018.
### Deaver Irrigation District

| Crop Type | Year | Seasonal ET<sub>c</sub> (mm) | Seasonal P (mm) | ET<sub>c</sub>-P (mm) | % of irrigation contributing to ET<sub>c</sub> |
|-----------|------|------------------------------|-----------------|----------------------|---------------------------------------------|
| Sugar beet | 2017 | 680                          | 117             | 563                  | 83                                          |
|           | 2018 | 664                          | 158.4           | 506                  | 76                                          |
| Dry bean  | 2017 | 516                          | 117             | 399                  | 77                                          |
|           | 2018 | 439                          | 158.4           | 281                  | 64                                          |
| Alfalfa   | 2017 | 680                          | 117             | 563                  | 83                                          |
|           | 2018 | 623                          | 158.4           | 464                  | 75                                          |
| Maize     | 2017 | 613                          | 117             | 496                  | 81                                          |
|           | 2018 | 599                          | 158.4           | 440                  | 74                                          |

Table S3. Average seasonal crop evapotranspiration ET<sub>c</sub>, seasonal precipitation (P) and Irrigation contribution to ET<sub>c</sub> (ET<sub>c</sub>-P) for four major crops i.e. Sugar beet, Dry bean, Alfalfa, and Maize within Greybull Valley Irrigation District for 2017 and 2018.

### Greybull Valley Irrigation District

| Crop Type | Year | Seasonal ET<sub>c</sub> (mm) | Seasonal P (mm) | ET<sub>c</sub>-P (mm) | % of irrigation contributing to ET<sub>c</sub> |
|-----------|------|------------------------------|-----------------|----------------------|---------------------------------------------|
| Sugar beet | 2017 | 593                          | 125             | 467                  | 79                                          |
|           | 2018 | 610                          | 162             | 448                  | 73                                          |
| Dry bean  | 2017 | 503                          | 125             | 377                  | 75                                          |
|           | 2018 | 479                          | 162             | 316                  | 66                                          |
| Alfalfa   | 2017 | 664                          | 125             | 538                  | 81                                          |
|           | 2018 | 633                          | 162             | 470                  | 74                                          |
| Maize     | 2017 | 563                          | 125             | 438                  | 78                                          |
|           | 2018 | 622                          | 162             | 459                  | 74                                          |

Table S4. Average seasonal crop evapotranspiration ET<sub>c</sub>, seasonal precipitation (P) and Irrigation contribution to ET<sub>c</sub> (ET<sub>c</sub>-P) for our major crops i.e. Sugar beet, Dry bean, Alfalfa, and Maize within Heart Mountain Irrigation District for 2017 and 2018.
| Crop Type     | Year | Seasonal ETc (mm) | Seasonal P (mm) | ETc-P (mm) | % of irrigation contributing to ETc |
|---------------|------|-------------------|----------------|------------|------------------------------------|
| Heart Mountain Irrigation District |      |                   |                |            |                                    |
| Sugar beet    | 2017 | 732               | 146.1          | 586        | 80                                 |
|               | 2018 | 673               | 196.9          | 476        | 71                                 |
| Dry bean      | 2017 | 529               | 146.1          | 383        | 72                                 |
|               | 2018 | 489               | 196.9          | 292        | 60                                 |
| Alfalfa       | 2017 | 761               | 146.1          | 615        | 81                                 |
|               | 2018 | 711               | 196.9          | 514        | 72                                 |
| Maize         | 2017 | 659               | 146.1          | 513        | 78                                 |
|               | 2018 | 683               | 196.9          | 486        | 71                                 |

Table S5. Average seasonal crop evapotranspiration ETc, seasonal precipitation (P) and Irrigation contribution to ETc (ETc-P) for four major crops i.e. Sugar beet, Dry bean, Alfalfa, and Maize within Hunt & Godfrey Irrigation District for 2017 and 2018.

| Crop Type     | Year | Seasonal ETc (mm) | Seasonal P (mm) | ETc-P (mm) | % of irrigation contributing to ETc |
|---------------|------|-------------------|----------------|------------|------------------------------------|
| Hunt & Godfrey Irrigation District |      |                   |                |            |                                    |
| Sugar beet    | 2017 | 643               | 124            | 519        | 81                                 |
|               | 2018 | 561               | 177            | 384        | 68                                 |
| Dry bean      | 2017 | 601               | 124            | 477        | 79                                 |
|               | 2018 | 494               | 177            | 316        | 64                                 |
| Alfalfa       | 2017 | 747               | 124            | 623        | 83                                 |
|               | 2018 | 687               | 177            | 510        | 74                                 |
| Maize         | 2017 | 684               | 124            | 560        | 82                                 |
|               | 2018 | 595               | 177            | 417        | 70                                 |

Table S6. Average seasonal crop evapotranspiration ETc, seasonal precipitation (P) and Irrigation contribution to ETc (ETc-P) for four major crops i.e. Sugar beet, Dry bean, Alfalfa, and Maize within Lovell Irrigation District for 2017 and 2018.
| Crop Type | Year | Seasonal ET<sub>c</sub> (mm) | Seasonal P (mm) | ET<sub>c</sub>-P (mm) | % of irrigation contributing to ET<sub>c</sub> |
|-----------|------|-----------------------------|-----------------|---------------------|--------------------------------------------|
| Lovell Irrigation District |
| Sugar beet | 2017 | 602 | 121.1 | 481 | 80 |
| 2018 | 620 | 164.4 | 456 | 73 |
| Dry bean | 2017 | 579 | 121.1 | 458 | 79 |
| 2018 | 554 | 164.4 | 389 | 70 |
| Alfalfa | 2017 | 734 | 121.1 | 613 | 83 |
| 2018 | 675 | 164.4 | 510 | 76 |
| Maize | 2017 | 630 | 121.1 | 509 | 81 |
| 2018 | 607 | 164.4 | 443 | 73 |

Table S7. Average seasonal crop evapotranspiration ET<sub>c</sub>, seasonal precipitation (P) and Irrigation contribution to ET<sub>c</sub> (ET<sub>c</sub>-P) for four major crops i.e. Sugar beet, Dry bean, Alfalfa, and Maize within Shoshone Irrigation District for 2017 and 2018.

| Crop Type | Year | Seasonal ET<sub>c</sub> (mm) | Seasonal P (mm) | ET<sub>c</sub>-P (mm) | % of irrigation contributing to ET<sub>c</sub> |
|-----------|------|-----------------------------|-----------------|---------------------|--------------------------------------------|
| Shoshone Irrigation District |
| Sugar beet | 2017 | 638 | 125 | 512 | 80 |
| 2018 | 645 | 167 | 478 | 74 |
| Dry bean | 2017 | 493 | 125 | 367 | 75 |
| 2018 | 484 | 167 | 317 | 65 |
| Alfalfa | 2017 | 677 | 125 | 552 | 81 |
| 2018 | 665 | 167 | 498 | 75 |
| Maize | 2017 | 565 | 125 | 439 | 78 |
| 2018 | 676 | 167 | 508 | 75 |

Table S8. Average seasonal crop evapotranspiration ET<sub>c</sub>, seasonal precipitation (P) and Irrigation contribution to ET<sub>c</sub> (ET<sub>c</sub>-P) for four major crops i.e. Sugar beet, Dry bean, Alfalfa, and Maize within Sidon Irrigation District for 2017 and 2018.
| Crop Type | Year | Seasonal ET<sub>c</sub> (mm) | Seasonal P (mm) | ET<sub>c</sub>-P (mm) | % of irrigation contributing to ET<sub>c</sub> |
|-----------|------|-----------------------------|----------------|----------------------|------------------------------------------|
| **Sidon Irrigation District** | | | | | |
| Sugar beet | 2017 | 632 | 121.1 | 511 | 81 |
| | 2018 | 637 | 151.2 | 485 | 76 |
| Dry bean | 2017 | 530 | 121.1 | 408 | 77 |
| | 2018 | 529 | 151.2 | 378 | 71 |
| Alfalfa | 2017 | 663 | 121.1 | 542 | 82 |
| | 2018 | 652 | 151.2 | 501 | 77 |
| Maize | 2017 | 635 | 121.1 | 514 | 81 |
| | 2018 | 617 | 151.2 | 466 | 76 |

Table S9. Average seasonal crop evapotranspiration ET<sub>c</sub>, seasonal precipitation (P) and Irrigation contribution to ET<sub>c</sub> (ET<sub>c</sub>-P) for four major crops i.e. Sugar beet, Dry bean, Alfalfa, and Maize within Will Wood Irrigation District for 2017 and 2018.

| Crop Type | Year | Seasonal ET<sub>c</sub> (mm) | Seasonal P (mm) | ET<sub>c</sub>-P (mm) | % of irrigation contributing to ET<sub>c</sub> |
|-----------|------|-----------------------------|----------------|----------------------|------------------------------------------|
| **Will Wood Irrigation District** | | | | | |
| Sugar beet | 2017 | 641 | 124 | 516 | 81 |
| | 2018 | 698 | 153 | 545 | 78 |
| Dry bean | 2017 | 537 | 124 | 413 | 77 |
| | 2018 | 534 | 153 | 381 | 71 |
| Alfalfa | 2017 | 692 | 124 | 568 | 82 |
| | 2018 | 691 | 153 | 538 | 78 |
| Maize | 2017 | 625 | 124 | 501 | 80 |
| | 2018 | 712 | 153 | 559 | 78 |