CLAIMS

1. A forecasting platform for generating a series of short period wind speed (SPWS) forecasts for a local area, the platform comprising:

(a) a scheduling module,

(i) wherein the scheduling module is configured to trigger the generation of the series of SPWS forecasts according to a forecast schedule with a plurality of forecast requests, each SPWS forecast associated with one of the forecast requests; and

(ii) wherein each forecast request includes a forecast identifier, a forecast time window, a forecast member selection list, and a forecast area identifier;

(b) a collection module,

(i) wherein the collection module is in data communication through a network with:

(1) at least one ensemble member server including a plurality of ensemble members configured for generation of member outputs; and

(2) a wind speed (WS) observation system for the local area configured to collect a series of observed WS records for the local area, each WS record including an observation area identifier, an observation time window, and WS observation information;

(ii) wherein, for each forecast request, the collection module is configured to store or link to a set of selected member outputs of the forecast request, each selected member output associated with:

(1) the forecast time window of the forecast request;

(2) one of the ensemble members identified in the forecast member selection list of the forecast request; and

(3) the forecast area identifier of the forecast request; and

(iii) wherein computations generating each selected member output from the ensemble member associated with the selected member output:

(1) generate WS forecast information for the selected member output; and

(2) are performed by at least one of the at least one ensemble member server, the platform, and a third party remote computing service;

(c) a pre-processing module configured to, for each forecast request, identify and extract the WS forecast information from each of the selected member outputs of the forecast request;

(d) a forecast history database,

(i) wherein the forecast history database is configured to store a plurality of forecast records memorializing each of the SPWS forecasts outputted from a plurality of prior forecast requests; and

(ii) wherein the forecast record associated with each prior forecast request stores or links to:

(1) the forecast identifier of the prior forecast request;

(2) the forecast area identifier of the prior forecast request;

(3) the forecast member selection list of the prior forecast request;

(4) the set of selected member outputs for the prior forecast request; and

(5) the WS forecast information from each of the selected member outputs of the prior forecast request;

(e) a ranking module configured, for each forecast request, to:

(i) select and access:

(1) at least one sample forecast record from the plurality of forecast records of the prior forecast requests stored in the forecast history database; and

(2) at least one concurrent observed WS record,

(a) wherein the forecast area identifier of the at least one sample forecast record and the observation area identifier of the concurrent observed WS record both identify a first identical or overlapping geographic area; and

(b) wherein the observation time window of the at least one concurrent observed WS record overlap at least partially with the forecast time window of the at least one sample forecast record; and

(ii) calculate a forecast member accuracy ranking for each of the ensemble members in the forecast member selection list of the at least one sample forecast record, wherein the forecast member accuracy ranking for each ensemble member of the at least one sample forecast record is derived from an accuracy error between:

(1) the WS forecast information from the selected member output associated with the ensemble member of the at least one sample forecast record; and

(2) the WS observation information for the at least one concurrent observed WS record;

(f) a forecasting module, the forecasting module configured to:

(i) determine an optimal grouping of the selected member outputs for the forecast request based on the forecast member accuracy ranking of each of the ensemble members of the at least one sample forecast record; and

(ii) generate the SPWS forecast for the forecast request based on a weighted average of the optimal grouping of the selected member outputs for the forecast request; and

(g) an output module configured, for each forecast request, to:

(i) output the SPWS forecast of the forecast request to a user interface; and

(ii) augment the forecast history database with a new forecast record detailing the SPWS forecast generated for the forecast request.

2. The platform of claim 1, wherein, for each forecast request, the plurality of WS clusters include:

(a) a low WS cluster;

(b) a medium WS cluster;

(c) a high WS cluster; and

(d) an average WS cluster.

3. The platform of claim 1,

(a) wherein each of the ensemble members are exchangeable; and

(b) wherein the plurality of ensemble members include at least one of:

(i) a plurality of ECMWF EPS ensemble members; and

(ii) a plurality of down-scaled NWP ensemble members.

4. The platform of claim 1, wherein the forecast duration of the forecast time window is in the range of 1 to 6 hours and ends at the forecast start time.

5. The platform of claim 1, wherein calculations for the accuracy error include at least one of a root mean square error, a mean bias error, a standard deviation, a mean, a maximum, and a minimum.

6. The platform of claim 1,

(a) wherein the output module is in data communication through the network with a utility company server receiving generated wind power from the local area; and

(b) wherein the output module is configured to deliver the SPWS forecast to the utility company server through the network.

7. The platform of claim 1, wherein the forecast time window of the prior forecast request of the at least one sample forecast record overlaps at least partially with at least one of:

(a) a previous calendar day from the forecast time window of the forecast request; and

(b) a previous time of calendar day as the forecast time window of the forecast request.

8. The platform of claim 1, wherein the forecast area identifier of the at least one sample forecast record and the forecast identifier of the forecast request both identify a second identical or overlapping geographic area.

9. A computer-implemented forecasting method for generating a series of short period wind speed (SPWS) forecasts for a local area, the method comprising:

(a) maintaining a scheduling module,

(i) wherein the scheduling module is configured to trigger the generation of the series of SPWS forecasts according to a forecast schedule with a plurality of forecast requests, each SPWS forecast associated with one of the forecast requests; and

(ii) wherein each forecast request includes a forecast identifier, a forecast time window, a forecast member selection list, and a forecast area identifier;

(b) maintaining a collection module,

(i) wherein the collection module is in data communication through a network with:

(1) at least one ensemble member server including a plurality of ensemble members configured for generation of member outputs; and

(2) a wind speed (WS) observation system for the local area configured to collect a series of observed WS records for the local area, each WS record including an observation area identifier, an observation time window, and WS observation information;

(ii) wherein, for each forecast request, the collection module is configured to store or link to a set of selected member outputs of the forecast request, each selected member output associated with:

(1) the forecast time window of the forecast request;

(2) one of the ensemble members identified in the forecast member selection list of the forecast request; and

(3) the forecast area identifier of the forecast request; and

(iii) wherein computations generating each selected member output from the ensemble member associated with the selected member output:

(3) generate WS forecast information for the selected member output; and

(4) are performed by at least one of the at least one ensemble member server, the platform, and a third party remote computing service;

(c) maintaining a pre-processing module configured to, for each forecast request, identify and extract the WS forecast information from each of the selected member outputs of the forecast request;

(d) maintaining a forecast history database,

(i) wherein the forecast history database is configured to store a plurality of forecast records memorializing each of the SPWS forecasts outputted from a plurality of prior forecast requests; and

(ii) wherein the forecast record associated with each prior forecast request stores or links to:

(1) the forecast identifier of the prior forecast request;

(2) the forecast area identifier of the prior forecast request;

(3) the forecast member selection list of the prior forecast request;

(4) the set of selected member outputs for the prior forecast request; and

(5) the WS forecast information from each of the selected member outputs of the prior forecast request;

(e) for each forecast request, selecting and accessing:

(i) at least one sample forecast record from the plurality of forecast records of the prior forecast requests stored in the forecast history database; and

(ii) at least one concurrent observed WS record,

(1) wherein the forecast area identifier of the at least one sample forecast record and the observation area identifier of the concurrent observed WS record both identify a first identical or overlapping geographic area; and

(2) wherein the observation time window of the at least one concurrent observed WS record overlap at least partially with the forecast time window of the at least one sample forecast record;

(f) for each forecast request, calculating a forecast member accuracy ranking for each of the ensemble members in the forecast member selection list of the at least one sample forecast record, wherein the forecast member accuracy ranking for each ensemble member of the at least one sample forecast record is derived from an accuracy error between:

(i) the WS forecast information from the selected member output associated with the ensemble member of the at least one sample forecast record; and

(ii) the WS observation information for the at least one concurrent observed WS record;

(g) for each forecast request, determining an optimal grouping of the selected member outputs for the forecast request based on the forecast member accuracy ranking of each of the ensemble members of the at least one sample forecast record;

(h) for each forecast request, generating the SPWS forecast for the forecast request based on a weighted average of the optimal grouping of the selected member outputs for the forecast request;

(i) for each forecast request, outputting the SPWS forecast of the forecast request to a user interface; and

(j) for each forecast request, augmenting the forecast history database with a new forecast record detailing the SPWS forecast generated for the forecast request.

10. The method of claim 9, wherein, for each forecast request, the plurality of WS clusters include:

(a) a low WS cluster;

(b) a medium WS cluster;

(c) a high WS cluster; and

(d) an average WS cluster.

11. The method of claim 9,

(a) wherein each of the ensemble members are exchangeable; and

(b) wherein the plurality of ensemble members include at least one of:

(i) a plurality of ECMWF EPS ensemble members; and

(ii) a plurality of down-scaled NWP ensemble members.

12. The method of claim 9, wherein the forecast duration of the forecast time window is in the range of 1 to 6 hours and ends at the forecast start time.

13. The method of claim 9, wherein calculations for the accuracy error include at least one of a root mean square error, a mean bias error, a standard deviation, a mean, a maximum, and a minimum.

14. The method of claim 9, the method further comprising the steps of:

(a) establishing a data communication link through the network with a utility company server receiving generated wind power from the local area; and

(b) delivering the SPWS forecast to the utility company server through the network.

15. The ~~platform~~ method of claim 9, wherein the forecast time window of the prior forecast request of the at least one sample forecast record overlaps at least partially with at least one of:

(a) a previous calendar day from the forecast time window of the forecast request; and

(b) a previous time of calendar day as the forecast time window of the forecast request.

16. The ~~platform~~ method of claim 9, wherein the forecast area identifier of the at least one sample forecast record and the forecast identifier of the forecast request both identify a second identical or overlapping geographic area.